Resiliency Food Model

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```
# Importing the revised dataset with the 2018 IL data for child_elig
Final_Variables_June_2024 <-
read.csv("~/Desktop/R Directory/resiliency_collab/data/Final_Variables_June_2024.csv")

glimpse(Final_Variables_June_2024)
```
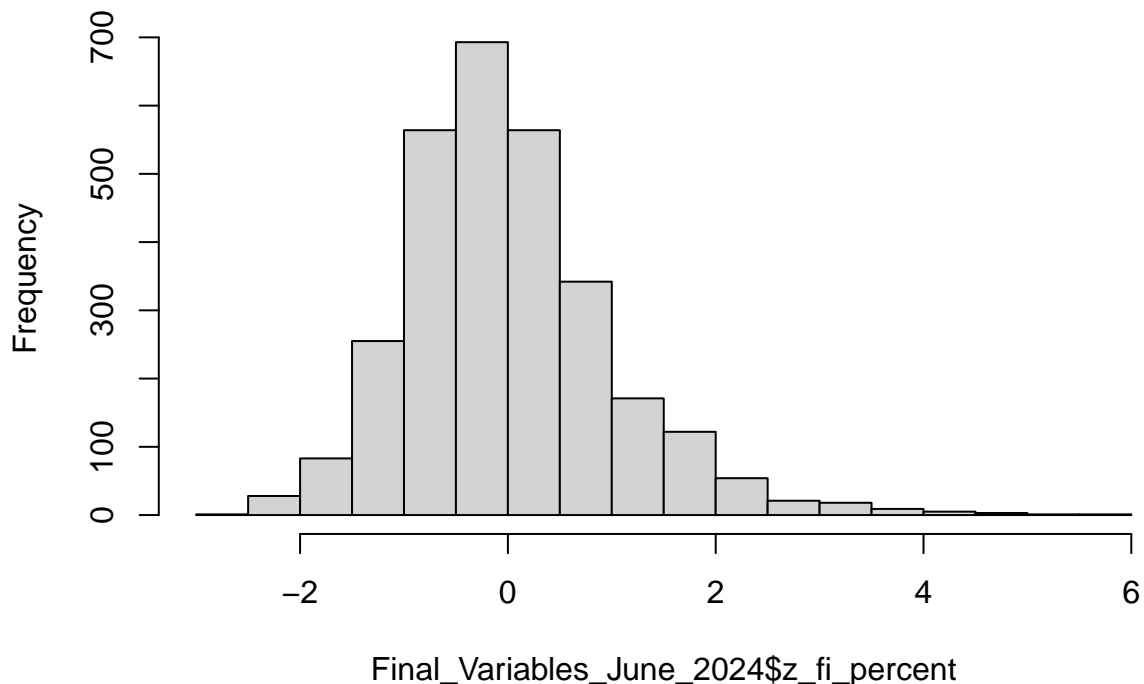
Food Model

DV 1: FI Percent

```
# Histogram using the z-scored FI Percent
hist(Final_Variables_June_2024$z_fi_percent)
```


Histogram of Final_Variables_June_2024$z_fi_percent

```
#just checking the RAW variables (unique only) for FI Percent
unique(round(Final_Variables_June_2024$fi_percent)) #note:rounded to whole for quicker checks
```

```
## [1] 13 12 22 14 11 25 21 16 18 20 23 15 27 30 17 26 24 29 19  9 28 10  8  6  7
## [26]  5 NA 33 34 31 32 36  4  3
```

```
summary(Final_Variables_June_2024$fi_percent)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##    2.90   10.70   12.90   13.38   15.45   36.30     206
```

```
# 206 missing values #Where are the NAs?
missing_fi_percent <-
Final_Variables_June_2024 %>%
filter(is.na(fi_percent)) # Missing values are Illinois and Kansas
table(missing_fi_percent$State.x) # IL (101) and KS (105)
```

```
##
##  il  ks
## 101 105
```
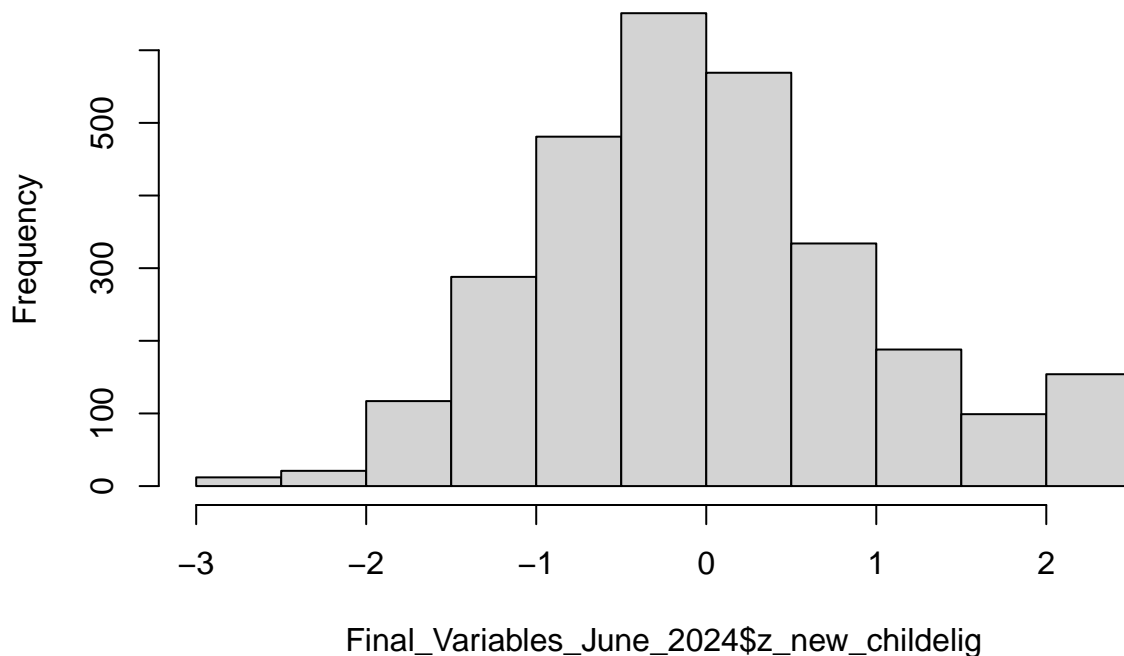
DV 2: Child Elig Lunch Perc

Note: Using New Variable (new_childelig), which incorporated the 2018 IL data

```
# Histogram using the z-scored z_new_childelig
hist(Final_Variables_June_2024$z_new_childelig)
```

Histogram of Final_Variables_June_2024$z_new_childelig


```
#just checking the RAW variables (unique only) for new_childelig
unique(round(Final_Variables_June_2024$new_childelig)) # note: rounded to whole for quicker checks
```

```
##    [1]  43  48  63  62  53  76  79  59  71  61  77  72  60  52  65  57  64  51
##   [19]  81  69  49  68  58  85  78  47  42  96  97  39  67  91  73  29  94   4
##   [37]  20  90  86   1  22  30  37 100  82  93  50   2   3   8  56  54  75  34
##   [55]  31  46  40  23  38  44  12  27  24  33  45  36  25  41  32  70  35  74
##   [73]  28  55  26  18  88  21  13  NA  66  84  98  83  99  87  92  95  80  89
##   [91]  16  19  15   0   6  14  10   5  17   9
```

```r
summary(Final_Variables_June_2024$new_childelig) # 227 missing values
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##    0.00   41.06   52.61   54.04   64.42  100.00     227
```

```r
# Where are the NAs? Primarily Kansas and Tennessee
missing_child <- Final_Variables_June_2024 %>%
  filter(is.na(new_childelig))

table(missing_child$State.x)
```

```
##
## dc  de  fl  ga  hi  ks  ma  ms  oh  sd  tn  tx
##  1   3   1   1   1 105  14   1   3   1  95   1
```

```r
# Did we resolve the strange IL values? Yes.
strange_values_child <-
Final_Variables_June_2024 %>%
filter(new_childelig < abs(5))
table(strange_values_child$State.x)
```

```
##
## ak ar mt nd ne tx
##  4  1  1  1  2  1
```

Building the Models

DV 1: FI Percent

IV: Demographics (9 variables), DV: FI Percent

```r
z_fi_just_demos <- lm(formula = z_fi_percent ~ z_ACS_PCT_BLACK +
    z_ACS_PCT_HISPAN + z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB +
    z_SVI_RPL_THEME3_MINO + z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL +
    z_ACS_PCT_NON_CITIZEN + z_ACS_MEDIAN_AGE, data = Final_Variables_June_2024)
summary(z_fi_just_demos)
```

```
##
## Call:
## lm(formula = z_fi_percent ~ z_ACS_PCT_BLACK + z_ACS_PCT_HISPAN +
##     z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB + z_SVI_RPL_THEME3_MINO +
##     z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL + z_ACS_PCT_NON_CITIZEN +
##     z_ACS_MEDIAN_AGE, data = Final_Variables_June_2024)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.56687 -0.35495 -0.02754  0.30838  2.79634
##
## Coefficients:
##                           Estimate Std. Error t value            Pr(>|t|)
## (Intercept)              -0.027240   0.009826  -2.772             0.00560 **
## z_ACS_PCT_BLACK           0.340795   0.012914  26.390 < 0.0000000000000002 ***
## z_ACS_PCT_HISPAN         -0.108461   0.017249  -6.288      0.0000000003692 ***
## z_SVI_RPL_THEME1_SOCIECO  0.460410   0.015818  29.107 < 0.0000000000000002 ***
```

```
## z_SVI_RPL_THEME2_HH_DISB    0.092328    0.013621    6.778        0.0000000000146 ***
## z_SVI_RPL_THEME3_MINO        0.047716    0.017728    2.692                0.00715 **
## z_SVI_RPL_THEME4_HH_TRANS    0.127838    0.013069    9.782 < 0.0000000000000002 ***
## z_ACS_PCT_ENGL_NOT_WELL     -0.174539    0.027701   -6.301        0.0000000003407 ***
## z_ACS_PCT_NON_CITIZEN        0.017785    0.024917    0.714                0.47543
## z_ACS_MEDIAN_AGE            -0.034604    0.011587   -2.986                0.00285 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.5315 on 2924 degrees of freedom
##   (207 observations deleted due to missingness)
## Multiple R-squared:  0.7184, Adjusted R-squared:  0.7176
## F-statistic:   829 on 9 and 2924 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Demographic IVs

```
confint(z_fi_just_demos)
```

```
##                                2.5 %        97.5 %
## (Intercept)              -0.04650621 -0.007974379
## z_ACS_PCT_BLACK           0.31547422  0.366116057
## z_ACS_PCT_HISPAN         -0.14228194 -0.074640899
## z_SVI_RPL_THEME1_SOCIECO  0.42939480  0.491424850
## z_SVI_RPL_THEME2_HH_DISB  0.06562040  0.119034726
## z_SVI_RPL_THEME3_MINO     0.01295593  0.082476926
## z_SVI_RPL_THEME4_HH_TRANS 0.10221291  0.153462388
## z_ACS_PCT_ENGL_NOT_WELL  -0.22885405 -0.120223146
## z_ACS_PCT_NON_CITIZEN    -0.03107170  0.066641455
## z_ACS_MEDIAN_AGE         -0.05732410 -0.011884732
```

VIF for Demographic IVs

```
vif(z_fi_just_demos)
```

```
##          z_ACS_PCT_BLACK          z_ACS_PCT_HISPAN z_SVI_RPL_THEME1_SOCIECO
##                 1.817945                  3.176416                 2.649043
##  z_SVI_RPL_THEME2_HH_DISB    z_SVI_RPL_THEME3_MINO z_SVI_RPL_THEME4_HH_TRANS
##                 1.937136                  3.251132                 1.748337
##   z_ACS_PCT_ENGL_NOT_WELL    z_ACS_PCT_NON_CITIZEN          z_ACS_MEDIAN_AGE
##                 8.011710                  6.488574                 1.413795
```

IV: Food & Housing (12 variables), DV: FI Percent

Note: FI Percent and Child Lunch Elig Removed from IVs

```
z_fi_just_foodhouse <- lm(formula = z_fi_percent ~
    z_food_afford + z_fd_enviro_indx + z_ACS_PCT_FOOD_STAMP +
        z_shp_percent + z_shcb_percent + z_ACS_PCT_NO_VEH +
        z_ACS_PCT_RENTER_HH_CHILD + z_ACS_PCT_RENT_COST_30PCT +
        z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH +
        z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE,
    data = Final_Variables_June_2024)
summary(z_fi_just_foodhouse)
```

```
## 
## Call:
## lm(formula = z_fi_percent ~ z_food_afford + z_fd_enviro_indx +
##     z_ACS_PCT_FOOD_STAMP + z_shp_percent + z_shcb_percent + z_ACS_PCT_NO_VEH +
##     z_ACS_PCT_RENTER_HH_CHILD + z_ACS_PCT_RENT_COST_30PCT + z_ACS_PCT_MOBILE_HOME +
##     z_ACS_PCT_OWNED_HH + z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE,
##     data = Final_Variables_June_2024)
## 
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.3605 -0.2375  0.0236  0.2798  2.2842
## 
## Coefficients:
##                            Estimate Std. Error t value             Pr(>|t|)
## (Intercept)               -0.019140   0.009073  -2.110                0.035 *
## z_food_afford              0.015622   0.014402   1.085                0.278
## z_fd_enviro_indx          -0.508299   0.012647 -40.191 < 0.0000000000000002 ***
## z_ACS_PCT_FOOD_STAMP       0.166591   0.016568  10.055 < 0.0000000000000002 ***
## z_shp_percent             -0.095247   0.016580  -5.745 0.000000010169789013 ***
## z_shcb_percent             0.147111   0.018138   8.111 0.000000000000000736 ***
## z_ACS_PCT_NO_VEH           0.084547   0.012404   6.816 0.000000000011328256 ***
## z_ACS_PCT_RENTER_HH_CHILD  0.011908   0.010813   1.101                0.271
## z_ACS_PCT_RENT_COST_30PCT  0.125866   0.012974   9.702 < 0.0000000000000002 ***
## z_ACS_PCT_MOBILE_HOME      0.140691   0.012140  11.589 < 0.0000000000000002 ***
## z_ACS_PCT_OWNED_HH        -0.106914   0.012702  -8.417 < 0.0000000000000002 ***
## z_ACS_PCT_OWNER_HH_CHILD  -0.006560   0.010685  -0.614                0.539
## z_ACS_MEDIAN_HOME_VALUE   -0.109632   0.013282  -8.254 0.000000000000000230 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 0.4868 on 2898 degrees of freedom
##   (230 observations deleted due to missingness)
## Multiple R-squared:  0.7642, Adjusted R-squared:  0.7633
## F-statistic: 782.9 on 12 and 2898 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Food & Housing IVs

```r
confint(z_fi_just_foodhouse)
```

```
##                                  2.5 %       97.5 %
## (Intercept)               -0.036929167 -0.001350756
## z_food_afford             -0.012616366  0.043860208
## z_fd_enviro_indx          -0.533097052 -0.483500719
## z_ACS_PCT_FOOD_STAMP       0.134104902  0.199076710
## z_shp_percent             -0.127757815 -0.062737118
## z_shcb_percent             0.111545524  0.182675558
## z_ACS_PCT_NO_VEH           0.060225478  0.108867695
## z_ACS_PCT_RENTER_HH_CHILD -0.009293298  0.033109867
## z_ACS_PCT_RENT_COST_30PCT  0.100427484  0.151304019
## z_ACS_PCT_MOBILE_HOME      0.116886475  0.164496108
## z_ACS_PCT_OWNED_HH        -0.131819211 -0.082008073
## z_ACS_PCT_OWNER_HH_CHILD  -0.027511168  0.014391164
## z_ACS_MEDIAN_HOME_VALUE   -0.135675266 -0.083588938
```

VIF for Food & Housing IVs

```r
vif(z_fi_just_foodhouse)
```

```
##            z_food_afford          z_fd_enviro_indx       z_ACS_PCT_FOOD_STAMP
##                 2.616802                  1.999418                   3.425598
##            z_shp_percent             z_shcb_percent           z_ACS_PCT_NO_VEH
##                 3.416456                  4.050694                   1.978739
## z_ACS_PCT_RENTER_HH_CHILD z_ACS_PCT_RENT_COST_30PCT     z_ACS_PCT_MOBILE_HOME
##                 1.444559                  2.022566                   1.832092
##        z_ACS_PCT_OWNED_HH   z_ACS_PCT_OWNER_HH_CHILD    z_ACS_MEDIAN_HOME_VALUE
##                 1.955818                  1.422190                   2.218232
```

IV: Education (3 variables), DV: FI Percent

```r
z_fi_just_ed <- lm(formula = z_fi_percent ~ z_hsg_rate + z_sc_percent +
    z_ms_average, data = Final_Variables_June_2024)
summary(z_fi_just_ed)
```

```
##
## Call:
## lm(formula = z_fi_percent ~ z_hsg_rate + z_sc_percent + z_ms_average,
##     data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.5805 -0.5469 -0.0775  0.4903  4.0535
##
## Coefficients:
##              Estimate Std. Error t value          Pr(>|t|)
## (Intercept)  -0.03338    0.01857  -1.798            0.0723 .
## z_hsg_rate   -0.14577    0.01983  -7.351   0.000000000000275 ***
## z_sc_percent -0.28035    0.01990 -14.091 < 0.0000000000000002 ***
## z_ms_average -0.57666    0.03467 -16.632 < 0.0000000000000002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8352 on 2222 degrees of freedom
##   (915 observations deleted due to missingness)
## Multiple R-squared:  0.3108, Adjusted R-squared:  0.3098
## F-statistic: 333.9 on 3 and 2222 DF,  p-value: < 0.0000000000000022
```

Confidence Intervals for Education IVs

```r
confint(z_fi_just_ed)
```

```
##                   2.5 %       97.5 %
## (Intercept)  -0.06979178  0.003025358
## z_hsg_rate   -0.18466217 -0.106884138
## z_sc_percent -0.31937171 -0.241337007
## z_ms_average -0.64465838 -0.508669019
```

VIF for Education IVs

```r
vif(z_fi_just_ed)
```

```
##   z_hsg_rate z_sc_percent z_ms_average
##     1.088737     1.205730     1.301874
```

IV: Technology (3 variables), DV: FI Percent

```r
z_fi_just_tech <- lm(formula = z_fi_percent ~ z_ACS_PCT_NO_PC +
    z_ACS_PCT_SMARTPHONE + z_ACS_PCT_BROADBAND, data = Final_Variables_June_2024)
summary(z_fi_just_tech)
```

```
##
## Call:
## lm(formula = z_fi_percent ~ z_ACS_PCT_NO_PC + z_ACS_PCT_SMARTPHONE +
##     z_ACS_PCT_BROADBAND, data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.3111 -0.4918 -0.0546  0.4493  4.3139
##
## Coefficients:
##                       Estimate Std. Error t value        Pr(>|t|)
## (Intercept)          -0.005356   0.014734  -0.364        0.716224
## z_ACS_PCT_NO_PC       0.262205   0.038015   6.897   0.00000000000646 ***
## z_ACS_PCT_SMARTPHONE  0.287926   0.018270  15.760 < 0.0000000000000002 ***
## z_ACS_PCT_BROADBAND  -0.142782   0.041482  -3.442        0.000586 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.798 on 2931 degrees of freedom
##   (206 observations deleted due to missingness)
## Multiple R-squared:  0.3639, Adjusted R-squared:  0.3632
## F-statistic: 558.9 on 3 and 2931 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Technology IVs

```r
confint(z_fi_just_tech)
```

```
##                          2.5 %      97.5 %
## (Intercept)         -0.0342464   0.0235335
## z_ACS_PCT_NO_PC      0.1876666   0.3367439
## z_ACS_PCT_SMARTPHONE 0.2521031   0.3237494
## z_ACS_PCT_BROADBAND -0.2241192  -0.0614446
```

VIF for Technology IVs

```r
vif(z_fi_just_tech)
```

```
##      z_ACS_PCT_NO_PC z_ACS_PCT_SMARTPHONE  z_ACS_PCT_BROADBAND
##             6.856215             1.583618             8.193639
```

IV: HWCC (7 variables), DV: FI Percent

```
z_fi_just_HWCC <- lm(formula = z_fi_percent ~ z_pphd_avgnum +
    z_pmhd_avgnum + z_lbw_percent_lbw + z_pi_phy_inact + z_cip_perc +
    z_csph_perc + z_ACS_PCT_CHILD_DISAB, data = Final_Variables_June_2024)
summary(z_fi_just_HWCC)
```

```
##
## Call:
## lm(formula = z_fi_percent ~ z_pphd_avgnum + z_pmhd_avgnum + z_lbw_percent_lbw +
##     z_pi_phy_inact + z_cip_perc + z_csph_perc + z_ACS_PCT_CHILD_DISAB,
##     data = Final_Variables_June_2024)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -3.09724 -0.33857 -0.02834  0.31575  2.21498
##
## Coefficients:
##                         Estimate Std. Error t value             Pr(>|t|)
## (Intercept)           -0.0248768  0.0104719  -2.376              0.01759 *
## z_pphd_avgnum          0.2282429  0.0336323   6.786      0.0000000000139 ***
## z_pmhd_avgnum          0.0000652  0.0302864   0.002              0.99828
## z_lbw_percent_lbw      0.1416873  0.0137082  10.336 < 0.0000000000000002 ***
## z_pi_phy_inact         0.0239352  0.0124579   1.921              0.05480 .
## z_cip_perc             0.3387044  0.0200032  16.933 < 0.0000000000000002 ***
## z_csph_perc            0.2451348  0.0155261  15.789 < 0.0000000000000002 ***
## z_ACS_PCT_CHILD_DISAB -0.0320371  0.0115995  -2.762              0.00578 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.5554 on 2828 degrees of freedom
##   (305 observations deleted due to missingness)
## Multiple R-squared:  0.6928, Adjusted R-squared:  0.6921
## F-statistic: 911.3 on 7 and 2828 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for HWCC IVs

```
confint(z_fi_just_HWCC)
```

```
##                              2.5 %        97.5 %
## (Intercept)           -0.0454101585 -0.004343485
## z_pphd_avgnum          0.1622965451  0.294189244
## z_pmhd_avgnum         -0.0593203805  0.059450789
## z_lbw_percent_lbw      0.1148083023  0.168566403
## z_pi_phy_inact        -0.0004923083  0.048362675
## z_cip_perc             0.2994820816  0.377926664
## z_csph_perc            0.2146912246  0.275578429
## z_ACS_PCT_CHILD_DISAB -0.0547813547 -0.009292766
```

VIF for HWCC IVs

```
vif(z_fi_just_HWCC)
```

```
##         z_pphd_avgnum         z_pmhd_avgnum     z_lbw_percent_lbw
```

```
##          10.682130              8.484670              1.780216
##        z_pi_phy_inact            z_cip_perc            z_csph_perc
##           1.498235              3.823639              2.145785
## z_ACS_PCT_CHILD_DISAB
##           1.171088
```

IV: Health A (6 variables), DV: FI Percent

```
z_fi_just_healthA <- lm(formula = z_fi_percent ~ z_phys_per_cap +
    z_mhp_per_cap + z_dents_per_cap + z_uninsur_perc + z_opcp_rate +
    z_TeenBirths, data = Final_Variables_June_2024)
summary(z_fi_just_healthA)
```

```
##
## Call:
## lm(formula = z_fi_percent ~ z_phys_per_cap + z_mhp_per_cap +
##     z_dents_per_cap + z_uninsur_perc + z_opcp_rate + z_TeenBirths,
##     data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2.6509 -0.5607 -0.0861  0.4532  5.4197
##
## Coefficients:
##                 Estimate Std. Error t value          Pr(>|t|)
## (Intercept)    -0.001998   0.017440  -0.115          0.908780
## z_phys_per_cap -0.093454   0.024637  -3.793          0.000152 ***
## z_mhp_per_cap   0.030320   0.022557   1.344          0.179004
## z_dents_per_cap -0.123260   0.023825  -5.174   0.0000002452234596 ***
## z_uninsur_perc  0.258393   0.018223  14.180 < 0.0000000000000002 ***
## z_opcp_rate     0.148943   0.019808   7.519   0.0000000000000729 ***
## z_TeenBirths    0.005129   0.018067   0.284          0.776496
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9406 on 2907 degrees of freedom
##   (227 observations deleted due to missingness)
## Multiple R-squared:  0.116,  Adjusted R-squared:  0.1142
## F-statistic: 63.59 on 6 and 2907 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Health A IVs

```
confint(z_fi_just_healthA)
```

```
##                      2.5 %       97.5 %
## (Intercept)    -0.03619483  0.03219798
## z_phys_per_cap -0.14176279 -0.04514594
## z_mhp_per_cap  -0.01390945  0.07455013
## z_dents_per_cap -0.16997561 -0.07654506
## z_uninsur_perc  0.22266206  0.29412323
## z_opcp_rate     0.11010345  0.18778212
## z_TeenBirths   -0.03029554  0.04055435
```

VIF for Health A IVs

```
vif(z_fi_just_healthA)
```

```
##  z_phys_per_cap    z_mhp_per_cap z_dents_per_cap  z_uninsur_perc      z_opcp_rate
##        2.002836         1.675825        1.904169        1.103320         1.335900
##    z_TeenBirths
##        1.144151
```

IV: Health B (5 variables), DV: FI Percent

```
z_fi_just_healthB <- lm(formula = z_fi_percent ~ z_phs_rate +
    z_ms_perc_ann + z_AMFAR_AMATFAC + z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC,
    data = Final_Variables_June_2024)
summary(z_fi_just_healthB)
```

```
##
## Call:
## lm(formula = z_fi_percent ~ z_phs_rate + z_ms_perc_ann + z_AMFAR_AMATFAC +
##     z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC, data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2.8241 -0.5426 -0.0738  0.4388  4.8537
##
## Coefficients:
##                         Estimate Std. Error t value         Pr(>|t|)
## (Intercept)             0.004060   0.016741    0.243         0.808398
## z_phs_rate              0.278808   0.017347   16.072 < 0.0000000000000002 ***
## z_ms_perc_ann          -0.284707   0.017640  -16.139 < 0.0000000000000002 ***
## z_AMFAR_AMATFAC         0.006695   0.016204    0.413         0.679529
## z_MP_PERCPEN           -0.028188   0.017515   -1.609         0.107650
## z_AHRF_RURAL_H_CLINIC   0.057081   0.016733    3.411         0.000656 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8892 on 2827 degrees of freedom
##   (308 observations deleted due to missingness)
## Multiple R-squared:  0.2033, Adjusted R-squared:  0.2019
## F-statistic: 144.3 on 5 and 2827 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Health B IVs

```
confint(z_fi_just_healthB)
```

```
##                             2.5 %       97.5 %
## (Intercept)           -0.02876573  0.036885625
## z_phs_rate             0.24479414  0.312821985
## z_ms_perc_ann         -0.31929680 -0.250118033
## z_AMFAR_AMATFAC       -0.02507812  0.038467401
## z_MP_PERCPEN          -0.06253146  0.006155563
## z_AHRF_RURAL_H_CLINIC  0.02427110  0.089890526
```

VIF for Health B IVs

```
vif(z_fi_just_healthB)
```

```
##           z_phs_rate          z_ms_perc_ann      z_AMFAR_AMATFAC
##             1.090861               1.090994             1.029316
##         z_MP_PERCPEN z_AHRF_RURAL_H_CLINIC
##             1.080584               1.025402
```

IV: Business (4 variables), DV: FI Percent

```
z_fi_just_bus <- lm(formula = z_fi_percent ~ z_ACS_MEDIAN_HH_INCOME +
    z_ACS_PCT_WORK_NO_CAR + z_ACS_GINI_INDEX + z_unemp_perc,
    data = Final_Variables_June_2024)
summary(z_fi_just_bus)
```

```
##
## Call:
## lm(formula = z_fi_percent ~ z_ACS_MEDIAN_HH_INCOME + z_ACS_PCT_WORK_NO_CAR +
##     z_ACS_GINI_INDEX + z_unemp_perc, data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2.8692 -0.3925 -0.0513  0.3433  3.3425
##
## Coefficients:
##                        Estimate Std. Error t value          Pr(>|t|)
## (Intercept)            -0.01317    0.01203  -1.095             0.274
## z_ACS_MEDIAN_HH_INCOME -0.43860    0.01377 -31.855 < 0.0000000000000002 ***
## z_ACS_PCT_WORK_NO_CAR   0.05095    0.01243   4.097         0.0000429 ***
## z_ACS_GINI_INDEX        0.23303    0.01316  17.713 < 0.0000000000000002 ***
## z_unemp_perc            0.29157    0.01372  21.250 < 0.0000000000000002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6511 on 2928 degrees of freedom
##   (208 observations deleted due to missingness)
## Multiple R-squared:  0.5768, Adjusted R-squared:  0.5762
## F-statistic: 997.7 on 4 and 2928 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Business IVs

```
confint(z_fi_just_bus)
```

```
##                             2.5 %       97.5 %
## (Intercept)            -0.03675160  0.01041732
## z_ACS_MEDIAN_HH_INCOME -0.46560154 -0.41160660
## z_ACS_PCT_WORK_NO_CAR   0.02656688  0.07532893
## z_ACS_GINI_INDEX        0.20723688  0.25882995
## z_unemp_perc            0.26466286  0.31846965
```

VIF for Business IVs

```
vif(z_fi_just_bus)
```

```
## z_ACS_MEDIAN_HH_INCOME  z_ACS_PCT_WORK_NO_CAR       z_ACS_GINI_INDEX
##               1.357804                 1.131178               1.208745
##           z_unemp_perc
##               1.325923
```

IV: Government (5 variables), DV: FI Percent

```
z_fi_just_gov <- lm(formula = z_fi_percent ~ z_soc_assoc_num +
    z_aeo_perc_w_acc + z_dwv_presence + z_ACS_PCT_HH_PUB_ASSIST +
    z_AHRF_TXC_SITE_NO_CNTRL, data = Final_Variables_June_2024)
summary(z_fi_just_gov)
```

```
##
## Call:
## lm(formula = z_fi_percent ~ z_soc_assoc_num + z_aeo_perc_w_acc +
##     z_dwv_presence + z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL,
##     data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2.7104 -0.6138 -0.0980  0.4728  5.7582
##
## Coefficients:
##                           Estimate Std. Error t value          Pr(>|t|)
## (Intercept)              -0.011083   0.017447  -0.635            0.5253
## z_soc_assoc_num           0.035310   0.018498   1.909            0.0564 .
## z_aeo_perc_w_acc         -0.292707   0.018610 -15.728 <0.0000000000000002 ***
## z_dwv_presence            0.041941   0.017699   2.370            0.0179 *
## z_ACS_PCT_HH_PUB_ASSIST   0.193814   0.017852  10.857 <0.0000000000000002 ***
## z_AHRF_TXC_SITE_NO_CNTRL -0.009399   0.018169  -0.517            0.6050
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9367 on 2879 degrees of freedom
##   (256 observations deleted due to missingness)
## Multiple R-squared:  0.114,  Adjusted R-squared:  0.1124
## F-statistic: 74.07 on 5 and 2879 DF,  p-value: < 0.0000000000000022
```

Confidence Intervals for Government IVs

```
confint(z_fi_just_gov)
```

```
##                                  2.5 %      97.5 %
## (Intercept)              -0.0452924267  0.02312699
## z_soc_assoc_num          -0.0009603903  0.07158104
## z_aeo_perc_w_acc         -0.3291980711 -0.25621570
## z_dwv_presence            0.0072371793  0.07664565
## z_ACS_PCT_HH_PUB_ASSIST   0.1588099762  0.22881886
## z_AHRF_TXC_SITE_NO_CNTRL -0.0450235417  0.02622597
```

VIF for Government IVs

```r
vif(z_fi_just_gov)
```

```
##         z_soc_assoc_num        z_aeo_perc_w_acc          z_dwv_presence
##                1.199508               1.151550                1.031309
##   z_ACS_PCT_HH_PUB_ASSIST z_AHRF_TXC_SITE_NO_CNTRL
##                1.011955               1.066580
```

Final Food Model, DV: FI Percent; IVs: 54

```r
z_fi_levels_12345678 <- lm(formula = z_fi_percent ~ z_ACS_PCT_BLACK +
    z_ACS_PCT_HISPAN + z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB +
    z_SVI_RPL_THEME3_MINO + z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL +
    z_ACS_PCT_NON_CITIZEN + z_ACS_MEDIAN_AGE + z_food_afford +
    z_fd_enviro_indx + z_ACS_PCT_FOOD_STAMP + z_shp_percent +
    z_shcb_percent + z_ACS_PCT_NO_VEH + z_ACS_PCT_RENTER_HH_CHILD +
    z_ACS_PCT_RENT_COST_30PCT + z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH +
    z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE + z_hsg_rate +
    z_sc_percent + z_ms_average + z_ACS_PCT_NO_PC + z_ACS_PCT_SMARTPHONE +
    z_ACS_PCT_BROADBAND + z_pphd_avgnum + z_pmhd_avgnum + z_lbw_percent_lbw +
    z_pi_phy_inact + z_cip_perc + z_csph_perc + z_ACS_PCT_CHILD_DISAB +
    z_phys_per_cap + z_mhp_per_cap + z_dents_per_cap + z_uninsur_perc +
    z_opcp_rate + z_TeenBirths + z_phs_rate + z_ms_perc_ann +
    z_AMFAR_AMATFAC + z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC +
    z_ACS_MEDIAN_HH_INCOME + z_ACS_PCT_WORK_NO_CAR + z_ACS_GINI_INDEX +
    z_unemp_perc + z_soc_assoc_num + z_aeo_perc_w_acc + z_dwv_presence +
    z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL, data = Final_Variables_June_2024)
summary(z_fi_levels_12345678)
```

```
##
## Call:
## lm(formula = z_fi_percent ~ z_ACS_PCT_BLACK + z_ACS_PCT_HISPAN +
##     z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB + z_SVI_RPL_THEME3_MINO +
##     z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL + z_ACS_PCT_NON_CITIZEN +
##     z_ACS_MEDIAN_AGE + z_food_afford + z_fd_enviro_indx + z_ACS_PCT_FOOD_STAMP +
##     z_shp_percent + z_shcb_percent + z_ACS_PCT_NO_VEH + z_ACS_PCT_RENTER_HH_CHILD +
##     z_ACS_PCT_RENT_COST_30PCT + z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH +
##     z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE + z_hsg_rate +
##     z_sc_percent + z_ms_average + z_ACS_PCT_NO_PC + z_ACS_PCT_SMARTPHONE +
##     z_ACS_PCT_BROADBAND + z_pphd_avgnum + z_pmhd_avgnum + z_lbw_percent_lbw +
##     z_pi_phy_inact + z_cip_perc + z_csph_perc + z_ACS_PCT_CHILD_DISAB +
##     z_phys_per_cap + z_mhp_per_cap + z_dents_per_cap + z_uninsur_perc +
##     z_opcp_rate + z_TeenBirths + z_phs_rate + z_ms_perc_ann +
##     z_AMFAR_AMATFAC + z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC +
##     z_ACS_MEDIAN_HH_INCOME + z_ACS_PCT_WORK_NO_CAR + z_ACS_GINI_INDEX +
##     z_unemp_perc + z_soc_assoc_num + z_aeo_perc_w_acc + z_dwv_presence +
##     z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL, data = Final_Variables_June_2024)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.42907 -0.18878 -0.00378  0.18647  1.20873
##
```

```
## Coefficients:
##                            Estimate Std. Error t value           Pr(>|t|)
## (Intercept)               0.0141285  0.0077167   1.831           0.067261
## z_ACS_PCT_BLACK           0.2300999  0.0153840  14.957 < 0.0000000000000002
## z_ACS_PCT_HISPAN         -0.2398632  0.0156397 -15.337 < 0.0000000000000002
## z_SVI_RPL_THEME1_SOCIECO -0.0338697  0.0222894  -1.520           0.128780
## z_SVI_RPL_THEME2_HH_DISB  0.0229321  0.0125044   1.834           0.066810
## z_SVI_RPL_THEME3_MINO     0.0176884  0.0151715   1.166           0.243790
## z_SVI_RPL_THEME4_HH_TRANS 0.0237335  0.0119367   1.988           0.046912
## z_ACS_PCT_ENGL_NOT_WELL  -0.0751603  0.0236121  -3.183           0.001479
## z_ACS_PCT_NON_CITIZEN     0.0210162  0.0217126   0.968           0.333193
## z_ACS_MEDIAN_AGE         -0.0480575  0.0173648  -2.768           0.005699
## z_food_afford            -0.0489678  0.0138934  -3.525           0.000433
## z_fd_enviro_indx         -0.3478677  0.0137094 -25.374 < 0.0000000000000002
## z_ACS_PCT_FOOD_STAMP      0.0421208  0.0188803   2.231           0.025793
## z_shp_percent             0.0642920  0.0184583   3.483           0.000506
## z_shcb_percent           -0.0120509  0.0175943  -0.685           0.493466
## z_ACS_PCT_NO_VEH          0.0974811  0.0264069   3.692           0.000229
## z_ACS_PCT_RENTER_HH_CHILD -0.0172557  0.0106338  -1.623           0.104803
## z_ACS_PCT_RENT_COST_30PCT 0.0346776  0.0114636   3.025           0.002517
## z_ACS_PCT_MOBILE_HOME    -0.0068189  0.0119194  -0.572           0.567325
## z_ACS_PCT_OWNED_HH       -0.0720390  0.0153817  -4.683 0.0000030051299352
## z_ACS_PCT_OWNER_HH_CHILD -0.0135509  0.0154877  -0.875           0.381708
## z_ACS_MEDIAN_HOME_VALUE  -0.0437605  0.0176767  -2.476           0.013381
## z_hsg_rate                0.0546697  0.0090540   6.038 0.000000018436983
## z_sc_percent              0.0428262  0.0137688   3.110           0.001894
## z_ms_average              0.0104198  0.0158645   0.657           0.511383
## z_ACS_PCT_NO_PC          -0.0005280  0.0216201  -0.024           0.980520
## z_ACS_PCT_SMARTPHONE      0.0378154  0.0113404   3.335           0.000869
## z_ACS_PCT_BROADBAND       0.0047528  0.0214551   0.222           0.824706
## z_pphd_avgnum             0.1601791  0.0266147   6.018 0.0000000020787473
## z_pmhd_avgnum            -0.0059794  0.0236444  -0.253           0.800380
## z_lbw_percent_lbw         0.0004118  0.0124327   0.033           0.973579
## z_pi_phy_inact            0.0031437  0.0102923   0.305           0.760061
## z_cip_perc                0.0274611  0.0208514   1.317           0.187989
## z_csph_perc              -0.0139198  0.0147341  -0.945           0.344908
## z_ACS_PCT_CHILD_DISAB     0.0026994  0.0083511   0.323           0.746546
## z_phys_per_cap            0.0158100  0.0122262   1.293           0.196115
## z_mhp_per_cap             0.0084471  0.0107056   0.789           0.430184
## z_dents_per_cap           0.0360101  0.0122148   2.948           0.003234
## z_uninsur_perc            0.1573266  0.0123148  12.775 < 0.0000000000000002
## z_opcp_rate              -0.0373652  0.0095428  -3.916 0.0000931292126479
## z_TeenBirths              0.0628247  0.0223978   2.805           0.005080
## z_phs_rate               -0.0133967  0.0088109  -1.520           0.128548
## z_ms_perc_ann            -0.0760394  0.0100580  -7.560 0.0000000000000602
## z_AMFAR_AMATFAC           0.0130172  0.0097560   1.334           0.182259
## z_MP_PERCPEN             -0.0126058  0.0081630  -1.544           0.122680
## z_AHRF_RURAL_H_CLINIC     0.0113630  0.0072007   1.578           0.114710
## z_ACS_MEDIAN_HH_INCOME   -0.1190424  0.0252365  -4.717 0.0000025529643318
## z_ACS_PCT_WORK_NO_CAR    -0.0840934  0.0223315  -3.766           0.000171
## z_ACS_GINI_INDEX          0.0219901  0.0109612   2.006           0.044967
## z_unemp_perc              0.1549786  0.0115895  13.372 < 0.0000000000000002
## z_soc_assoc_num          -0.0483185  0.0247271  -1.954           0.050828
## z_aeo_perc_w_acc          0.0120857  0.0102235   1.182           0.237282
```

```
## z_dwv_presence            0.0281418  0.0074017   3.802              0.000148
## z_ACS_PCT_HH_PUB_ASSIST   -0.0326530  0.0098814  -3.305              0.000968
## z_AHRF_TXC_SITE_NO_CNTRL  -0.0112697  0.0076395  -1.475              0.140318
##
## (Intercept)               .
## z_ACS_PCT_BLACK           ***
## z_ACS_PCT_HISPAN          ***
## z_SVI_RPL_THEME1_SOCIECO
## z_SVI_RPL_THEME2_HH_DISB  .
## z_SVI_RPL_THEME3_MINO
## z_SVI_RPL_THEME4_HH_TRANS *
## z_ACS_PCT_ENGL_NOT_WELL   **
## z_ACS_PCT_NON_CITIZEN
## z_ACS_MEDIAN_AGE          **
## z_food_afford             ***
## z_fd_enviro_indx          ***
## z_ACS_PCT_FOOD_STAMP      *
## z_shp_percent             ***
## z_shcb_percent
## z_ACS_PCT_NO_VEH          ***
## z_ACS_PCT_RENTER_HH_CHILD
## z_ACS_PCT_RENT_COST_30PCT **
## z_ACS_PCT_MOBILE_HOME
## z_ACS_PCT_OWNED_HH        ***
## z_ACS_PCT_OWNER_HH_CHILD
## z_ACS_MEDIAN_HOME_VALUE   *
## z_hsg_rate                ***
## z_sc_percent              **
## z_ms_average
## z_ACS_PCT_NO_PC
## z_ACS_PCT_SMARTPHONE      ***
## z_ACS_PCT_BROADBAND
## z_pphd_avgnum             ***
## z_pmhd_avgnum
## z_lbw_percent_lbw
## z_pi_phy_inact
## z_cip_perc
## z_csph_perc
## z_ACS_PCT_CHILD_DISAB
## z_phys_per_cap
## z_mhp_per_cap
## z_dents_per_cap           **
## z_uninsur_perc            ***
## z_opcp_rate               ***
## z_TeenBirths              **
## z_phs_rate
## z_ms_perc_ann             ***
## z_AMFAR_AMATFAC
## z_MP_PERCPEN
## z_AHRF_RURAL_H_CLINIC
## z_ACS_MEDIAN_HH_INCOME    ***
## z_ACS_PCT_WORK_NO_CAR     ***
## z_ACS_GINI_INDEX          *
## z_unemp_perc              ***
```

```
## z_soc_assoc_num           .
## z_aeo_perc_w_acc
## z_dwv_presence            ***
## z_ACS_PCT_HH_PUB_ASSIST   ***
## z_AHRF_TXC_SITE_NO_CNTRL
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.313 on 2062 degrees of freedom
##   (1024 observations deleted due to missingness)
## Multiple R-squared:  0.9054, Adjusted R-squared:  0.903
## F-statistic: 365.6 on 54 and 2062 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Final Model

```
confint(z_fi_levels_12345678)
```

```
##                                2.5 %         97.5 %
## (Intercept)               -0.0010048783   0.0292619012
## z_ACS_PCT_BLACK            0.1999300984   0.2602697912
## z_ACS_PCT_HISPAN          -0.2705344778  -0.2091919443
## z_SVI_RPL_THEME1_SOCIECO  -0.0775818335   0.0098424721
## z_SVI_RPL_THEME2_HH_DISB  -0.0015904887   0.0474547442
## z_SVI_RPL_THEME3_MINO     -0.0120645706   0.0474413881
## z_SVI_RPL_THEME4_HH_TRANS  0.0003243717   0.0471427119
## z_ACS_PCT_ENGL_NOT_WELL   -0.1214663041  -0.0288542749
## z_ACS_PCT_NON_CITIZEN     -0.0215646001   0.0635970293
## z_ACS_MEDIAN_AGE          -0.0821118156  -0.0140032613
## z_food_afford             -0.0762143110  -0.0217213550
## z_fd_enviro_indx          -0.3747533666  -0.3209819802
## z_ACS_PCT_FOOD_STAMP       0.0050942672   0.0791472431
## z_shp_percent              0.0280931858   0.1004908790
## z_shcb_percent            -0.0465553176   0.0224536100
## z_ACS_PCT_NO_VEH           0.0456941101   0.1492680491
## z_ACS_PCT_RENTER_HH_CHILD -0.0381098326   0.0035984649
## z_ACS_PCT_RENT_COST_30PCT  0.0121961169   0.0571590577
## z_ACS_PCT_MOBILE_HOME     -0.0301942713   0.0165563853
## z_ACS_PCT_OWNED_HH        -0.1022043260  -0.0418736946
## z_ACS_PCT_OWNER_HH_CHILD  -0.0439241073   0.0168223859
## z_ACS_MEDIAN_HOME_VALUE   -0.0784264215  -0.0090945168
## z_hsg_rate                 0.0369137479   0.0724256453
## z_sc_percent               0.0158239381   0.0698284091
## z_ms_average              -0.0206923526   0.0415320209
## z_ACS_PCT_NO_PC           -0.0429273888   0.0418714740
## z_ACS_PCT_SMARTPHONE       0.0155755151   0.0600552024
## z_ACS_PCT_BROADBAND       -0.0373231486   0.0468288236
## z_pphd_avgnum              0.1079845347   0.2123736115
## z_pmhd_avgnum             -0.0523488321   0.0403900595
## z_lbw_percent_lbw         -0.0239701274   0.0247937742
## z_pi_phy_inact            -0.0170407682   0.0233281658
## z_cip_perc                -0.0134309623   0.0683530874
## z_csph_perc               -0.0428151437   0.0149755812
## z_ACS_PCT_CHILD_DISAB     -0.0136779848   0.0190767743
## z_phys_per_cap            -0.0081670753   0.0397869919
```

```
## z_mhp_per_cap             -0.0125478584  0.0294419653
## z_dents_per_cap            0.0120554851  0.0599646210
## z_uninsur_perc             0.1331757655  0.1814773438
## z_opcp_rate               -0.0560796297 -0.0186507213
## z_TeenBirths               0.0189000951  0.1067493090
## z_phs_rate                -0.0306760150  0.0038825555
## z_ms_perc_ann             -0.0957642754 -0.0563144370
## z_AMFAR_AMATFAC           -0.0061153825  0.0321498638
## z_MP_PERCPEN              -0.0286145017  0.0034028351
## z_AHRF_RURAL_H_CLINIC     -0.0027584008  0.0254843044
## z_ACS_MEDIAN_HH_INCOME    -0.1685340888 -0.0695507562
## z_ACS_PCT_WORK_NO_CAR     -0.1278880822 -0.0402987024
## z_ACS_GINI_INDEX           0.0004940028  0.0434861768
## z_unemp_perc               0.1322502300  0.1777069840
## z_soc_assoc_num           -0.0968110889  0.0001741342
## z_aeo_perc_w_acc          -0.0079637267  0.0321351859
## z_dwv_presence             0.0136262034  0.0426573798
## z_ACS_PCT_HH_PUB_ASSIST   -0.0520314168 -0.0132744836
## z_AHRF_TXC_SITE_NO_CNTRL  -0.0262516929  0.0037123453
```

VIF for Final Model

```r
vif(z_fi_levels_12345678)
```

```
##          z_ACS_PCT_BLACK        z_ACS_PCT_HISPAN  z_SVI_RPL_THEME1_SOCIECO
##                 5.983262                5.228346                 10.788460
##  z_SVI_RPL_THEME2_HH_DISB   z_SVI_RPL_THEME3_MINO  z_SVI_RPL_THEME4_HH_TRANS
##                 3.286183                4.679681                  2.923073
##  z_ACS_PCT_ENGL_NOT_WELL    z_ACS_PCT_NON_CITIZEN          z_ACS_MEDIAN_AGE
##                11.304048                9.194733                  5.811702
##            z_food_afford          z_fd_enviro_indx      z_ACS_PCT_FOOD_STAMP
##                 3.992247                3.424972                  6.907297
##            z_shp_percent           z_shcb_percent           z_ACS_PCT_NO_VEH
##                 4.659697                5.537561                  7.110449
## z_ACS_PCT_RENTER_HH_CHILD z_ACS_PCT_RENT_COST_30PCT    z_ACS_PCT_MOBILE_HOME
##                 2.250398                2.248080                  3.227880
##        z_ACS_PCT_OWNED_HH   z_ACS_PCT_OWNER_HH_CHILD  z_ACS_MEDIAN_HOME_VALUE
##                 4.356046                4.683710                  5.224637
##                z_hsg_rate             z_sc_percent               z_ms_average
##                 1.510133                3.832133                  1.815873
##          z_ACS_PCT_NO_PC      z_ACS_PCT_SMARTPHONE        z_ACS_PCT_BROADBAND
##                10.225912                2.814067                 10.120326
##            z_pphd_avgnum            z_pmhd_avgnum          z_lbw_percent_lbw
##                15.235621               11.834628                  3.410689
##            z_pi_phy_inact               z_cip_perc               z_csph_perc
##                 2.331946                9.870743                  4.518079
##      z_ACS_PCT_CHILD_DISAB           z_phys_per_cap              z_mhp_per_cap
##                 1.373879                2.666355                  2.104222
##           z_dents_per_cap            z_uninsur_perc               z_opcp_rate
##                 2.600235                3.450849                  1.763610
##               z_TeenBirths               z_phs_rate             z_ms_perc_ann
##                12.061121                1.624420                  2.092306
##           z_AMFAR_AMATFAC              z_MP_PERCPEN      z_AHRF_RURAL_H_CLINIC
##                 1.774199                1.355998                  1.192513
```

```
##      z_ACS_MEDIAN_HH_INCOME      z_ACS_PCT_WORK_NO_CAR           z_ACS_GINI_INDEX
##                    12.478142                   3.447379                   2.498324
##                 z_unemp_perc             z_soc_assoc_num             z_aeo_perc_w_acc
##                     2.303995                  13.337251                   2.065817
##              z_dwv_presence     z_ACS_PCT_HH_PUB_ASSIST     z_AHRF_TXC_SITE_NO_CNTRL
##                     1.155997                   1.496139                   1.065889
```

DV 2: Child Elig Lunch Perc

Note: Using New Variable (z_new_childelig), which incorporated the 2018 IL data

IV: Demographics (9 variables), DV: Child Elig Lunch Perc

```
z_ce_just_demos <- lm(formula = z_new_childelig ~ z_ACS_PCT_BLACK +
    z_ACS_PCT_HISPAN + z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB +
    z_SVI_RPL_THEME3_MINO + z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL +
    z_ACS_PCT_NON_CITIZEN + z_ACS_MEDIAN_AGE, data = Final_Variables_June_2024)
summary(z_ce_just_demos)
```

```
##
## Call:
## lm(formula = z_new_childelig ~ z_ACS_PCT_BLACK + z_ACS_PCT_HISPAN +
##     z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB + z_SVI_RPL_THEME3_MINO +
##     z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL + z_ACS_PCT_NON_CITIZEN +
##     z_ACS_MEDIAN_AGE, data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.1315 -0.2827  0.0237  0.3043  2.5612
##
## Coefficients:
##                             Estimate Std. Error t value         Pr(>|t|)
## (Intercept)                -0.008369   0.010668  -0.784         0.432824
## z_ACS_PCT_BLACK             0.223591   0.014177  15.771 < 0.0000000000000002 ***
## z_ACS_PCT_HISPAN            0.109669   0.018831   5.824     0.0000000063757 ***
## z_SVI_RPL_THEME1_SOCIECO    0.579802   0.017482  33.166 < 0.0000000000000002 ***
## z_SVI_RPL_THEME2_HH_DISB    0.096335   0.014762   6.526     0.0000000000795 ***
## z_SVI_RPL_THEME3_MINO       0.032989   0.019237   1.715         0.086468 .
## z_SVI_RPL_THEME4_HH_TRANS   0.052282   0.014167   3.690         0.000228 ***
## z_ACS_PCT_ENGL_NOT_WELL     0.055353   0.030261   1.829         0.067476 .
## z_ACS_PCT_NON_CITIZEN      -0.032402   0.027275  -1.188         0.234928
## z_ACS_MEDIAN_AGE            0.131422   0.012663  10.379 < 0.0000000000000002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.5752 on 2903 degrees of freedom
##   (228 observations deleted due to missingness)
## Multiple R-squared:  0.6696, Adjusted R-squared:  0.6686
## F-statistic: 653.7 on 9 and 2903 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Demographic IVs

```
confint(z_ce_just_demos)
```

```
##                                2.5 %      97.5 %
## (Intercept)               -0.029285840 0.01254857
## z_ACS_PCT_BLACK            0.195793019 0.25138923
## z_ACS_PCT_HISPAN           0.072746532 0.14659176
## z_SVI_RPL_THEME1_SOCIECO   0.545523732 0.61407939
## z_SVI_RPL_THEME2_HH_DISB   0.067390048 0.12528094
## z_SVI_RPL_THEME3_MINO     -0.004729738 0.07070825
## z_SVI_RPL_THEME4_HH_TRANS  0.024503206 0.08005987
## z_ACS_PCT_ENGL_NOT_WELL   -0.003982646 0.11468842
## z_ACS_PCT_NON_CITIZEN     -0.085881910 0.02107713
## z_ACS_MEDIAN_AGE           0.106593379 0.15625109
```

VIF for Demographic IVs

```
vif(z_ce_just_demos)
```

```
##          z_ACS_PCT_BLACK         z_ACS_PCT_HISPAN  z_SVI_RPL_THEME1_SOCIECO
##                 1.833868                 3.229070                  2.700473
##  z_SVI_RPL_THEME2_HH_DISB    z_SVI_RPL_THEME3_MINO  z_SVI_RPL_THEME4_HH_TRANS
##                 1.926917                 3.260374                  1.774129
##   z_ACS_PCT_ENGL_NOT_WELL    z_ACS_PCT_NON_CITIZEN          z_ACS_MEDIAN_AGE
##                 8.064458                 6.560753                  1.426428
```

IV: Food & Housing (12 variables), DV: Child Elig Lunch Perc

Note: FI Percent and Child Lunch Elig Removed from IVs

```
z_ce_just_foodhouse <- lm(formula = z_new_childelig ~
    z_food_afford + z_fd_enviro_indx + z_ACS_PCT_FOOD_STAMP +
        z_shp_percent + z_shcb_percent + z_ACS_PCT_NO_VEH +
        z_ACS_PCT_RENTER_HH_CHILD + z_ACS_PCT_RENT_COST_30PCT +
        z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH +
        z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE,
    data = Final_Variables_June_2024)
summary(z_ce_just_foodhouse)
```

```
##
## Call:
## lm(formula = z_new_childelig ~ z_food_afford + z_fd_enviro_indx +
##     z_ACS_PCT_FOOD_STAMP + z_shp_percent + z_shcb_percent + z_ACS_PCT_NO_VEH +
##     z_ACS_PCT_RENTER_HH_CHILD + z_ACS_PCT_RENT_COST_30PCT + z_ACS_PCT_MOBILE_HOME +
##     z_ACS_PCT_OWNED_HH + z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE,
##     data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.5786 -0.3406 -0.0085  0.3560  2.5904
##
## Coefficients:
##                       Estimate Std. Error t value          Pr(>|t|)
## (Intercept)          -0.004417   0.011967  -0.369           0.71209
## z_food_afford         0.100616   0.018904   5.322      0.000000111 ***
## z_fd_enviro_indx     -0.016332   0.016762  -0.974           0.32998
## z_ACS_PCT_FOOD_STAMP  0.319643   0.022201  14.398 < 0.0000000000000002 ***
```

```
## z_shp_percent                0.078278   0.021727   3.603                       0.00032 ***
## z_shcb_percent               0.067159   0.023742   2.829                       0.00471 **
## z_ACS_PCT_NO_VEH             0.025004   0.016430   1.522                       0.12815
## z_ACS_PCT_RENTER_HH_CHILD    0.168866   0.014179  11.910 < 0.0000000000000002 ***
## z_ACS_PCT_RENT_COST_30PCT    0.045506   0.017040   2.670                       0.00762 **
## z_ACS_PCT_MOBILE_HOME        0.182580   0.015919  11.469 < 0.0000000000000002 ***
## z_ACS_PCT_OWNED_HH          -0.088843   0.016648  -5.336             0.000000102 ***
## z_ACS_PCT_OWNER_HH_CHILD    -0.135323   0.014004  -9.663 < 0.0000000000000002 ***
## z_ACS_MEDIAN_HOME_VALUE     -0.164734   0.018025  -9.139 < 0.0000000000000002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6296 on 2779 degrees of freedom
##   (349 observations deleted due to missingness)
## Multiple R-squared:  0.6112, Adjusted R-squared:  0.6096
## F-statistic: 364.1 on 12 and 2779 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Food & Housing IVs

```
confint(z_ce_just_foodhouse)
```

```
##                                   2.5 %       97.5 %
## (Intercept)                -0.027880837   0.01904748
## z_food_afford               0.063548031   0.13768312
## z_fd_enviro_indx           -0.049200118   0.01653583
## z_ACS_PCT_FOOD_STAMP        0.276110820   0.36317450
## z_shp_percent               0.035676384   0.12087995
## z_shcb_percent              0.020604594   0.11371401
## z_ACS_PCT_NO_VEH           -0.007211431   0.05721961
## z_ACS_PCT_RENTER_HH_CHILD   0.141063471   0.19666862
## z_ACS_PCT_RENT_COST_30PCT   0.012092936   0.07891828
## z_ACS_PCT_MOBILE_HOME       0.151365476   0.21379502
## z_ACS_PCT_OWNED_HH         -0.121488036  -0.05619891
## z_ACS_PCT_OWNER_HH_CHILD   -0.162783269  -0.10786360
## z_ACS_MEDIAN_HOME_VALUE    -0.200077344  -0.12939163
```

VIF for Food & Housing IVs

```
vif(z_ce_just_foodhouse)
```

```
##             z_food_afford          z_fd_enviro_indx       z_ACS_PCT_FOOD_STAMP
##                  2.594363                  2.015803                   3.479392
##             z_shp_percent            z_shcb_percent            z_ACS_PCT_NO_VEH
##                  3.446652                  4.030466                   2.000930
## z_ACS_PCT_RENTER_HH_CHILD z_ACS_PCT_RENT_COST_30PCT      z_ACS_PCT_MOBILE_HOME
##                  1.436848                  2.044232                   1.809701
##        z_ACS_PCT_OWNED_HH  z_ACS_PCT_OWNER_HH_CHILD    z_ACS_MEDIAN_HOME_VALUE
##                  1.926445                  1.428560                   2.234662
```

IV: Education (3 variables), DV: Child Elig Lunch Perc

```
z_ce_just_ed <- lm(formula = z_new_childelig ~ z_hsg_rate + z_sc_percent +
    z_ms_average, data = Final_Variables_June_2024)
```

```
summary(z_ce_just_ed)
```

```
##
## Call:
## lm(formula = z_new_childelig ~ z_hsg_rate + z_sc_percent + z_ms_average,
##     data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.4001 -0.4717 -0.0709  0.4102  3.0179
##
## Coefficients:
##              Estimate Std. Error t value             Pr(>|t|)
## (Intercept)   0.02998    0.01549   1.935               0.0531 .
## z_hsg_rate   -0.23680    0.01696 -13.960 <0.0000000000000002 ***
## z_sc_percent -0.55067    0.01659 -33.183 <0.0000000000000002 ***
## z_ms_average -0.13951    0.01602  -8.709 <0.0000000000000002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.7411 on 2306 degrees of freedom
##   (831 observations deleted due to missingness)
## Multiple R-squared:  0.4333, Adjusted R-squared:  0.4326
## F-statistic: 587.8 on 3 and 2306 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Education IVs

```
confint(z_ce_just_ed)
```

```
##                      2.5 %      97.5 %
## (Intercept)  -0.0003961279  0.06035026
## z_hsg_rate   -0.2700652786 -0.20353862
## z_sc_percent -0.5832142986 -0.51812960
## z_ms_average -0.1709221134 -0.10809493
```

VIF for Education IVs

```
vif(z_ce_just_ed)
```

```
##   z_hsg_rate z_sc_percent z_ms_average
##     1.022385     1.083541     1.098628
```

IV: Technology (3 variables), DV: Child Elig Lunch Perc

```
z_ce_just_tech <- lm(formula = z_new_childelig ~ z_ACS_PCT_NO_PC +
    z_ACS_PCT_SMARTPHONE + z_ACS_PCT_BROADBAND, data = Final_Variables_June_2024)
summary(z_ce_just_tech)
```

```
##
## Call:
## lm(formula = z_new_childelig ~ z_ACS_PCT_NO_PC + z_ACS_PCT_SMARTPHONE +
##     z_ACS_PCT_BROADBAND, data = Final_Variables_June_2024)
##
```

```
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.1198 -0.4582 -0.0180  0.4546  2.8289
##
## Coefficients:
##                      Estimate Std. Error t value          Pr(>|t|)
## (Intercept)          0.003925   0.014070   0.279              0.78
## z_ACS_PCT_NO_PC      0.276683   0.036142   7.655   0.000000000000026 ***
## z_ACS_PCT_SMARTPHONE 0.299854   0.017478  17.156 < 0.0000000000000002 ***
## z_ACS_PCT_BROADBAND -0.172967   0.039455  -4.384   0.000012069310244 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.7595 on 2910 degrees of freedom
##   (227 observations deleted due to missingness)
## Multiple R-squared:  0.4238, Adjusted R-squared:  0.4232
## F-statistic: 713.5 on 3 and 2910 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Technology IVs

```
confint(z_ce_just_tech)
```

```
##                           2.5 %       97.5 %
## (Intercept)         -0.02366303  0.03151226
## z_ACS_PCT_NO_PC      0.20581678  0.34754929
## z_ACS_PCT_SMARTPHONE 0.26558464  0.33412420
## z_ACS_PCT_BROADBAND -0.25032969 -0.09560485
```

VIF for Technology IVs

```
vif(z_ce_just_tech)
```

```
##      z_ACS_PCT_NO_PC z_ACS_PCT_SMARTPHONE  z_ACS_PCT_BROADBAND
##             6.707421             1.578141             8.007672
```

IV: HWCC (7 variables), DV: Child Elig Lunch Perc

```
z_ce_just_HWCC <- lm(formula = z_new_childelig ~ z_pphd_avgnum +
    z_pmhd_avgnum + z_lbw_percent_lbw + z_pi_phy_inact + z_cip_perc +
    z_csph_perc + z_ACS_PCT_CHILD_DISAB, data = Final_Variables_June_2024)
summary(z_ce_just_HWCC)
```

```
##
## Call:
## lm(formula = z_new_childelig ~ z_pphd_avgnum + z_pmhd_avgnum +
##     z_lbw_percent_lbw + z_pi_phy_inact + z_cip_perc + z_csph_perc +
##     z_ACS_PCT_CHILD_DISAB, data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.6993 -0.2902  0.0037  0.3070  2.7257
##
## Coefficients:
##                       Estimate Std. Error t value          Pr(>|t|)
```

```
## (Intercept)            0.007999   0.010895   0.734                 0.462911
## z_pphd_avgnum          0.044071   0.035205   1.252                 0.210737
## z_pmhd_avgnum         -0.004139   0.031935  -0.130                 0.896882
## z_lbw_percent_lbw      0.053926   0.014415   3.741                 0.000187 ***
## z_pi_phy_inact         0.020342   0.013060   1.558                 0.119439
## z_cip_perc             0.605716   0.020918  28.956 < 0.0000000000000002 ***
## z_csph_perc            0.154131   0.016258   9.480 < 0.0000000000000002 ***
## z_ACS_PCT_CHILD_DISAB -0.039420   0.012133  -3.249                 0.001171 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.5769 on 2809 degrees of freedom
##   (324 observations deleted due to missingness)
## Multiple R-squared:  0.6578, Adjusted R-squared:  0.657
## F-statistic: 771.5 on 7 and 2809 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for HWCC IVs

```
confint(z_ce_just_HWCC)
```

```
##                              2.5 %       97.5 %
## (Intercept)           -0.013364049  0.02936113
## z_pphd_avgnum         -0.024959998  0.11310198
## z_pmhd_avgnum         -0.066757551  0.05847919
## z_lbw_percent_lbw      0.025662348  0.08219064
## z_pi_phy_inact        -0.005265722  0.04594968
## z_cip_perc             0.564699007  0.64673209
## z_csph_perc            0.122252761  0.18600919
## z_ACS_PCT_CHILD_DISAB -0.063210029 -0.01563014
```

VIF for HWCC IVs

```
vif(z_ce_just_HWCC)
```

```
##       z_pphd_avgnum        z_pmhd_avgnum    z_lbw_percent_lbw
##           10.566710             8.436583             1.777534
##      z_pi_phy_inact           z_cip_perc          z_csph_perc
##            1.486405             3.820988             2.170157
## z_ACS_PCT_CHILD_DISAB
##            1.170587
```

IV: Health A (6 variables), DV: Child Elig Lunch Perc

```
z_ce_just_healthA <- lm(formula = z_new_childelig ~ z_phys_per_cap +
    z_mhp_per_cap + z_dents_per_cap + z_uninsur_perc + z_opcp_rate +
    z_TeenBirths, data = Final_Variables_June_2024)
summary(z_ce_just_healthA)
```

```
##
## Call:
## lm(formula = z_new_childelig ~ z_phys_per_cap + z_mhp_per_cap +
##     z_dents_per_cap + z_uninsur_perc + z_opcp_rate + z_TeenBirths,
##     data = Final_Variables_June_2024)
##
```

```
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.2474 -0.5449 -0.0621  0.4729  2.8182
##
## Coefficients:
##                 Estimate Std. Error t value         Pr(>|t|)
## (Intercept)     0.003519   0.016354   0.215          0.82965
## z_phys_per_cap -0.125731   0.022984  -5.470    0.00000004874314 ***
## z_mhp_per_cap   0.019039   0.021471   0.887          0.37529
## z_dents_per_cap -0.146852  0.022294  -6.587    0.00000000005306 ***
## z_uninsur_perc  0.375497   0.016760  22.404 < 0.0000000000000002 ***
## z_opcp_rate     0.132161   0.018709   7.064    0.0000000000202 ***
## z_TeenBirths    0.045434   0.016959   2.679          0.00742 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8794 on 2887 degrees of freedom
##   (247 observations deleted due to missingness)
## Multiple R-squared:  0.2232, Adjusted R-squared:  0.2216
## F-statistic: 138.2 on 6 and 2887 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Health A IVs

```
confint(z_ce_just_healthA)
```

```
##                      2.5 %       97.5 %
## (Intercept)    -0.02854776  0.03558547
## z_phys_per_cap -0.17079744 -0.08066458
## z_mhp_per_cap  -0.02306045  0.06113817
## z_dents_per_cap -0.19056485 -0.10313921
## z_uninsur_perc  0.34263435  0.40836001
## z_opcp_rate     0.09547733  0.16884518
## z_TeenBirths    0.01218185  0.07868711
```

VIF for Health A IVs

```
vif(z_ce_just_healthA)
```

```
##  z_phys_per_cap   z_mhp_per_cap z_dents_per_cap  z_uninsur_perc     z_opcp_rate
##        1.960079        1.638513        1.862693        1.085271        1.319780
##    z_TeenBirths
##        1.137781
```

IV: Health B (5 variables), DV: Child Elig Lunch Perc

```
z_ce_just_healthB <- lm(formula = z_new_childelig ~ z_phs_rate +
    z_ms_perc_ann + z_AMFAR_AMATFAC + z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC,
    data = Final_Variables_June_2024)
summary(z_ce_just_healthB)
```

```
##
## Call:
## lm(formula = z_new_childelig ~ z_phs_rate + z_ms_perc_ann + z_AMFAR_AMATFAC +
##     z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC, data = Final_Variables_June_2024)
```

```
## 
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.4355 -0.5683 -0.0671  0.4387  3.2227
## 
## Coefficients:
##                      Estimate Std. Error t value           Pr(>|t|)
## (Intercept)           0.01522    0.01661   0.917             0.3593
## z_phs_rate            0.22318    0.01731  12.895 < 0.0000000000000002 ***
## z_ms_perc_ann        -0.31909    0.01760 -18.133 < 0.0000000000000002 ***
## z_AMFAR_AMATFAC       0.01296    0.01654   0.784             0.4332
## z_MP_PERCPEN          0.03333    0.01752   1.902             0.0573 .
## z_AHRF_RURAL_H_CLINIC 0.09790    0.01637   5.982       0.00000000248 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 0.8805 on 2809 degrees of freedom
##   (326 observations deleted due to missingness)
## Multiple R-squared:  0.2023, Adjusted R-squared:  0.2009
## F-statistic: 142.5 on 5 and 2809 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Health B IVs

```
confint(z_ce_just_healthB)
```

```
##                              2.5 %       97.5 %
## (Intercept)           -0.017336648  0.04778657
## z_phs_rate             0.189241917  0.25711508
## z_ms_perc_ann         -0.353598197 -0.28458918
## z_AMFAR_AMATFAC       -0.019465764  0.04539052
## z_MP_PERCPEN          -0.001028375  0.06769494
## z_AHRF_RURAL_H_CLINIC  0.065808086  0.12998744
```

VIF for Health B IVs

```
vif(z_ce_just_healthB)
```

```
##            z_phs_rate          z_ms_perc_ann        z_AMFAR_AMATFAC
##              1.088425               1.086829               1.033039
##          z_MP_PERCPEN z_AHRF_RURAL_H_CLINIC
##              1.084034               1.025207
```

IV: Business (4 variables), DV: Child Elig Lunch Perc

```
z_ce_just_bus <- lm(formula = z_new_childelig ~ z_ACS_MEDIAN_HH_INCOME +
    z_ACS_PCT_WORK_NO_CAR + z_ACS_GINI_INDEX + z_unemp_perc,
    data = Final_Variables_June_2024)
summary(z_ce_just_bus)
```

```
## 
## Call:
## lm(formula = z_new_childelig ~ z_ACS_MEDIAN_HH_INCOME + z_ACS_PCT_WORK_NO_CAR +
##     z_ACS_GINI_INDEX + z_unemp_perc, data = Final_Variables_June_2024)
## 
```

```
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.3330 -0.4141 -0.0262  0.3787  2.8349
##
## Coefficients:
##                          Estimate Std. Error t value      Pr(>|t|)
## (Intercept)             -0.002538   0.013122  -0.193         0.847
## z_ACS_MEDIAN_HH_INCOME  -0.512286   0.015199 -33.704 < 0.0000000000000002 ***
## z_ACS_PCT_WORK_NO_CAR    0.062462   0.013632   4.582       0.0000048 ***
## z_ACS_GINI_INDEX         0.152380   0.014529  10.488 < 0.0000000000000002 ***
## z_unemp_perc             0.189568   0.014799  12.809 < 0.0000000000000002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.7079 on 2908 degrees of freedom
##   (228 observations deleted due to missingness)
## Multiple R-squared:  0.4988, Adjusted R-squared:  0.4981
## F-statistic: 723.6 on 4 and 2908 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Business IVs

```
confint(z_ce_just_bus)
```

```
##                            2.5 %      97.5 %
## (Intercept)           -0.02826815  0.02319142
## z_ACS_MEDIAN_HH_INCOME -0.54208883 -0.48248314
## z_ACS_PCT_WORK_NO_CAR  0.03573249  0.08919227
## z_ACS_GINI_INDEX       0.12389216  0.18086787
## z_unemp_perc           0.16055009  0.21858663
```

VIF for Business IVs

```
vif(z_ce_just_bus)
```

```
## z_ACS_MEDIAN_HH_INCOME  z_ACS_PCT_WORK_NO_CAR      z_ACS_GINI_INDEX
##               1.360274               1.125909              1.215709
##           z_unemp_perc
##               1.315255
```

IV: Government (5 variables), DV: Child Elig Lunch Perc

```
z_ce_just_gov <- lm(formula = z_new_childelig ~ z_soc_assoc_num +
    z_aeo_perc_w_acc + z_dwv_presence + z_ACS_PCT_HH_PUB_ASSIST +
    z_AHRF_TXC_SITE_NO_CNTRL, data = Final_Variables_June_2024)
summary(z_ce_just_gov)
```

```
##
## Call:
## lm(formula = z_new_childelig ~ z_soc_assoc_num + z_aeo_perc_w_acc +
##     z_dwv_presence + z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL,
##     data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
```

```
## -4.1849 -0.6465 -0.0868  0.5456  2.8989
##
## Coefficients:
##                            Estimate Std. Error t value           Pr(>|t|)
## (Intercept)              -0.0058763  0.0174084  -0.338             0.7357
## z_soc_assoc_num           0.0353707  0.0188684   1.875             0.0609 .
## z_aeo_perc_w_acc         -0.2984585  0.0187121 -15.950 <0.0000000000000002 ***
## z_dwv_presence           -0.0003689  0.0176342  -0.021             0.9833
## z_ACS_PCT_HH_PUB_ASSIST   0.2159649  0.0179623  12.023 <0.0000000000000002 ***
## z_AHRF_TXC_SITE_NO_CNTRL -0.0085000  0.0175592  -0.484             0.6284
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9317 on 2859 degrees of freedom
##   (276 observations deleted due to missingness)
## Multiple R-squared:  0.1208, Adjusted R-squared:  0.1192
## F-statistic: 78.53 on 5 and 2859 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Government IVs

```
confint(z_ce_just_gov)
```

```
##                               2.5 %       97.5 %
## (Intercept)             -0.040010575  0.02825788
## z_soc_assoc_num         -0.001626363  0.07236769
## z_aeo_perc_w_acc        -0.335149055 -0.26176804
## z_dwv_presence          -0.034945963  0.03420807
## z_ACS_PCT_HH_PUB_ASSIST  0.180744419  0.25118529
## z_AHRF_TXC_SITE_NO_CNTRL -0.042930106  0.02593004
```

VIF for Government IVs

```
vif(z_ce_just_gov)
```

```
##         z_soc_assoc_num         z_aeo_perc_w_acc           z_dwv_presence
##                1.195388                1.147209                 1.030479
##   z_ACS_PCT_HH_PUB_ASSIST z_AHRF_TXC_SITE_NO_CNTRL
##                1.013951                1.066425
```

Final Food Model, DV: Child Elig Lunch Perc; IVs: 54

```
z_ce_levels_12345678 <- lm(formula = z_new_childelig ~ z_ACS_PCT_BLACK +
    z_ACS_PCT_HISPAN + z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB +
    z_SVI_RPL_THEME3_MINO + z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL +
    z_ACS_PCT_NON_CITIZEN + z_ACS_MEDIAN_AGE + z_food_afford +
    z_fd_enviro_indx + z_ACS_PCT_FOOD_STAMP + z_shp_percent +
    z_shcb_percent + z_ACS_PCT_NO_VEH + z_ACS_PCT_RENTER_HH_CHILD +
    z_ACS_PCT_RENT_COST_30PCT + z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH +
    z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE + z_hsg_rate +
    z_sc_percent + z_ms_average + z_ACS_PCT_NO_PC + z_ACS_PCT_SMARTPHONE +
    z_ACS_PCT_BROADBAND + z_pphd_avgnum + z_pmhd_avgnum + z_lbw_percent_lbw +
    z_pi_phy_inact + z_cip_perc + z_csph_perc + z_ACS_PCT_CHILD_DISAB +
    z_phys_per_cap + z_mhp_per_cap + z_dents_per_cap + z_uninsur_perc +
```

```
    z_opcp_rate + z_TeenBirths + z_phs_rate + z_ms_perc_ann +
    z_AMFAR_AMATFAC + z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC +
    z_ACS_MEDIAN_HH_INCOME + z_ACS_PCT_WORK_NO_CAR + z_ACS_GINI_INDEX +
    z_unemp_perc + z_soc_assoc_num + z_aeo_perc_w_acc + z_dwv_presence +
    z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL, data = Final_Variables_June_2024)
summary(z_ce_levels_12345678)
```

```
##
## Call:
## lm(formula = z_new_childelig ~ z_ACS_PCT_BLACK + z_ACS_PCT_HISPAN +
##     z_SVI_RPL_THEME1_SOCIECO + z_SVI_RPL_THEME2_HH_DISB + z_SVI_RPL_THEME3_MINO +
##     z_SVI_RPL_THEME4_HH_TRANS + z_ACS_PCT_ENGL_NOT_WELL + z_ACS_PCT_NON_CITIZEN +
##     z_ACS_MEDIAN_AGE + z_food_afford + z_fd_enviro_indx + z_ACS_PCT_FOOD_STAMP +
##     z_shp_percent + z_shcb_percent + z_ACS_PCT_NO_VEH + z_ACS_PCT_RENTER_HH_CHILD +
##     z_ACS_PCT_RENT_COST_30PCT + z_ACS_PCT_MOBILE_HOME + z_ACS_PCT_OWNED_HH +
##     z_ACS_PCT_OWNER_HH_CHILD + z_ACS_MEDIAN_HOME_VALUE + z_hsg_rate +
##     z_sc_percent + z_ms_average + z_ACS_PCT_NO_PC + z_ACS_PCT_SMARTPHONE +
##     z_ACS_PCT_BROADBAND + z_pphd_avgnum + z_pmhd_avgnum + z_lbw_percent_lbw +
##     z_pi_phy_inact + z_cip_perc + z_csph_perc + z_ACS_PCT_CHILD_DISAB +
##     z_phys_per_cap + z_mhp_per_cap + z_dents_per_cap + z_uninsur_perc +
##     z_opcp_rate + z_TeenBirths + z_phs_rate + z_ms_perc_ann +
##     z_AMFAR_AMATFAC + z_MP_PERCPEN + z_AHRF_RURAL_H_CLINIC +
##     z_ACS_MEDIAN_HH_INCOME + z_ACS_PCT_WORK_NO_CAR + z_ACS_GINI_INDEX +
##     z_unemp_perc + z_soc_assoc_num + z_aeo_perc_w_acc + z_dwv_presence +
##     z_ACS_PCT_HH_PUB_ASSIST + z_AHRF_TXC_SITE_NO_CNTRL, data = Final_Variables_June_2024)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.4622 -0.2669  0.0209  0.2769  2.0564
##
## Coefficients:
##                             Estimate  Std. Error  t value          Pr(>|t|)
## (Intercept)               -0.02961268  0.01239106  -2.390          0.016946
## z_ACS_PCT_BLACK            0.11060906  0.02459337   4.498     0.0000072604847
## z_ACS_PCT_HISPAN          -0.00510279  0.02512581  -0.203          0.839085
## z_SVI_RPL_THEME1_SOCIECO   0.20474536  0.03567863   5.739     0.0000000109705
## z_SVI_RPL_THEME2_HH_DISB   0.03494739  0.01995273   1.752          0.080008
## z_SVI_RPL_THEME3_MINO     -0.00667244  0.02431126  -0.274          0.783760
## z_SVI_RPL_THEME4_HH_TRANS  0.00045461  0.01920579   0.024          0.981118
## z_ACS_PCT_ENGL_NOT_WELL    0.02200932  0.03791169   0.581          0.561613
## z_ACS_PCT_NON_CITIZEN      0.06699243  0.03468517   1.931          0.053566
## z_ACS_MEDIAN_AGE          -0.02678430  0.02786928  -0.961          0.336631
## z_food_afford             -0.08976682  0.02221462  -4.041     0.0000552183610
## z_fd_enviro_indx           0.14513888  0.02193450   6.617     0.0000000000467
## z_ACS_PCT_FOOD_STAMP       0.17025182  0.03012742   5.651     0.0000000181789
## z_shp_percent              0.03425074  0.02948590   1.162          0.245535
## z_shcb_percent             0.02025211  0.02809279   0.721          0.471053
## z_ACS_PCT_NO_VEH           0.14994661  0.04268001   3.513          0.000452
## z_ACS_PCT_RENTER_HH_CHILD  0.01843158  0.01704187   1.082          0.279581
## z_ACS_PCT_RENT_COST_30PCT -0.04669172  0.01832268  -2.548          0.010897
## z_ACS_PCT_MOBILE_HOME      0.03086838  0.01909904   1.616          0.106200
## z_ACS_PCT_OWNED_HH         0.03324258  0.02473963   1.344          0.179195
## z_ACS_PCT_OWNER_HH_CHILD  -0.05322878  0.02473413  -2.152          0.031511
## z_ACS_MEDIAN_HOME_VALUE   -0.05360591  0.03067611  -1.747          0.080704
```

```
## z_hsg_rate                -0.07158478  0.01451537  -4.932         0.0000008811239
## z_sc_percent               0.01107942  0.02199795   0.504                0.614557
## z_ms_average              -0.10247302  0.02531153  -4.048         0.0000534735627
## z_ACS_PCT_NO_PC           -0.04074570  0.03462311  -1.177                0.239398
## z_ACS_PCT_SMARTPHONE      -0.07919112  0.01808972  -4.378         0.0000125994039
## z_ACS_PCT_BROADBAND       -0.05807806  0.03423523  -1.696                0.089955
## z_pphd_avgnum             -0.17976071  0.04262244  -4.218         0.0000257788026
## z_pmhd_avgnum              0.17993431  0.03786767   4.752         0.0000021579043
## z_lbw_percent_lbw          0.05054942  0.01988753   2.542                0.011103
## z_pi_phy_inact             0.00005817  0.01647024   0.004                0.997182
## z_cip_perc                 0.19062739  0.03326519   5.731         0.0000000114963
## z_csph_perc                0.04738184  0.02352146   2.014                0.044097
## z_ACS_PCT_CHILD_DISAB     -0.03042340  0.01331862  -2.284                0.022457
## z_phys_per_cap            -0.05233086  0.01959224  -2.671                0.007623
## z_mhp_per_cap             -0.00774771  0.01718973  -0.451                0.652241
## z_dents_per_cap            0.04072897  0.01951007   2.088                0.036959
## z_uninsur_perc             0.25718774  0.01971977  13.042 < 0.0000000000000002
## z_opcp_rate                0.01105341  0.01525588   0.725                0.468821
## z_TeenBirths               0.01788996  0.03922791   0.456                0.648401
## z_phs_rate                -0.00885498  0.01412353  -0.627                0.530751
## z_ms_perc_ann              0.04593813  0.01613074   2.848                0.004445
## z_AMFAR_AMATFAC            0.00963292  0.01675240   0.575                0.565343
## z_MP_PERCPEN               0.00387213  0.01315466   0.294                0.768517
## z_AHRF_RURAL_H_CLINIC      0.02061609  0.01149251   1.794                0.072981
## z_ACS_MEDIAN_HH_INCOME    -0.09746529  0.04083169  -2.387                0.017077
## z_ACS_PCT_WORK_NO_CAR     -0.11903237  0.03577768  -3.327                0.000893
## z_ACS_GINI_INDEX          -0.02510572  0.01747147  -1.437                0.150884
## z_unemp_perc               0.07808176  0.01851660   4.217         0.0000258537548
## z_soc_assoc_num           -0.01143617  0.04415947  -0.259                0.795681
## z_aeo_perc_w_acc          -0.01869323  0.01631183  -1.146                0.251932
## z_dwv_presence            -0.06691421  0.01183690  -5.653         0.0000000179759
## z_ACS_PCT_HH_PUB_ASSIST    0.00816785  0.01575576   0.518                0.604233
## z_AHRF_TXC_SITE_NO_CNTRL   0.02087443  0.01228057   1.700                0.089322
##
## (Intercept)              *
## z_ACS_PCT_BLACK          ***
## z_ACS_PCT_HISPAN
## z_SVI_RPL_THEME1_SOCIECO ***
## z_SVI_RPL_THEME2_HH_DISB .
## z_SVI_RPL_THEME3_MINO
## z_SVI_RPL_THEME4_HH_TRANS
## z_ACS_PCT_ENGL_NOT_WELL
## z_ACS_PCT_NON_CITIZEN    .
## z_ACS_MEDIAN_AGE
## z_food_afford            ***
## z_fd_enviro_indx         ***
## z_ACS_PCT_FOOD_STAMP     ***
## z_shp_percent
## z_shcb_percent
## z_ACS_PCT_NO_VEH         ***
## z_ACS_PCT_RENTER_HH_CHILD
## z_ACS_PCT_RENT_COST_30PCT *
## z_ACS_PCT_MOBILE_HOME
## z_ACS_PCT_OWNED_HH
```

```
## z_ACS_PCT_OWNER_HH_CHILD    *
## z_ACS_MEDIAN_HOME_VALUE     .
## z_hsg_rate                 ***
## z_sc_percent
## z_ms_average               ***
## z_ACS_PCT_NO_PC
## z_ACS_PCT_SMARTPHONE        ***
## z_ACS_PCT_BROADBAND         .
## z_pphd_avgnum              ***
## z_pmhd_avgnum              ***
## z_lbw_percent_lbw           *
## z_pi_phy_inact
## z_cip_perc                 ***
## z_csph_perc                 *
## z_ACS_PCT_CHILD_DISAB       *
## z_phys_per_cap             **
## z_mhp_per_cap
## z_dents_per_cap             *
## z_uninsur_perc             ***
## z_opcp_rate
## z_TeenBirths
## z_phs_rate
## z_ms_perc_ann              **
## z_AMFAR_AMATFAC
## z_MP_PERCPEN
## z_AHRF_RURAL_H_CLINIC       .
## z_ACS_MEDIAN_HH_INCOME      *
## z_ACS_PCT_WORK_NO_CAR      ***
## z_ACS_GINI_INDEX
## z_unemp_perc               ***
## z_soc_assoc_num
## z_aeo_perc_w_acc
## z_dwv_presence             ***
## z_ACS_PCT_HH_PUB_ASSIST
## z_AHRF_TXC_SITE_NO_CNTRL    .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4982 on 2045 degrees of freedom
##   (1041 observations deleted due to missingness)
## Multiple R-squared:  0.7504, Adjusted R-squared:  0.7438
## F-statistic: 113.9 on 54 and 2045 DF,  p-value: < 0.00000000000000022
```

Confidence Intervals for Final Model

```
confint(z_ce_levels_12345678)
```

```
##                               2.5 %        97.5 %
## (Intercept)             -0.053913094 -0.005312261
## z_ACS_PCT_BLACK          0.062378401  0.158839717
## z_ACS_PCT_HISPAN        -0.054377628  0.044172054
## z_SVI_RPL_THEME1_SOCIECO  0.134775115  0.274715607
## z_SVI_RPL_THEME2_HH_DISB -0.004182403  0.074077177
## z_SVI_RPL_THEME3_MINO    -0.054349845  0.041004973
```

```
## z_SVI_RPL_THEME4_HH_TRANS -0.037210334  0.038119559
## z_ACS_PCT_ENGL_NOT_WELL    -0.052340236  0.096358867
## z_ACS_PCT_NON_CITIZEN      -0.001029513  0.135014375
## z_ACS_MEDIAN_AGE           -0.081439428  0.027870819
## z_food_afford              -0.133332458 -0.046201178
## z_fd_enviro_indx            0.102122591  0.188155172
## z_ACS_PCT_FOOD_STAMP        0.111168197  0.229335450
## z_shp_percent              -0.023574781  0.092076259
## z_shcb_percent             -0.034841356  0.075345570
## z_ACS_PCT_NO_VEH            0.066245801  0.233647425
## z_ACS_PCT_RENTER_HH_CHILD  -0.014989644  0.051852806
## z_ACS_PCT_RENT_COST_30PCT  -0.082624787 -0.010758648
## z_ACS_PCT_MOBILE_HOME      -0.006587227  0.068323990
## z_ACS_PCT_OWNED_HH         -0.015274928  0.081760085
## z_ACS_PCT_OWNER_HH_CHILD   -0.101735485 -0.004722078
## z_ACS_MEDIAN_HOME_VALUE    -0.113765600  0.006553771
## z_hsg_rate                 -0.100051225 -0.043118327
## z_sc_percent               -0.032061315  0.054220145
## z_ms_average               -0.152112077 -0.052833956
## z_ACS_PCT_NO_PC            -0.108645940  0.027154532
## z_ACS_PCT_SMARTPHONE       -0.114667310 -0.043714928
## z_ACS_PCT_BROADBAND        -0.125217622  0.009061502
## z_pphd_avgnum              -0.263348630 -0.096172782
## z_pmhd_avgnum               0.105671091  0.254197522
## z_lbw_percent_lbw           0.011547495  0.089551354
## z_pi_phy_inact             -0.032242028  0.032358375
## z_cip_perc                  0.125390194  0.255864576
## z_csph_perc                 0.001253330  0.093510358
## z_ACS_PCT_CHILD_DISAB      -0.056542871 -0.004303930
## z_phys_per_cap             -0.090753689 -0.013908027
## z_mhp_per_cap              -0.041458921  0.025963503
## z_dents_per_cap             0.002467291  0.078990654
## z_uninsur_perc              0.218514818  0.295860666
## z_opcp_rate                -0.018865274  0.040972084
## z_TeenBirths               -0.059040865  0.094820781
## z_phs_rate                 -0.036552986  0.018843026
## z_ms_perc_ann               0.014303727  0.077572529
## z_AMFAR_AMATFAC            -0.023220632  0.042486463
## z_MP_PERCPEN               -0.021925786  0.029670052
## z_AHRF_RURAL_H_CLINIC      -0.001922152  0.043154324
## z_ACS_MEDIAN_HH_INCOME     -0.177541321 -0.017389254
## z_ACS_PCT_WORK_NO_CAR      -0.189196858 -0.048867890
## z_ACS_GINI_INDEX           -0.059369455  0.009158024
## z_unemp_perc                0.041768405  0.114395124
## z_soc_assoc_num            -0.098038401  0.075166071
## z_aeo_perc_w_acc           -0.050682764  0.013296300
## z_dwv_presence             -0.090127851 -0.043700577
## z_ACS_PCT_HH_PUB_ASSIST    -0.022731169  0.039066864
## z_AHRF_TXC_SITE_NO_CNTRL   -0.003209305  0.044958166
```

VIF for Final Model

```
vif(z_ce_levels_12345678)
```

```
##           z_ACS_PCT_BLACK          z_ACS_PCT_HISPAN z_SVI_RPL_THEME1_SOCIECO
##                  5.979618                  5.309043                 10.794213
##    z_SVI_RPL_THEME2_HH_DISB   z_SVI_RPL_THEME3_MINO  z_SVI_RPL_THEME4_HH_TRANS
##                  3.258123                  4.695105                  2.953138
##       z_ACS_PCT_ENGL_NOT_WELL    z_ACS_PCT_NON_CITIZEN          z_ACS_MEDIAN_AGE
##                 11.335878                  9.115693                  5.865487
##             z_food_afford           z_fd_enviro_indx       z_ACS_PCT_FOOD_STAMP
##                  3.997840                  3.428386                  6.862448
##             z_shp_percent            z_shcb_percent          z_ACS_PCT_NO_VEH
##                  4.615376                  5.439196                  6.721881
##   z_ACS_PCT_RENTER_HH_CHILD z_ACS_PCT_RENT_COST_30PCT    z_ACS_PCT_MOBILE_HOME
##                  2.252762                  2.248530                  3.232239
##         z_ACS_PCT_OWNED_HH   z_ACS_PCT_OWNER_HH_CHILD   z_ACS_MEDIAN_HOME_VALUE
##                  4.344860                  4.690748                  5.441178
##                 z_hsg_rate              z_sc_percent              z_ms_average
##                  1.511010                  3.806315                  1.813085
##              z_ACS_PCT_NO_PC       z_ACS_PCT_SMARTPHONE        z_ACS_PCT_BROADBAND
##                 10.219999                  2.809922                 10.045292
##              z_pphd_avgnum             z_pmhd_avgnum           z_lbw_percent_lbw
##                 15.325267                 11.922843                  3.427374
##              z_pi_phy_inact               z_cip_perc               z_csph_perc
##                  2.334607                  9.810196                  4.506295
##        z_ACS_PCT_CHILD_DISAB            z_phys_per_cap             z_mhp_per_cap
##                  1.373023                  2.669718                  2.042447
##            z_dents_per_cap             z_uninsur_perc               z_opcp_rate
##                  2.546496                  3.438883                  1.756922
##               z_TeenBirths               z_phs_rate             z_ms_perc_ann
##                 14.447391                  1.639886                  2.095789
##             z_AMFAR_AMATFAC               z_MP_PERCPEN     z_AHRF_RURAL_H_CLINIC
##                  1.845235                  1.380632                  1.194721
##      z_ACS_MEDIAN_HH_INCOME     z_ACS_PCT_WORK_NO_CAR          z_ACS_GINI_INDEX
##                 12.577679                  3.116459                  2.484306
##              z_unemp_perc            z_soc_assoc_num             z_aeo_perc_w_acc
##                  2.304662                 15.970961                  2.050737
##             z_dwv_presence   z_ACS_PCT_HH_PUB_ASSIST   z_AHRF_TXC_SITE_NO_CNTRL
##                  1.155805                  1.492225                  1.066706
```