Capstone - Toronto DineSafe Inspections

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November 8, 2016

Step 1: Load the data from the DineSafe inspection database. The data was sourced in XML format.

```
## Create a dataframe from the XML data.
library("XML")
```

```
## Warning: package 'XML' was built under R version 3.3.1
```

```
dinesafe.tmp <- "C:/Users/Jenn & Dave/Documents/Capstone/dinesafe.Sept17.xml"
dinesafe <- xmlTreeParse(dinesafe.tmp)
class(dinesafe)
```

```
## [1] "XMLDocument"         "XMLAbstractDocument"
```

```
xmltop <- xmlRoot(dinesafe)
inspections <- xmlSApply(xmltop, function(x) xmlSApply(x, xmlValue))
inspect_df <- data.frame(t(inspections),row.names=NULL)
```

Step 2: Label the columns and set them to the appropriate data types.

```
## Organize inspection data.
colnames(inspect_df)
```

```
##  [1] "ROW_ID"                    "ESTABLISHMENT_ID"
##  [3] "INSPECTION_ID"             "ESTABLISHMENT_NAME"
##  [5] "ESTABLISHMENTTYPE"         "ESTABLISHMENT_ADDRESS"
##  [7] "ESTABLISHMENT_STATUS"      "MINIMUM_INSPECTIONS_PERYEAR"
##  [9] "INFRACTION_DETAILS"        "INSPECTION_DATE"
## [11] "SEVERITY"                  "ACTION"
## [13] "COURT_OUTCOME"             "AMOUNT_FINED"
```

```
inspect_df$ROW_ID <- as.numeric(inspect_df$ROW_ID)
inspect_df$ESTABLISHMENT_ID <- as.numeric(inspect_df$ESTABLISHMENT_ID)
inspect_df$ESTABLISHMENT_ID <- as.factor(inspect_df$ESTABLISHMENT_ID)
inspect_df$INSPECTION_ID <- as.numeric(inspect_df$INSPECTION_ID)
inspect_df$ESTABLISHMENT_NAME <- as.character(inspect_df$ESTABLISHMENT_NAME)
inspect_df$ESTABLISHMENTTYPE <- as.character(inspect_df$ESTABLISHMENTTYPE)
inspect_df$ESTABLISHMENTTYPE <- as.factor(inspect_df$ESTABLISHMENTTYPE)
inspect_df$ESTABLISHMENT_ADDRESS <- as.character(inspect_df$ESTABLISHMENT_ADDRESS)
inspect_df$ESTABLISHMENT_ADDRESS <- as.factor(inspect_df$ESTABLISHMENT_ADDRESS)
inspect_df$ESTABLISHMENT_STATUS <- as.character(inspect_df$ESTABLISHMENT_STATUS)
inspect_df$ESTABLISHMENT_STATUS <- as.factor(inspect_df$ESTABLISHMENT_STATUS)
inspect_df$MINIMUM_INSPECTIONS_PERYEAR <- as.numeric(inspect_df$MINIMUM_INSPECTIONS_PE
RYEAR)
inspect_df$MINIMUM_INSPECTIONS_PERYEAR <- as.factor(inspect_df$MINIMUM_INSPECTIONS_PER
YEAR)
inspect_df$INFRACTION_DETAILS <- as.character(inspect_df$INFRACTION_DETAILS)
inspect_df$INFRACTION_DETAILS <- as.factor(inspect_df$INFRACTION_DETAILS)
inspect_df$INSPECTION_DATE <- as.character(inspect_df$INSPECTION_DATE)
inspect_df$INSPECTION_DATE <- as.Date(inspect_df$INSPECTION_DATE)
inspect_df$SEVERITY <- as.character(inspect_df$SEVERITY)
inspect_df$SEVERITY <- as.factor(inspect_df$SEVERITY)
inspect_df$ACTION <- as.character(inspect_df$ACTION)
inspect_df$ACTION <- as.factor(inspect_df$ACTION)
inspect_df$COURT_OUTCOME <- as.character(inspect_df$COURT_OUTCOME)
inspect_df$COURT_OUTCOME <- as.factor(inspect_df$COURT_OUTCOME)
inspect_df$AMOUNT_FINED <- as.numeric(inspect_df$AMOUNT_FINED)

## View a sample of the data.
head(inspect_df)
```

```
##   ROW_ID ESTABLISHMENT_ID INSPECTION_ID           ESTABLISHMENT_NAME
## 1      1          1222579     103329697 SAI-LILA KHAMAN DHOKLA HOUSE
## 2      2          1222579     103329697 SAI-LILA KHAMAN DHOKLA HOUSE
## 3      3          1222579     103329697 SAI-LILA KHAMAN DHOKLA HOUSE
## 4      4          1222579     103329697 SAI-LILA KHAMAN DHOKLA HOUSE
## 5      5          1222579     103329697 SAI-LILA KHAMAN DHOKLA HOUSE
## 6      6          1222579     103420091 SAI-LILA KHAMAN DHOKLA HOUSE
##   ESTABLISHMENTTYPE ESTABLISHMENT_ADDRESS ESTABLISHMENT_STATUS
## 1     Food Take Out        870 MARKHAM RD                 Pass
## 2     Food Take Out        870 MARKHAM RD                 Pass
## 3     Food Take Out        870 MARKHAM RD                 Pass
## 4     Food Take Out        870 MARKHAM RD                 Pass
## 5     Food Take Out        870 MARKHAM RD                 Pass
## 6     Food Take Out        870 MARKHAM RD                 Pass
##   MINIMUM_INSPECTIONS_PERYEAR
## 1                           2
## 2                           2
## 3                           2
## 4                           2
## 5                           2
## 6                           2
##                                                    INFRACTION_DETAILS
## 1 FAIL TO PROVIDE TOWELS IN FOOD PREPARATION AREA O. REG  562/90 SEC. 20(1)(C)
## 2                                  Operator fail to properly maintain rooms
## 3                                  Operator fail to properly wash equipment
## 4                           Operator fail to properly wash surfaces in rooms
## 5                    Operator fail to sanitize garbage containers as required
## 6                                  Operator fail to properly wash equipment
##   INSPECTION_DATE        SEVERITY                     ACTION
## 1      2014-09-09 S - Significant Corrected During Inspection
## 2      2014-09-09       M - Minor            Notice to Comply
## 3      2014-09-09       M - Minor            Notice to Comply
## 4      2014-09-09       M - Minor            Notice to Comply
## 5      2014-09-09       M - Minor            Notice to Comply
## 6      2015-01-08       M - Minor            Notice to Comply
##   COURT_OUTCOME AMOUNT_FINED
## 1  character(0)           NA
## 2  character(0)           NA
## 3  character(0)           NA
## 4  character(0)           NA
## 5  character(0)           NA
## 6  character(0)           NA
```

Step 3: Create a list of all unique inspection IDs.

```
sub_insp <- subset(inspect_df,select = c(ESTABLISHMENT_ID:MINIMUM_INSPECTIONS_PERYEAR,
INSPECTION_DATE))
inspect_unique <- unique(sub_insp)

head(inspect_unique)
```

```
##    ESTABLISHMENT_ID INSPECTION_ID           ESTABLISHMENT_NAME
## 1           1222579     103329697 SAI-LILA KHAMAN DHOKLA HOUSE
## 6           1222579     103420091 SAI-LILA KHAMAN DHOKLA HOUSE
## 9           1222580     103490157  OYINGBO AFRICAN SUPERMARKET
## 10          1222580     103601595  OYINGBO AFRICAN SUPERMARKET
## 11          1222807     103355310                   PHO BO TO
## 12          1222807     103472815                   PHO BO TO
##    ESTABLISHMENTTYPE ESTABLISHMENT_ADDRESS ESTABLISHMENT_STATUS
## 1      Food Take Out        870 MARKHAM RD                 Pass
## 6      Food Take Out        870 MARKHAM RD                 Pass
## 9        Supermarket          1550 JANE ST                 Pass
## 10       Supermarket          1550 JANE ST                 Pass
## 11        Restaurant   1635 LAWRENCE AVE W                 Pass
## 12        Restaurant   1635 LAWRENCE AVE W                 Pass
##    MINIMUM_INSPECTIONS_PERYEAR INSPECTION_DATE
## 1                            2      2014-09-09
## 6                            2      2015-01-08
## 9                            1      2015-05-12
## 10                           1      2015-11-02
## 11                           3      2014-11-05
## 12                           3      2015-04-23
```

Step 4: Create a list of inspection IDs that resulted in either Significant (S) or Crucial (C) severity.

```
inspect_SevCru <- inspect_df[inspect_df$SEVERITY %in% c("C - Crucial","S - Significant
"),3]

## Flag each of the unique inspections based on whether it resulted in a Significant o
r Crucial violation.
Sev_Cru <- vector()
for (i in 1:length(inspect_unique$INSPECTION_ID)){
  if (inspect_unique$INSPECTION_ID[i] %in% inspect_SevCru){
    Sev_Cru[i] <- T}
  else{
    Sev_Cru[i] <- F }}

## Bind the unique inspection records with the Severity indicator.
inspect_work <- as.data.frame(cbind(inspect_unique, Sev_Cru))

head(inspect_work)
```

```
##    ESTABLISHMENT_ID INSPECTION_ID           ESTABLISHMENT_NAME
## 1           1222579     103329697 SAI-LILA KHAMAN DHOKLA HOUSE
## 6           1222579     103420091 SAI-LILA KHAMAN DHOKLA HOUSE
## 9           1222580     103490157  OYINGBO AFRICAN SUPERMARKET
## 10          1222580     103601595  OYINGBO AFRICAN SUPERMARKET
## 11          1222807     103355310                   PHO BO TO
## 12          1222807     103472815                   PHO BO TO
##    ESTABLISHMENTTYPE ESTABLISHMENT_ADDRESS ESTABLISHMENT_STATUS
## 1      Food Take Out        870 MARKHAM RD                 Pass
## 6      Food Take Out        870 MARKHAM RD                 Pass
## 9        Supermarket          1550 JANE ST                 Pass
## 10       Supermarket          1550 JANE ST                 Pass
## 11        Restaurant   1635 LAWRENCE AVE W                 Pass
## 12        Restaurant   1635 LAWRENCE AVE W                 Pass
##    MINIMUM_INSPECTIONS_PERYEAR INSPECTION_DATE Sev_Cru
## 1                            2      2014-09-09    TRUE
## 6                            2      2015-01-08    TRUE
## 9                            1      2015-05-12   FALSE
## 10                           1      2015-11-02   FALSE
## 11                           3      2014-11-05   FALSE
## 12                           3      2015-04-23   FALSE
```

We now have a list of unique inspections, flagged for whether or not they resulted in a Crucial or Significant violation.

Step 5: Add another potential explanatory variable: Month. This is a plausible variable, because there may be seasonal factors driving the inspection results.

```
inspect_work$MONTH <- months(inspect_work$INSPECTION_DATE)
```

Step 6a: Check for complete cases:

```
cc_test <- complete.cases(inspect_work)
length(which(cc_test == F))
```

```
## [1] 0
```

Result: It appears that there are no incomplete cases in the remaining data.

Step 6b: Preliminary data analysis:

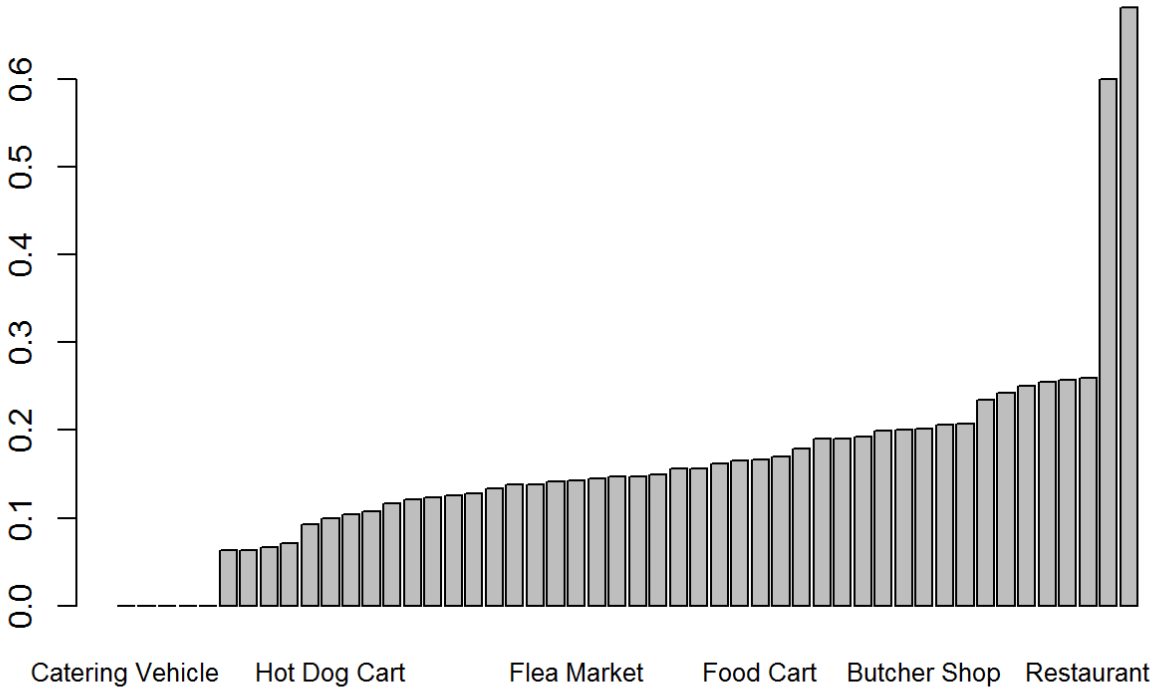
```
## Percentage of inspections resulting in a Significant or Crucial Health Violation.
nrow(inspect_work[Sev_Cru == 1,])/nrow(inspect_work)
```

```
## [1] 0.2190404
```

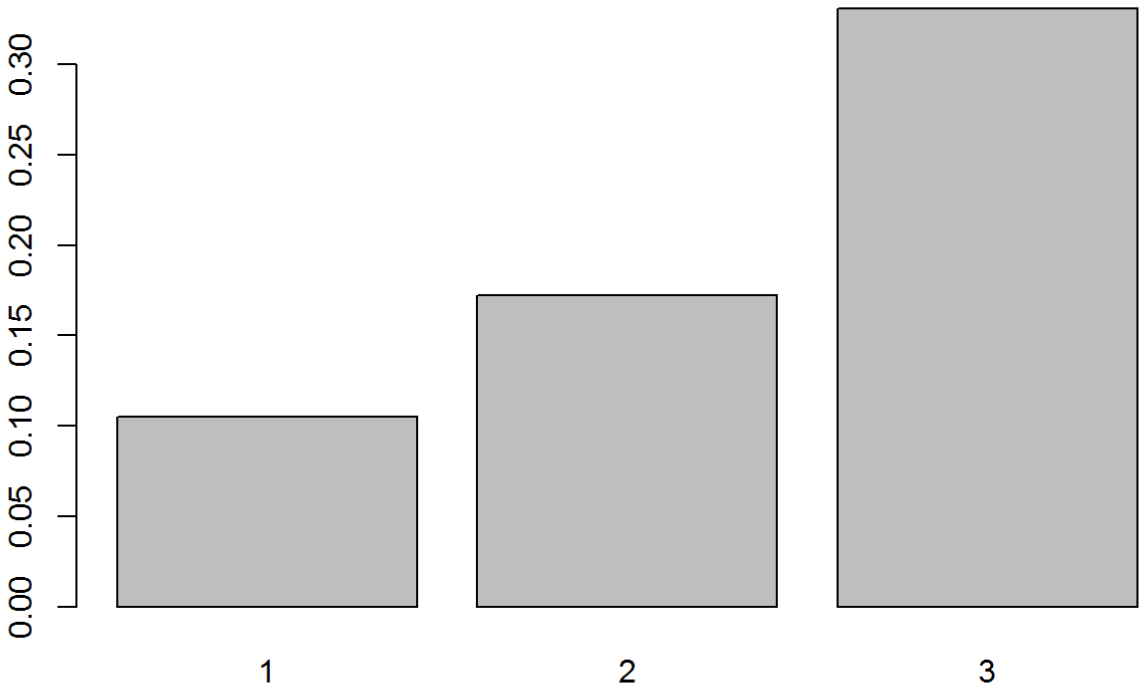
Result: Approximately 22% of inspections resulted in a Significant or Crucial Health Violation.

Step 6c: Next, we will visualize the percentage of significant / crucial violations across the following categorical variables:

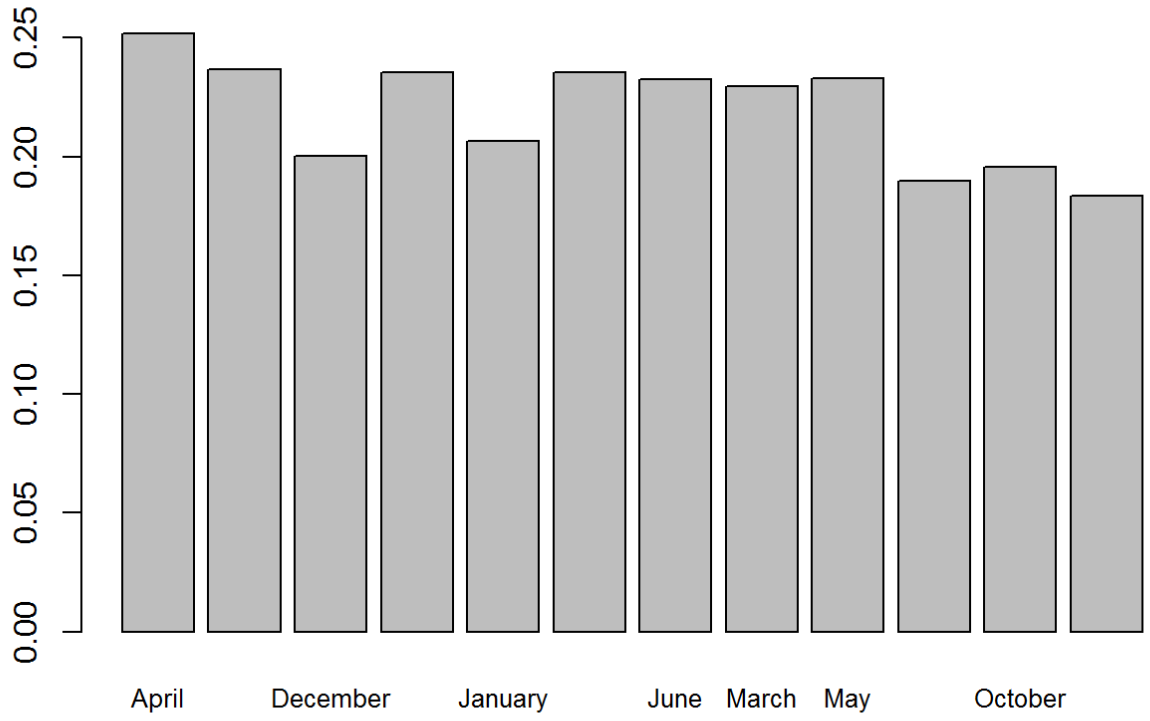
```
## (i) Establishment Type
barplot(sort(table(inspect_work[Sev_Cru == 1,]$ESTABLISHMENTTYPE)/table(inspect_work$E
STABLISHMENTTYPE), decreasing = F), cex.names = 0.8)
```




```
## (ii) Minimum Inspections per Year
barplot(table(inspect_work[Sev_Cru == 1,]$MINIMUM_INSPECTIONS_PERYEAR)/table(inspect_w
ork$MINIMUM_INSPECTIONS_PERYEAR))
```




```
## (iii) Month of Inspection
barplot(table(inspect_work[Sev_Cru == 1,]$MONTH)/table(inspect_work$MONTH), cex.names
= 0.8)
```



Results: (i) The appears to be some disparity in the rate of violations across Establishment Type. (ii) Interestingly, the establisments that require 3 inspections per year also showed the highest incidence of Significant and Critical health violations. This makes intuitive sense, given that these are typically higher risk establishments. (iii) There does appear to be some variation in the incidence of violations by month.

Step 7: Begin creating a logistic regression to evaluate the explanatory value of different variables on Significant and Crucial violations.

```
glm_insp <- glm(Sev_Cru~ESTABLISHMENTTYPE+MINIMUM_INSPECTIONS_PERYEAR+MONTH,data = ins
pect_work, family = binomial("logit"))

summary(glm_insp)
```

```
##
## Call:
## glm(formula = Sev_Cru ~ ESTABLISHMENTTYPE + MINIMUM_INSPECTIONS_PERYEAR +
##     MONTH, family = binomial("logit"), data = inspect_work)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -1.9963  -0.6779  -0.5948  -0.3484   2.9542
##
## Coefficients:
##                                                    Estimate
## (Intercept)                                      -2.174337
## ESTABLISHMENTTYPEBakery                           0.257050
## ESTABLISHMENTTYPEBanquet Facility                -0.602368
## ESTABLISHMENTTYPEBoarding / Lodging Home - Kitchen -1.188018
## ESTABLISHMENTTYPEBottling Plant                   2.136144
## ESTABLISHMENTTYPEBowling Alley                    0.427415
## ESTABLISHMENTTYPEButcher Shop                     0.139259
## ESTABLISHMENTTYPECafeteria - Public Access       -0.341969
## ESTABLISHMENTTYPECatering Vehicle               -10.543101
## ESTABLISHMENTTYPEChartered Cruise Boats           2.235351
## ESTABLISHMENTTYPECheese Plant                   -10.953510
## ESTABLISHMENTTYPEChild Care - Catered            -1.282921
## ESTABLISHMENTTYPEChild Care - Food Preparation   -1.868904
## ESTABLISHMENTTYPEChurch Banquet Facility         -0.936985
## ESTABLISHMENTTYPECocktail Bar / Beverage Room     0.531173
## ESTABLISHMENTTYPECollege/University Food services -0.399239
## ESTABLISHMENTTYPECommissary                      -0.452839
## ESTABLISHMENTTYPECommunity Kitchen Meal Program  -0.083053
## ESTABLISHMENTTYPEElementary School Food services -0.249702
## ESTABLISHMENTTYPEFish Shop                       -0.533347
## ESTABLISHMENTTYPEFlea Market                     -0.206009
## ESTABLISHMENTTYPEFood Bank                       -0.151037
## ESTABLISHMENTTYPEFood Cart                        0.235669
## ESTABLISHMENTTYPEFood Caterer                    -0.705050
## ESTABLISHMENTTYPEFood Court Vendor                0.148714
## ESTABLISHMENTTYPEFood Depot                       0.033138
## ESTABLISHMENTTYPEFood Processing Plant            0.153278
## ESTABLISHMENTTYPEFood Store (Convenience / Variety) 0.255479
## ESTABLISHMENTTYPEFood Take Out                    0.036502
## ESTABLISHMENTTYPEFood Vending Facility           -0.517084
## ESTABLISHMENTTYPEHospitals & Health Facilities   -1.329356
## ESTABLISHMENTTYPEHot Dog Cart                    -0.336143
## ESTABLISHMENTTYPEIce Cream / Yogurt Vendors      -0.148392
## ESTABLISHMENTTYPEIce Cream Plant                 -10.294392
## ESTABLISHMENTTYPEInstitutional Food Service      -0.872373
## ESTABLISHMENTTYPELocker Plant                    -10.257373
## ESTABLISHMENTTYPEMeat Processing Plant           -0.204342
## ESTABLISHMENTTYPEMilk Pasteurization Plant       -11.927415
## ESTABLISHMENTTYPEMobile Food Preparation Premises -1.045349
```

```
## ESTABLISHMENTTYPENursing Home / Home for the Aged          -1.144225
## ESTABLISHMENTTYPEOther Educational Facility Food Services   0.234649
## ESTABLISHMENTTYPERefreshment Stand (Stationary)             0.134463
## ESTABLISHMENTTYPERest Home                                 -0.154586
## ESTABLISHMENTTYPERestaurant                                 0.111845
## ESTABLISHMENTTYPERetirement Homes(Licensed)                -1.105787
## ESTABLISHMENTTYPERetirement Homes(Un-licensed)             -1.288893
## ESTABLISHMENTTYPESchool Nourishment Program                -0.186127
## ESTABLISHMENTTYPESecondary School Food Services            -0.409506
## ESTABLISHMENTTYPEServing Kitchen                           -0.728034
## ESTABLISHMENTTYPESupermarket                                0.327725
## MINIMUM_INSPECTIONS_PERYEAR2                                0.678981
## MINIMUM_INSPECTIONS_PERYEAR3                                1.683287
## MONTHAugust                                                -0.248495
## MONTHDecember                                              -0.193950
## MONTHFebruary                                               0.002756
## MONTHJanuary                                               -0.140875
## MONTHJuly                                                  -0.157354
## MONTHJune                                                   0.101662
## MONTHMarch                                                 -0.111610
## MONTHMay                                                    0.082750
## MONTHNovember                                              -0.307721
## MONTHOctober                                               -0.200114
## MONTHSeptember                                             -0.259043
##                                                          Std. Error
## (Intercept)                                                 0.242021
## ESTABLISHMENTTYPEBakery                                     0.244131
## ESTABLISHMENTTYPEBanquet Facility                           0.262920
## ESTABLISHMENTTYPEBoarding / Lodging Home - Kitchen          0.293332
## ESTABLISHMENTTYPEBottling Plant                             0.956956
## ESTABLISHMENTTYPEBowling Alley                              1.153266
## ESTABLISHMENTTYPEButcher Shop                               0.257044
## ESTABLISHMENTTYPECafeteria - Public Access                  0.278305
## ESTABLISHMENTTYPECatering Vehicle                         144.132276
## ESTABLISHMENTTYPEChartered Cruise Boats                     0.534607
## ESTABLISHMENTTYPECheese Plant                             162.065976
## ESTABLISHMENTTYPEChild Care - Catered                       0.255139
## ESTABLISHMENTTYPEChild Care - Food Preparation              0.257712
## ESTABLISHMENTTYPEChurch Banquet Facility                    0.772231
## ESTABLISHMENTTYPECocktail Bar / Beverage Room               0.281142
## ESTABLISHMENTTYPECollege/University Food services           0.436581
## ESTABLISHMENTTYPECommissary                                 0.296216
## ESTABLISHMENTTYPECommunity Kitchen Meal Program             0.277892
## ESTABLISHMENTTYPEElementary School Food services            0.434796
## ESTABLISHMENTTYPEFish Shop                                  0.369276
## ESTABLISHMENTTYPEFlea Market                                1.107033
## ESTABLISHMENTTYPEFood Bank                                  0.480002
## ESTABLISHMENTTYPEFood Cart                                  1.131191
## ESTABLISHMENTTYPEFood Caterer                               0.260440
## ESTABLISHMENTTYPEFood Court Vendor                          0.241514
## ESTABLISHMENTTYPEFood Depot                                 0.317099
```

```
## ESTABLISHMENTTYPEFood Processing Plant                       0.258838
## ESTABLISHMENTTYPEFood Store (Convenience / Variety)          0.243207
## ESTABLISHMENTTYPEFood Take Out                               0.237502
## ESTABLISHMENTTYPEFood Vending Facility                       1.079871
## ESTABLISHMENTTYPEHospitals & Health Facilities               0.363657
## ESTABLISHMENTTYPEHot Dog Cart                                0.465805
## ESTABLISHMENTTYPEIce Cream / Yogurt Vendors                  0.349217
## ESTABLISHMENTTYPEIce Cream Plant                           229.367687
## ESTABLISHMENTTYPEInstitutional Food Service                  0.279529
## ESTABLISHMENTTYPELocker Plant                              229.613378
## ESTABLISHMENTTYPEMeat Processing Plant                       0.545814
## ESTABLISHMENTTYPEMilk Pasteurization Plant                 145.097625
## ESTABLISHMENTTYPEMobile Food Preparation Premises            0.582488
## ESTABLISHMENTTYPENursing Home / Home for the Aged            0.279186
## ESTABLISHMENTTYPEOther Educational Facility Food Services    0.606908
## ESTABLISHMENTTYPERefreshment Stand (Stationary)              0.365435
## ESTABLISHMENTTYPERest Home                                   0.717999
## ESTABLISHMENTTYPERestaurant                                  0.236320
## ESTABLISHMENTTYPERetirement Homes(Licensed)                  0.274714
## ESTABLISHMENTTYPERetirement Homes(Un-licensed)               0.796387
## ESTABLISHMENTTYPESchool Nourishment Program                  0.277765
## ESTABLISHMENTTYPESecondary School Food Services              0.302927
## ESTABLISHMENTTYPEServing Kitchen                             0.311953
## ESTABLISHMENTTYPESupermarket                                 0.242313
## MINIMUM_INSPECTIONS_PERYEAR2                                 0.049918
## MINIMUM_INSPECTIONS_PERYEAR3                                 0.051667
## MONTHAugust                                                  0.050007
## MONTHDecember                                                0.048517
## MONTHFebruary                                                0.050670
## MONTHJanuary                                                 0.053151
## MONTHJuly                                                    0.051878
## MONTHJune                                                    0.047165
## MONTHMarch                                                   0.048282
## MONTHMay                                                     0.050834
## MONTHNovember                                                0.050122
## MONTHOctober                                                 0.049342
## MONTHSeptember                                               0.053586
##                                                           z value Pr(>|z|)
## (Intercept)                                                -8.984  < 2e-16
## ESTABLISHMENTTYPEBakery                                     1.053 0.292377
## ESTABLISHMENTTYPEBanquet Facility                          -2.291 0.021960
## ESTABLISHMENTTYPEBoarding / Lodging Home - Kitchen         -4.050 5.12e-05
## ESTABLISHMENTTYPEBottling Plant                             2.232 0.025600
## ESTABLISHMENTTYPEBowling Alley                              0.371 0.710926
## ESTABLISHMENTTYPEButcher Shop                               0.542 0.587975
## ESTABLISHMENTTYPECafeteria - Public Access                 -1.229 0.219163
## ESTABLISHMENTTYPECatering Vehicle                          -0.073 0.941688
## ESTABLISHMENTTYPEChartered Cruise Boats                     4.181 2.90e-05
## ESTABLISHMENTTYPECheese Plant                              -0.068 0.946115
## ESTABLISHMENTTYPEChild Care - Catered                      -5.028 4.95e-07
## ESTABLISHMENTTYPEChild Care - Food Preparation             -7.252 4.11e-13
```

```
## ESTABLISHMENTTYPEChurch Banquet Facility                    -1.213 0.224997
## ESTABLISHMENTTYPECocktail Bar / Beverage Room                1.889 0.058846
## ESTABLISHMENTTYPECollege/University Food services           -0.914 0.360471
## ESTABLISHMENTTYPECommissary                                 -1.529 0.126327
## ESTABLISHMENTTYPECommunity Kitchen Meal Program             -0.299 0.765042
## ESTABLISHMENTTYPEElementary School Food services            -0.574 0.565766
## ESTABLISHMENTTYPEFish Shop                                  -1.444 0.148654
## ESTABLISHMENTTYPEFlea Market                                -0.186 0.852373
## ESTABLISHMENTTYPEFood Bank                                  -0.315 0.753020
## ESTABLISHMENTTYPEFood Cart                                   0.208 0.834966
## ESTABLISHMENTTYPEFood Caterer                               -2.707 0.006786
## ESTABLISHMENTTYPEFood Court Vendor                           0.616 0.538055
## ESTABLISHMENTTYPEFood Depot                                  0.105 0.916771
## ESTABLISHMENTTYPEFood Processing Plant                       0.592 0.553732
## ESTABLISHMENTTYPEFood Store (Convenience / Variety)          1.050 0.293507
## ESTABLISHMENTTYPEFood Take Out                               0.154 0.877852
## ESTABLISHMENTTYPEFood Vending Facility                      -0.479 0.632053
## ESTABLISHMENTTYPEHospitals & Health Facilities              -3.656 0.000257
## ESTABLISHMENTTYPEHot Dog Cart                               -0.722 0.470517
## ESTABLISHMENTTYPEIce Cream / Yogurt Vendors                 -0.425 0.670890
## ESTABLISHMENTTYPEIce Cream Plant                            -0.045 0.964202
## ESTABLISHMENTTYPEInstitutional Food Service                 -3.121 0.001803
## ESTABLISHMENTTYPELocker Plant                               -0.045 0.964368
## ESTABLISHMENTTYPEMeat Processing Plant                      -0.374 0.708121
## ESTABLISHMENTTYPEMilk Pasteurization Plant                  -0.082 0.934486
## ESTABLISHMENTTYPEMobile Food Preparation Premises           -1.795 0.072713
## ESTABLISHMENTTYPENursing Home / Home for the Aged           -4.098 4.16e-05
## ESTABLISHMENTTYPEOther Educational Facility Food Services   0.387 0.699031
## ESTABLISHMENTTYPERefreshment Stand (Stationary)              0.368 0.712907
## ESTABLISHMENTTYPERest Home                                  -0.215 0.829532
## ESTABLISHMENTTYPERestaurant                                  0.473 0.636017
## ESTABLISHMENTTYPERetirement Homes(Licensed)                 -4.025 5.69e-05
## ESTABLISHMENTTYPERetirement Homes(Un-licensed)              -1.618 0.105571
## ESTABLISHMENTTYPESchool Nourishment Program                 -0.670 0.502802
## ESTABLISHMENTTYPESecondary School Food Services             -1.352 0.176430
## ESTABLISHMENTTYPEServing Kitchen                            -2.334 0.019606
## ESTABLISHMENTTYPESupermarket                                 1.352 0.176220
## MINIMUM_INSPECTIONS_PERYEAR2                               13.602  < 2e-16
## MINIMUM_INSPECTIONS_PERYEAR3                               32.580  < 2e-16
## MONTHAugust                                                -4.969 6.72e-07
## MONTHDecember                                              -3.998 6.40e-05
## MONTHFebruary                                               0.054 0.956617
## MONTHJanuary                                               -2.650 0.008038
## MONTHJuly                                                  -3.033 0.002420
## MONTHJune                                                   2.155 0.031124
## MONTHMarch                                                 -2.312 0.020797
## MONTHMay                                                    1.628 0.103558
## MONTHNovember                                              -6.139 8.28e-10
## MONTHOctober                                               -4.056 5.00e-05
## MONTHSeptember                                             -4.834 1.34e-06
##
```

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## (Intercept)                                          ***
## ESTABLISHMENTTYPEBakery
## ESTABLISHMENTTYPEBanquet Facility                     *
## ESTABLISHMENTTYPEBoarding / Lodging Home - Kitchen    ***
## ESTABLISHMENTTYPEBottling Plant                       *
## ESTABLISHMENTTYPEBowling Alley
## ESTABLISHMENTTYPEButcher Shop
## ESTABLISHMENTTYPECafeteria - Public Access
## ESTABLISHMENTTYPECatering Vehicle
## ESTABLISHMENTTYPEChartered Cruise Boats               ***
## ESTABLISHMENTTYPECheese Plant
## ESTABLISHMENTTYPEChild Care - Catered                 ***
## ESTABLISHMENTTYPEChild Care - Food Preparation        ***
## ESTABLISHMENTTYPEChurch Banquet Facility
## ESTABLISHMENTTYPECocktail Bar / Beverage Room         .
## ESTABLISHMENTTYPECollege/University Food services
## ESTABLISHMENTTYPECommissary
## ESTABLISHMENTTYPECommunity Kitchen Meal Program
## ESTABLISHMENTTYPEElementary School Food services
## ESTABLISHMENTTYPEFish Shop
## ESTABLISHMENTTYPEFlea Market
## ESTABLISHMENTTYPEFood Bank
## ESTABLISHMENTTYPEFood Cart
## ESTABLISHMENTTYPEFood Caterer                         **
## ESTABLISHMENTTYPEFood Court Vendor
## ESTABLISHMENTTYPEFood Depot
## ESTABLISHMENTTYPEFood Processing Plant
## ESTABLISHMENTTYPEFood Store (Convenience / Variety)
## ESTABLISHMENTTYPEFood Take Out
## ESTABLISHMENTTYPEFood Vending Facility
## ESTABLISHMENTTYPEHospitals & Health Facilities        ***
## ESTABLISHMENTTYPEHot Dog Cart
## ESTABLISHMENTTYPEIce Cream / Yogurt Vendors
## ESTABLISHMENTTYPEIce Cream Plant
## ESTABLISHMENTTYPEInstitutional Food Service           **
## ESTABLISHMENTTYPELocker Plant
## ESTABLISHMENTTYPEMeat Processing Plant
## ESTABLISHMENTTYPEMilk Pasteurization Plant
## ESTABLISHMENTTYPEMobile Food Preparation Premises     .
## ESTABLISHMENTTYPENursing Home / Home for the Aged     ***
## ESTABLISHMENTTYPEOther Educational Facility Food Services
## ESTABLISHMENTTYPERefreshment Stand (Stationary)
## ESTABLISHMENTTYPERest Home
## ESTABLISHMENTTYPERestaurant
## ESTABLISHMENTTYPERetirement Homes(Licensed)           ***
## ESTABLISHMENTTYPERetirement Homes(Un-licensed)
## ESTABLISHMENTTYPESchool Nourishment Program
## ESTABLISHMENTTYPESecondary School Food Services
## ESTABLISHMENTTYPEServing Kitchen                      *
## ESTABLISHMENTTYPESupermarket
## MINIMUM_INSPECTIONS_PERYEAR2                          ***
```

```
## MINIMUM_INSPECTIONS_PERYEAR3                                    ***
## MONTHAugust                                                     ***
## MONTHDecember                                                   ***
## MONTHFebruary
## MONTHJanuary                                                    **
## MONTHJuly                                                       **
## MONTHJune                                                       *
## MONTHMarch                                                      *
## MONTHMay
## MONTHNovember                                                   ***
## MONTHOctober                                                    ***
## MONTHSeptember                                                  ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 58267  on 55418  degrees of freedom
## Residual deviance: 54433  on 55356  degrees of freedom
## AIC: 54559
##
## Number of Fisher Scoring iterations: 11
```