Final report for ADA

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Data set: cross sectional data format from 2008, 2010, 2012, 2014

# Load the package and read data

# Read Stata data

-Read Stata [data:`rndhrs\_mergeall2.dta](data:%60rndhrs_mergeall2.dta)` - This data set include 2008,2010,2012 and 2014 HRS

data<-read.csv("D:/Dropbox/@2018 Spring/ADA/Final proposal/Data/rndhrs\_merge2.csv",header=TRUE, sep=",")

# Descriptive statistics

demographic characteristics which include age, gender, race (non-Hispanic White, non-Hispanic Black, Hispanic, and other), education levels, and marital status. Covariates related to health status and health insurance include: activities of daily living (ADLs), and instrumental activities of daily living (IADLs), and number of chronic disease, medical care utilization (hospital stays), medical expenditure (out-of pocket), and health insurance coverage. The main stratification variable of interest is respondents’ living arrangements, which is constructed as a four-category variable (living alone , living with spouse only, living with spouse and others, and living with others only) combing household composition and marital status, following the previous studies. 1,18 The detailed descriptions of living arrangement are included in the following sections.

Follow the baby boomers 1946-1964 (who were 44-62 in 2008). Since the HRS only cover who were over 50 years old. I follow cohort who were born durig 1946- 1958 (who were 50-62 years old)

data$age[which((data$age>62|data$age<50) &data$year=="2008")]<-NA  
describe.by(data$age,data$year)

## Warning: describe.by is deprecated. Please use the describeBy function

##   
## Descriptive statistics by group   
## group: 2008  
## vars n mean sd median trimmed mad min max range skew kurtosis  
## X1 1 3961 57.25 3.08 57 57.4 2.97 50 62 12 -0.32 -0.66  
## se  
## X1 0.05  
## --------------------------------------------------------   
## group: 2010  
## vars n mean sd median trimmed mad min max range skew kurtosis  
## X1 1 4651 60.9 3.95 61 60.97 4.45 51 68 17 -0.11 -0.81  
## se  
## X1 0.06  
## --------------------------------------------------------   
## group: 2012  
## vars n mean sd median trimmed mad min max range skew kurtosis  
## X1 1 4373 62.87 3.93 63 62.95 4.45 53 70 17 -0.12 -0.85  
## se  
## X1 0.06  
## --------------------------------------------------------   
## group: 2014  
## vars n mean sd median trimmed mad min max range skew kurtosis  
## X1 1 4087 64.71 3.93 65 64.79 4.45 55 72 17 -0.12 -0.84  
## se  
## X1 0.06

sum(is.na(data$age))

## [1] 1083

data<- data[-which(is.na(data$age)), ] # 17072 observations left

Dependent variable: serious psychological distress (depression) r\_cesd

# RwCESD is the sum of RwDEPRES, RwEFFORT, RwSLEEPR, RwFLONE, RwFSAD, RwGOING, (1-RwWHAPPY)  
#and (1-RwENLIFE). Thus the higher the score, the more negative the Respondent's feelings in the past week.   
# min=0, max=8  
# generate new variable, 0-2, 3-7,8  
data$r\_cesd<-as.numeric(data$r\_cesd)  
r\_cesd<-as.numeric(data$r\_cesd)  
data$r\_cesd\_order<-ifelse(data$r\_cesd>=0 & data$r\_cesd<3,0,  
 ifelse(data$r\_cesd>=3 & data$r\_cesd<8,1,  
 ifelse(data$r\_cesd>=8,2,NA)))  
data$r\_cesd\_order<-factor(data$r\_cesd\_order, levels = c(0,1,2), labels = c("Low CESD","Middle CESD","High CESD"))  
r\_cesd\_order <- ordered(data$r\_cesd\_order,c("Low CESD","Middle CESD","High CESD"))   
summary(r\_cesd\_order)

## Low CESD Middle CESD High CESD NA's   
## 13275 2845 262 690

Independent variables

# household ID  
ï..hhidpn<-as.factor(data$ï..hhidpn)  
length(unique(ï..hhidpn)) # there are 5253 unique cohort

## [1] 5253

# Retirement decision  
r\_retire<-as.factor(data$r\_retire)  
t.test(r\_cesd~r\_retire) # there is difference in CESD among retirement groups

##   
## Welch Two Sample t-test  
##   
## data: r\_cesd by r\_retire  
## t = -12.366, df = 8635.2, p-value < 2.2e-16  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -0.4993565 -0.3627023  
## sample estimates:  
## mean in group 0 mean in group 1   
## 1.186347 1.617376

year<-as.factor(data$year)  
summary(year)

## 2008 2010 2012 2014   
## 3961 4651 4373 4087

library(dplyr)

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:plm':  
##   
## between, lag, lead

## The following objects are masked from 'package:Hmisc':  
##   
## src, summarize

## The following objects are masked from 'package:data.table':  
##   
## between, first, last

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

data %>% group\_by(ï..hhidpn) %>% filter(row\_number(year) == 4)

## # A tibble: 2,847 x 59  
## # Groups: ï..hhidpn [2,847]  
## ï..hhidpn year age gender race rahispan raeduc r\_adla r\_iadla  
## <int> <int> <int> <fct> <fct> <fct> <fct> <int> <int>  
## 1 10013040 2014 66 2.fema~ 1.white~ 0.not h~ 4.some ~ 0 0  
## 2 10708030 2014 67 2.fema~ 2.black~ 0.not h~ 3.high-~ 4 0  
## 3 10818040 2014 65 2.fema~ 1.white~ 0.not h~ 4.some ~ 0 0  
## 4 10822040 2014 67 2.fema~ 1.white~ 0.not h~ 4.some ~ 0 0  
## 5 11256040 2014 67 2.fema~ 3.other 0.not h~ 1.lt hi~ 0 0  
## 6 11377040 2014 68 2.fema~ 1.white~ 0.not h~ 3.high-~ 0 0  
## 7 11466040 2014 61 2.fema~ 2.black~ 0.not h~ 1.lt hi~ 0 0  
## 8 11626011 2014 65 2.fema~ 3.other 1.hispa~ 1.lt hi~ 0 0  
## 9 11911040 2014 66 2.fema~ 1.white~ 0.not h~ 3.high-~ 0 0  
## 10 12481011 2014 68 2.fema~ 3.other 1.hispa~ 4.some ~ 0 0  
## # ... with 2,837 more rows, and 50 more variables: rabyear <int>,  
## # radyear <int>, r\_cesd <dbl>, r\_cesdm <int>, r\_cholst <fct>,  
## # r\_breast <fct>, r\_bmi <dbl>, r\_height <dbl>, r\_weight <dbl>,  
## # r\_smokev <fct>, r\_smoken <fct>, r\_drink <fct>, r\_drinkd <fct>,  
## # r\_drinkn <fct>, r\_diab <fct>, r\_cancr <fct>, r\_heart <fct>,  
## # r\_govmr <fct>, r\_govmd <fct>, r\_hiothp <fct>, r\_psych <fct>,  
## # r\_arthr <fct>, r\_walkr <fct>, r\_adlc <int>, r\_hosp <fct>,  
## # r\_outpt <fct>, r\_drugs <fct>, r\_oopmd <dbl>, r\_dlrc <int>,  
## # h\_itot <dbl>, h\_inpova <fct>, h\_inpov <fct>, r\_work <fct>,  
## # r\_work2 <fct>, r\_slfemp <fct>, r\_demens <fct>, r\_alzhef <fct>,  
## # r\_alzhes <fct>, r\_demenf <fct>, LA\_partnered <int>, r\_married <int>,  
## # r\_diabetes <int>, r\_retire <int>, num\_chronic <int>,  
## # r\_hypertension <int>, r\_mstat <fct>, r\_nrstim <int>, r\_ipena <dbl>,  
## # r\_doctim <int>, r\_cesd\_order <fct>

#http://www.matthieugomez.com/statar/group-by.html  
  
  
# Age  
age<-as.numeric(data$age)  
summary(age)

## Min. 1st Qu. Median Mean 3rd Qu. Max.   
## 50.00 58.00 61.00 61.47 65.00 72.00

cor.test(r\_cesd,age)

##   
## Pearson's product-moment correlation  
##   
## data: r\_cesd and age  
## t = -7.0363, df = 16380, p-value = 2.052e-12  
## alternative hypothesis: true correlation is not equal to 0  
## 95 percent confidence interval:  
## -0.07014931 -0.03961486  
## sample estimates:  
## cor   
## -0.05489492

# Gender  
data$gender<-as.factor(data$gender)  
gender<-relevel(data$gender, ref="1.male")  
summary(gender)

## 1.male 2.female   
## 6938 10134

t.test(r\_cesd~gender)

##   
## Welch Two Sample t-test  
##   
## data: r\_cesd by gender  
## t = -10.654, df = 15107, p-value < 2.2e-16  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -0.3829212 -0.2639207  
## sample estimates:  
## mean in group 1.male mean in group 2.female   
## 1.132006 1.455427

#\*1: non hispanic white, 2: non-hispanic black, 3: Hispanic, 4: other\*  
  
data$race<-ifelse(data$race=="1.white/caucasian",0,  
 ifelse(data$race=="2.black/african american",1,  
 ifelse(data$race=="3.other",2,NA)))  
data$race<-factor(data$race,levels=c(0,1,2),labels=c("White/Caucasian","Black/African American","Other"))  
race<-relevel(data$race,ref="White/Caucasian")  
summary(race)

## White/Caucasian Black/African American Other   
## 13311 2303 1455   
## NA's   
## 3

kruskal.test(r\_cesd,race)

##   
## Kruskal-Wallis rank sum test  
##   
## data: r\_cesd and race  
## Kruskal-Wallis chi-squared = 275.99, df = 2, p-value < 2.2e-16

# Insurance  
r\_govmr<-as.factor(data$r\_govmr)   
r\_govmd<-as.factor(data$r\_govmr)  
r\_hiothp<-as.factor(data$r\_hiothp)  
xtabs(~r\_govmr+r\_govmd+r\_hiothp,data)

## , , r\_hiothp = .d  
##   
## r\_govmd  
## r\_govmr .d .m .r 0.no 1.yes  
## .d 0 0 0 0 1  
## .m 0 0 0 0 0  
## .r 0 0 0 0 1  
## 0.no 1 0 0 28 0  
## 1.yes 1 0 0 28 7  
##   
## , , r\_hiothp = .m  
##   
## r\_govmd  
## r\_govmr .d .m .r 0.no 1.yes  
## .d 0 0 0 0 0  
## .m 0 18 0 0 0  
## .r 0 0 0 0 0  
## 0.no 0 0 0 0 0  
## 1.yes 0 0 0 0 0  
##   
## , , r\_hiothp = .r  
##   
## r\_govmd  
## r\_govmr .d .m .r 0.no 1.yes  
## .d 0 0 0 0 0  
## .m 0 0 0 0 0  
## .r 0 0 12 0 0  
## 0.no 0 0 0 17 0  
## 1.yes 0 0 0 4 1  
##   
## , , r\_hiothp = 0.no  
##   
## r\_govmd  
## r\_govmr .d .m .r 0.no 1.yes  
## .d 5 0 0 24 6  
## .m 0 0 0 0 0  
## .r 0 0 2 0 0  
## 0.no 5 0 0 10139 421  
## 1.yes 19 0 1 4010 551  
##   
## , , r\_hiothp = 1.yes  
##   
## r\_govmd  
## r\_govmr .d .m .r 0.no 1.yes  
## .d 1 0 0 3 0  
## .m 0 0 0 0 0  
## .r 0 0 0 0 0  
## 0.no 1 0 0 813 14  
## 1.yes 3 0 0 918 17

Generate r\_insurance heath insurance variable - 0: without Medicare or Medicaid or other insurnace (n=10695) - 1: only with Medicare or Medicaid; (n=4343+576+441) - 2: Only with other insurance; (n=882) - 3: With Medicare or Medicaid and with other insurance“(n=990+19+14)

-out-of-pocket medical expendituresr\_oopmd

#   
r\_insurance<-ifelse(data$r\_govmr=="0.no" & data$r\_govmd=="0.no" & data$r\_hiothp=="0.no",0,  
 ifelse((data$r\_govmr=="1.yes" | data$r\_govmd=="1.yes") & data$r\_hiothp=="0.no",1,   
 ifelse(data$r\_govmr=="0.no" & data$r\_govmd=="0.no" & data$r\_hiothp=="1.yes",2,  
 ifelse((data$r\_govmr=="1.yes" | data$r\_govmd=="1.yes")& data$r\_hiothp=="1.yes",3,NA))))   
  
r\_insurance<-as.factor(r\_insurance)  
  
r\_insurance<-factor(r\_insurance, levels = c(0,1,2,3), labels = c("Without Medicare or Medicaid or other insurnace", "Only with Medicare or Medicaid","Only with other insurance","With Medicare or Medicaid and with other insurance"))  
summary(r\_insurance)

## Without Medicare or Medicaid or other insurnace   
## 10139   
## Only with Medicare or Medicaid   
## 5008   
## Only with other insurance   
## 813   
## With Medicare or Medicaid and with other insurance   
## 952   
## NA's   
## 160

r\_insurance<-relevel(r\_insurance,ref="Without Medicare or Medicaid or other insurnace")  
  
# our of pocket medical expenditure  
r\_oopmd<-as.numeric(data$r\_oopmd)  
t.test(r\_oopmd~r\_retire)

##   
## Welch Two Sample t-test  
##   
## data: r\_oopmd by r\_retire  
## t = -4.0117, df = 8425.3, p-value = 6.08e-05  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -685.4023 -235.4466  
## sample estimates:  
## mean in group 0 mean in group 1   
## 2978.075 3438.500

Independent variables: – years of education (raeduc) – total household income (h\_itot) – Number of chronic disease(num\_chronic) – ADLA and IADLA (r\_adla,r\_iadla) – DELAYED WORD RECALL (r\_dlrc) – whether you retire or notr\_retire

#Education levels  
raeduc<-as.factor(data$raeduc)  
summary(aov(r\_cesd ~ raeduc))

## Df Sum Sq Mean Sq F value Pr(>F)   
## raeduc 5 3731 746.2 206.2 <2e-16 \*\*\*  
## Residuals 16376 59271 3.6   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
## 690 observations deleted due to missingness

# Total household income  
h\_itot<-as.numeric(data$h\_itot)  
cor.test(r\_cesd,h\_itot)

##   
## Pearson's product-moment correlation  
##   
## data: r\_cesd and h\_itot  
## t = -21.608, df = 16380, p-value < 2.2e-16  
## alternative hypothesis: true correlation is not equal to 0  
## 95 percent confidence interval:  
## -0.1813277 -0.1515496  
## sample estimates:  
## cor   
## -0.1664766

# Measurement of quality of life  
r\_adla<-as.numeric(data$r\_adla)  
cor.test(r\_cesd,r\_adla)

##   
## Pearson's product-moment correlation  
##   
## data: r\_cesd and r\_adla  
## t = 49.554, df = 16379, p-value < 2.2e-16  
## alternative hypothesis: true correlation is not equal to 0  
## 95 percent confidence interval:  
## 0.3476880 0.3743233  
## sample estimates:  
## cor   
## 0.3610793

r\_iadla<-as.numeric(data$r\_iadla)  
cor.test(r\_cesd,r\_iadla)

##   
## Pearson's product-moment correlation  
##   
## data: r\_cesd and r\_iadla  
## t = 38.068, df = 16378, p-value < 2.2e-16  
## alternative hypothesis: true correlation is not equal to 0  
## 95 percent confidence interval:  
## 0.2709796 0.2991190  
## sample estimates:  
## cor   
## 0.2851107

Medical care utilization – hospital stays (r\_hosp) –difficulty to walk across room (r\_walkr) – marital status(r\_mstat) - Medical care utilization: Home Care(r\_homcar) - # Nurs home stays, prv 2 yrs(r\_nrstim) - # Doctor vists, prv 2 yrs(r\_doctim)

#hospital stays   
data$r\_hosp<-as.factor(data$r\_hosp)  
data$r\_hosp[data$r\_hosp==".r"|data$r\_hosp==".d"|data$r\_hosp==".m"]<-NA  
  
r\_hosp<-relevel(data$r\_hosp,ref="0.no")  
  
t.test(r\_cesd~r\_hosp)

##   
## Welch Two Sample t-test  
##   
## data: r\_cesd by r\_hosp  
## t = -17.851, df = 4427.1, p-value < 2.2e-16  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -0.8530374 -0.6842069  
## sample estimates:  
## mean in group 0.no mean in group 1.yes   
## 1.168802 1.937424

#difficulty to walk across room  
data$r\_walkr<-ifelse(data$r\_walkr=="0.no","0.no",  
 ifelse(data$r\_walkr=="1.yes","1.yes",  
 ifelse(data$r\_walkr=="2.can't do","2.can't do",  
 ifelse(data$r\_walkr=="9.don't do","9.don't do",NA))))  
data$r\_walkr<-as.factor(data$r\_walkr)  
r\_walkr<-relevel(data$r\_walkr,ref="0.no")  
summary(aov(r\_cesd ~ r\_walkr))

## Df Sum Sq Mean Sq F value Pr(>F)   
## r\_walkr 3 4337 1445.6 403.8 <2e-16 \*\*\*  
## Residuals 16374 58611 3.6   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
## 694 observations deleted due to missingness

Financial stability - Income:R Pension + Annuity (r\_ipena) - Whether family income is HwINPOV HwINPOVA below the poverty thresholdh\_inpov

# Income:R Pension + Annuity (`r\_ipena`)  
r\_ipena<-as.numeric(data$r\_ipena)  
cor.test(r\_cesd,r\_ipena)

##   
## Pearson's product-moment correlation  
##   
## data: r\_cesd and r\_ipena  
## t = -10.246, df = 16380, p-value < 2.2e-16  
## alternative hypothesis: true correlation is not equal to 0  
## 95 percent confidence interval:  
## -0.09499670 -0.06456497  
## sample estimates:  
## cor   
## -0.07979943

# Whether family income is HwINPOV HwINPOVA below the poverty threshold`h\_inpov`   
data$h\_inpov<-ifelse(data$h\_inpov=="0.hh inc above pov thresh",0,  
 ifelse(data$h\_inpov=="1.hh inc below pov thresh",1,NA))  
data$h\_inpov<-factor(data$h\_inpov, levels = c(0,1), labels = c("HH income above poverty threshold","HH income below poverty threshold"))  
h\_inpov<-relevel(data$h\_inpov,ref="HH income above poverty threshold")  
t.test(r\_cesd~h\_inpov)

##   
## Welch Two Sample t-test  
##   
## data: r\_cesd by h\_inpov  
## t = -18.828, df = 1542.3, p-value < 2.2e-16  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -1.458934 -1.183630  
## sample estimates:  
## mean in group HH income above poverty threshold   
## 1.213999   
## mean in group HH income below poverty threshold   
## 2.535282

# Demographic statistics

# interaction between age and retire,nope  
model<-lmer(r\_cesd~ age\*factor(r\_retire)+factor(gender)+factor(race)+factor(raeduc)+r\_hosp+r\_insurance+r\_nrstim+r\_walkr+r\_doctim+r\_ipena+h\_inpov+r\_oopmd+r\_adla+r\_iadla+(1|ï..hhidpn)+(1|year),data=data, REML=FALSE)

## Warning: Some predictor variables are on very different scales: consider  
## rescaling

summary(model)

## Linear mixed model fit by maximum likelihood ['lmerMod']  
## Formula:   
## r\_cesd ~ age \* factor(r\_retire) + factor(gender) + factor(race) +   
## factor(raeduc) + r\_hosp + r\_insurance + r\_nrstim + r\_walkr +   
## r\_doctim + r\_ipena + h\_inpov + r\_oopmd + r\_adla + r\_iadla +   
## (1 | ï..hhidpn) + (1 | year)  
## Data: data  
##   
## AIC BIC logLik deviance df.resid   
## 57757.7 57979.7 -28849.9 57699.7 15554   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -5.1277 -0.4164 -0.1610 0.2743 4.9740   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## ï..hhidpn (Intercept) 1.487876 1.219785  
## year (Intercept) 0.000034 0.005831  
## Residual 1.534656 1.238812  
## Number of obs: 15583, groups: ï..hhidpn, 5077; year, 4  
##   
## Fixed effects:  
## Estimate  
## (Intercept) 3.673e+00  
## age -3.739e-02  
## factor(r\_retire)1 9.121e-01  
## factor(gender)2.female 2.037e-01  
## factor(race)Black/African American 6.176e-02  
## factor(race)Other 2.474e-01  
## factor(raeduc)1.lt high-school 4.337e-02  
## factor(raeduc)2.ged -2.804e-02  
## factor(raeduc)3.high-school graduate -5.208e-01  
## factor(raeduc)4.some college -6.432e-01  
## factor(raeduc)5.college and above -9.501e-01  
## r\_hosp1.yes 1.454e-01  
## r\_insuranceOnly with Medicare or Medicaid 2.419e-01  
## r\_insuranceOnly with other insurance 3.392e-02  
## r\_insuranceWith Medicare or Medicaid and with other insurance 2.037e-01  
## r\_nrstim -6.276e-02  
## r\_walkr1.yes 1.509e-01  
## r\_walkr2.can't do -7.125e-01  
## r\_walkr9.don't do -2.014e-01  
## r\_doctim 4.040e-03  
## r\_ipena -2.298e-06  
## h\_inpovHH income below poverty threshold 2.796e-01  
## r\_oopmd 1.094e-05  
## r\_adla 5.081e-01  
## r\_iadla 5.418e-01  
## age:factor(r\_retire)1 -1.308e-02  
## Std. Error  
## (Intercept) 1.043e+00  
## age 4.576e-03  
## factor(r\_retire)1 4.485e-01  
## factor(gender)2.female 4.157e-02  
## factor(race)Black/African American 5.975e-02  
## factor(race)Other 7.611e-02  
## factor(raeduc)1.lt high-school 1.002e+00  
## factor(raeduc)2.ged 1.005e+00  
## factor(raeduc)3.high-school graduate 1.001e+00  
## factor(raeduc)4.some college 1.001e+00  
## factor(raeduc)5.college and above 1.001e+00  
## r\_hosp1.yes 3.277e-02  
## r\_insuranceOnly with Medicare or Medicaid 3.973e-02  
## r\_insuranceOnly with other insurance 6.143e-02  
## r\_insuranceWith Medicare or Medicaid and with other insurance 6.575e-02  
## r\_nrstim 2.753e-02  
## r\_walkr1.yes 9.218e-02  
## r\_walkr2.can't do 4.456e-01  
## r\_walkr9.don't do 6.629e-01  
## r\_doctim 6.650e-04  
## r\_ipena 1.045e-06  
## h\_inpovHH income below poverty threshold 5.001e-02  
## r\_oopmd 2.061e-06  
## r\_adla 2.893e-02  
## r\_iadla 4.360e-02  
## age:factor(r\_retire)1 7.101e-03  
## t value  
## (Intercept) 3.523  
## age -8.170  
## factor(r\_retire)1 2.033  
## factor(gender)2.female 4.900  
## factor(race)Black/African American 1.034  
## factor(race)Other 3.251  
## factor(raeduc)1.lt high-school 0.043  
## factor(raeduc)2.ged -0.028  
## factor(raeduc)3.high-school graduate -0.520  
## factor(raeduc)4.some college -0.642  
## factor(raeduc)5.college and above -0.949  
## r\_hosp1.yes 4.439  
## r\_insuranceOnly with Medicare or Medicaid 6.088  
## r\_insuranceOnly with other insurance 0.552  
## r\_insuranceWith Medicare or Medicaid and with other insurance 3.098  
## r\_nrstim -2.280  
## r\_walkr1.yes 1.637  
## r\_walkr2.can't do -1.599  
## r\_walkr9.don't do -0.304  
## r\_doctim 6.075  
## r\_ipena -2.199  
## h\_inpovHH income below poverty threshold 5.590  
## r\_oopmd 5.309  
## r\_adla 17.564  
## r\_iadla 12.427  
## age:factor(r\_retire)1 -1.842

##   
## Correlation matrix not shown by default, as p = 26 > 12.  
## Use print(x, correlation=TRUE) or  
## vcov(x) if you need it

## fit warnings:  
## Some predictor variables are on very different scales: consider rescaling

stargazer(model, title="Model Comparison",  
 type="text",align=TRUE,single.row=TRUE)

##   
## Model Comparison  
## =========================================================================================  
## Dependent variable:   
## ---------------------------  
## r\_cesd   
## -----------------------------------------------------------------------------------------  
## age -0.037\*\*\* (0.005)   
## factor(r\_retire)1 0.912\*\* (0.449)   
## factor(gender)2.female 0.204\*\*\* (0.042)   
## factor(race)Black/African American 0.062 (0.060)   
## factor(race)Other 0.247\*\*\* (0.076)   
## factor(raeduc)1.lt high-school 0.043 (1.002)   
## factor(raeduc)2.ged -0.028 (1.005)   
## factor(raeduc)3.high-school graduate -0.521 (1.001)   
## factor(raeduc)4.some college -0.643 (1.001)   
## factor(raeduc)5.college and above -0.950 (1.001)   
## r\_hosp1.yes 0.145\*\*\* (0.033)   
## r\_insuranceOnly with Medicare or Medicaid 0.242\*\*\* (0.040)   
## r\_insuranceOnly with other insurance 0.034 (0.061)   
## r\_insuranceWith Medicare or Medicaid and with other insurance 0.204\*\*\* (0.066)   
## r\_nrstim -0.063\*\* (0.028)   
## r\_walkr1.yes 0.151 (0.092)   
## r\_walkr2.can't do -0.712 (0.446)   
## r\_walkr9.don't do -0.201 (0.663)   
## r\_doctim 0.004\*\*\* (0.001)   
## r\_ipena -0.00000\*\* (0.00000)   
## h\_inpovHH income below poverty threshold 0.280\*\*\* (0.050)   
## r\_oopmd 0.00001\*\*\* (0.00000)   
## r\_adla 0.508\*\*\* (0.029)   
## r\_iadla 0.542\*\*\* (0.044)   
## age:factor(r\_retire)1 -0.013\* (0.007)   
## Constant 3.673\*\*\* (1.043)   
## -----------------------------------------------------------------------------------------  
## Observations 15,583   
## Log Likelihood -28,849.870   
## Akaike Inf. Crit. 57,757.750   
## Bayesian Inf. Crit. 57,979.710   
## =========================================================================================  
## Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

model3<-lmer(r\_cesd~ (age+factor(r\_insurance)+factor(gender)+factor(race)+factor(raeduc)+r\_hosp+r\_nrstim+r\_walkr+r\_doctim+r\_ipena+h\_inpov+r\_oopmd+r\_adla+r\_iadla+num\_chronic+data$r\_dlrc) \*factor(r\_retire)+(1|ï..hhidpn)+(1|year),data=data, REML=FALSE)

## Warning: Some predictor variables are on very different scales: consider  
## rescaling

stargazer(model3, title="Model Comparison",  
 type="text",align=TRUE,single.row=TRUE)

##   
## Model Comparison  
## ===================================================================================================================  
## Dependent variable:   
## ---------------------------  
## r\_cesd   
## -------------------------------------------------------------------------------------------------------------------  
## age -0.048\*\*\* (0.006)   
## factor(r\_insurance)Only with Medicare or Medicaid 0.160\*\* (0.063)   
## factor(r\_insurance)Only with other insurance 0.014 (0.081)   
## factor(r\_insurance)With Medicare or Medicaid and with other insurance -0.035 (0.131)   
## factor(gender)2.female 0.258\*\*\* (0.048)   
## factor(race)Black/African American 0.005 (0.070)   
## factor(race)Other 0.217\*\* (0.086)   
## factor(raeduc)1.lt high-school -0.164 (1.125)   
## factor(raeduc)2.ged -0.226 (1.129)   
## factor(raeduc)3.high-school graduate -0.711 (1.124)   
## factor(raeduc)4.some college -0.811 (1.124)   
## factor(raeduc)5.college and above -0.960 (1.124)   
## r\_hosp1.yes 0.139\*\*\* (0.049)   
## r\_nrstim -0.078\*\*\* (0.029)   
## r\_walkr1.yes 0.038 (0.152)   
## r\_walkr2.can't do -1.932\*\* (0.956)   
## r\_walkr9.don't do 0.932 (0.955)   
## r\_doctim 0.002\*\* (0.001)   
## r\_ipena -0.00000 (0.00000)   
## h\_inpovHH income below poverty threshold 0.342\*\*\* (0.072)   
## r\_oopmd 0.00001\*\* (0.00000)   
## r\_adla 0.593\*\*\* (0.048)   
## r\_iadla 0.584\*\*\* (0.068)   
## num\_chronic 0.176\*\*\* (0.020)   
## r\_dlrc -0.056\*\*\* (0.010)   
## factor(r\_retire)1 1.133 (1.530)   
## age:factor(r\_retire)1 -0.028\*\*\* (0.010)   
## factor(r\_insurance)Only with Medicare or Medicaid:factor(r\_retire)1 0.194\*\* (0.095)   
## factor(r\_insurance)Only with other insurance:factor(r\_retire)1 0.085 (0.167)   
## factor(r\_insurance)With Medicare or Medicaid and with other insurance:factor(r\_retire)1 0.303\* (0.172)   
## factor(gender)2.female:factor(r\_retire)1 -0.069 (0.080)   
## factor(race)Black/African American:factor(r\_retire)1 -0.095 (0.111)   
## factor(race)Other:factor(r\_retire)1 -0.164 (0.152)   
## factor(raeduc)1.lt high-school:factor(r\_retire)1 0.387 (1.381)   
## factor(raeduc)2.ged:factor(r\_retire)1 0.483 (1.386)   
## factor(raeduc)3.high-school graduate:factor(r\_retire)1 0.411 (1.379)   
## factor(raeduc)4.some college:factor(r\_retire)1 0.494 (1.379)   
## factor(raeduc)5.college and above:factor(r\_retire)1 0.225 (1.379)   
## r\_hosp1.yes:factor(r\_retire)1 -0.103 (0.082)   
## r\_nrstim:factor(r\_retire)1 0.246 (0.171)   
## r\_walkr1.yes:factor(r\_retire)1 0.025 (0.209)   
## r\_walkr2.can't do:factor(r\_retire)1 -0.054 (1.244)   
## r\_walkr9.don't do:factor(r\_retire)1 -3.056\*\* (1.462)   
## r\_doctim:factor(r\_retire)1 0.003\* (0.002)   
## r\_ipena:factor(r\_retire)1 -0.00000 (0.00000)   
## h\_inpovHH income below poverty threshold:factor(r\_retire)1 -0.126 (0.117)   
## r\_oopmd:factor(r\_retire)1 0.00001 (0.00000)   
## r\_adla:factor(r\_retire)1 -0.169\*\*\* (0.064)   
## r\_iadla:factor(r\_retire)1 -0.115 (0.095)   
## num\_chronic:factor(r\_retire)1 0.053\* (0.030)   
## r\_dlrc:factor(r\_retire)1 0.036\* (0.019)   
## Constant 4.450\*\*\* (1.180)   
## -------------------------------------------------------------------------------------------------------------------  
## Observations 11,868   
## Log Likelihood -22,315.150   
## Akaike Inf. Crit. 44,740.290   
## Bayesian Inf. Crit. 45,146.280   
## ===================================================================================================================  
## Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

model4<-lmer(r\_cesd~ factor(gender)+(age+factor(r\_insurance)+factor(race)+factor(raeduc)+h\_itot+r\_hosp+r\_nrstim+r\_walkr+r\_doctim+r\_ipena+h\_inpov+r\_oopmd+r\_adla+r\_iadla+num\_chronic+data$r\_dlrc) \*factor(r\_retire)+(1|ï..hhidpn)+(1|year),data=data, REML=FALSE)

## Warning: Some predictor variables are on very different scales: consider  
## rescaling

summary(model4)

## Linear mixed model fit by maximum likelihood ['lmerMod']  
## Formula:   
## r\_cesd ~ factor(gender) + (age + factor(r\_insurance) + factor(race) +   
## factor(raeduc) + h\_itot + r\_hosp + r\_nrstim + r\_walkr + r\_doctim +   
## r\_ipena + h\_inpov + r\_oopmd + r\_adla + r\_iadla + num\_chronic +   
## data$r\_dlrc) \* factor(r\_retire) + (1 | ï..hhidpn) + (1 | year)  
## Data: data  
##   
## AIC BIC logLik deviance df.resid   
## 44717.4 45130.7 -22302.7 44605.4 11812   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -4.2512 -0.4212 -0.1729 0.2696 4.6190   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## ï..hhidpn (Intercept) 1.379 1.174   
## year (Intercept) 0.000 0.000   
## Residual 1.585 1.259   
## Number of obs: 11868, groups: ï..hhidpn, 4973; year, 3  
##   
## Fixed effects:  
## Estimate  
## (Intercept) 4.507e+00  
## factor(gender)2.female 2.355e-01  
## age -4.805e-02  
## factor(r\_insurance)Only with Medicare or Medicaid 1.517e-01  
## factor(r\_insurance)Only with other insurance 1.122e-02  
## factor(r\_insurance)With Medicare or Medicaid and with other insurance -5.366e-02  
## factor(race)Black/African American -1.530e-02  
## factor(race)Other 1.989e-01  
## factor(raeduc)1.lt high-school -1.498e-01  
## factor(raeduc)2.ged -2.053e-01  
## factor(raeduc)3.high-school graduate -6.844e-01  
## factor(raeduc)4.some college -7.681e-01  
## factor(raeduc)5.college and above -8.770e-01  
## h\_itot -8.410e-07  
## r\_hosp1.yes 1.387e-01  
## r\_nrstim -7.780e-02  
## r\_walkr1.yes 3.554e-02  
## r\_walkr2.can't do -1.946e+00  
## r\_walkr9.don't do 9.330e-01  
## r\_doctim 1.783e-03  
## r\_ipena -4.398e-07  
## h\_inpovHH income below poverty threshold 3.048e-01  
## r\_oopmd 7.338e-06  
## r\_adla 5.925e-01  
## r\_iadla 5.795e-01  
## num\_chronic 1.725e-01  
## data$r\_dlrc -5.373e-02  
## factor(r\_retire)1 1.092e+00  
## age:factor(r\_retire)1 -2.818e-02  
## factor(r\_insurance)Only with Medicare or Medicaid:factor(r\_retire)1 2.011e-01  
## factor(r\_insurance)Only with other insurance:factor(r\_retire)1 9.774e-02  
## factor(r\_insurance)With Medicare or Medicaid and with other insurance:factor(r\_retire)1 3.190e-01  
## factor(race)Black/African American:factor(r\_retire)1 -9.336e-02  
## factor(race)Other:factor(r\_retire)1 -1.487e-01  
## factor(raeduc)1.lt high-school:factor(r\_retire)1 3.979e-01  
## factor(raeduc)2.ged:factor(r\_retire)1 4.951e-01  
## factor(raeduc)3.high-school graduate:factor(r\_retire)1 4.180e-01  
## factor(raeduc)4.some college:factor(r\_retire)1 4.940e-01  
## factor(raeduc)5.college and above:factor(r\_retire)1 2.078e-01  
## h\_itot:factor(r\_retire)1 2.053e-07  
## r\_hosp1.yes:factor(r\_retire)1 -1.003e-01  
## r\_nrstim:factor(r\_retire)1 2.438e-01  
## r\_walkr1.yes:factor(r\_retire)1 2.710e-02  
## r\_walkr2.can't do:factor(r\_retire)1 -2.676e-02  
## r\_walkr9.don't do:factor(r\_retire)1 -3.082e+00  
## r\_doctim:factor(r\_retire)1 2.885e-03  
## r\_ipena:factor(r\_retire)1 -2.165e-06  
## h\_inpovHH income below poverty threshold:factor(r\_retire)1 -1.101e-01  
## r\_oopmd:factor(r\_retire)1 6.202e-06  
## r\_adla:factor(r\_retire)1 -1.692e-01  
## r\_iadla:factor(r\_retire)1 -1.126e-01  
## num\_chronic:factor(r\_retire)1 5.648e-02  
## data$r\_dlrc:factor(r\_retire)1 3.332e-02  
## Std. Error  
## (Intercept) 1.177e+00  
## factor(gender)2.female 4.308e-02  
## age 5.705e-03  
## factor(r\_insurance)Only with Medicare or Medicaid 6.283e-02  
## factor(r\_insurance)Only with other insurance 8.059e-02  
## factor(r\_insurance)With Medicare or Medicaid and with other insurance 1.309e-01  
## factor(race)Black/African American 6.993e-02  
## factor(race)Other 8.577e-02  
## factor(raeduc)1.lt high-school 1.123e+00  
## factor(raeduc)2.ged 1.126e+00  
## factor(raeduc)3.high-school graduate 1.121e+00  
## factor(raeduc)4.some college 1.121e+00  
## factor(raeduc)5.college and above 1.121e+00  
## h\_itot 1.742e-07  
## r\_hosp1.yes 4.867e-02  
## r\_nrstim 2.878e-02  
## r\_walkr1.yes 1.517e-01  
## r\_walkr2.can't do 9.552e-01  
## r\_walkr9.don't do 9.541e-01  
## r\_doctim 8.435e-04  
## r\_ipena 1.614e-06  
## h\_inpovHH income below poverty threshold 7.253e-02  
## r\_oopmd 3.191e-06  
## r\_adla 4.803e-02  
## r\_iadla 6.808e-02  
## num\_chronic 1.983e-02  
## data$r\_dlrc 1.020e-02  
## factor(r\_retire)1 1.529e+00  
## age:factor(r\_retire)1 1.044e-02  
## factor(r\_insurance)Only with Medicare or Medicaid:factor(r\_retire)1 9.495e-02  
## factor(r\_insurance)Only with other insurance:factor(r\_retire)1 1.670e-01  
## factor(r\_insurance)With Medicare or Medicaid and with other insurance:factor(r\_retire)1 1.718e-01  
## factor(race)Black/African American:factor(r\_retire)1 1.106e-01  
## factor(race)Other:factor(r\_retire)1 1.517e-01  
## factor(raeduc)1.lt high-school:factor(r\_retire)1 1.381e+00  
## factor(raeduc)2.ged:factor(r\_retire)1 1.386e+00  
## factor(raeduc)3.high-school graduate:factor(r\_retire)1 1.378e+00  
## factor(raeduc)4.some college:factor(r\_retire)1 1.378e+00  
## factor(raeduc)5.college and above:factor(r\_retire)1 1.379e+00  
## h\_itot:factor(r\_retire)1 3.912e-07  
## r\_hosp1.yes:factor(r\_retire)1 8.153e-02  
## r\_nrstim:factor(r\_retire)1 1.704e-01  
## r\_walkr1.yes:factor(r\_retire)1 2.090e-01  
## r\_walkr2.can't do:factor(r\_retire)1 1.242e+00  
## r\_walkr9.don't do:factor(r\_retire)1 1.460e+00  
## r\_doctim:factor(r\_retire)1 1.686e-03  
## r\_ipena:factor(r\_retire)1 2.478e-06  
## h\_inpovHH income below poverty threshold:factor(r\_retire)1 1.176e-01  
## r\_oopmd:factor(r\_retire)1 4.867e-06  
## r\_adla:factor(r\_retire)1 6.412e-02  
## r\_iadla:factor(r\_retire)1 9.523e-02  
## num\_chronic:factor(r\_retire)1 3.042e-02  
## data$r\_dlrc:factor(r\_retire)1 1.914e-02  
## t value  
## (Intercept) 3.829  
## factor(gender)2.female 5.467  
## age -8.423  
## factor(r\_insurance)Only with Medicare or Medicaid 2.414  
## factor(r\_insurance)Only with other insurance 0.139  
## factor(r\_insurance)With Medicare or Medicaid and with other insurance -0.410  
## factor(race)Black/African American -0.219  
## factor(race)Other 2.319  
## factor(raeduc)1.lt high-school -0.133  
## factor(raeduc)2.ged -0.182  
## factor(raeduc)3.high-school graduate -0.610  
## factor(raeduc)4.some college -0.685  
## factor(raeduc)5.college and above -0.782  
## h\_itot -4.829  
## r\_hosp1.yes 2.850  
## r\_nrstim -2.704  
## r\_walkr1.yes 0.234  
## r\_walkr2.can't do -2.037  
## r\_walkr9.don't do 0.978  
## r\_doctim 2.113  
## r\_ipena -0.273  
## h\_inpovHH income below poverty threshold 4.202  
## r\_oopmd 2.299  
## r\_adla 12.336  
## r\_iadla 8.512  
## num\_chronic 8.702  
## data$r\_dlrc -5.268  
## factor(r\_retire)1 0.715  
## age:factor(r\_retire)1 -2.700  
## factor(r\_insurance)Only with Medicare or Medicaid:factor(r\_retire)1 2.118  
## factor(r\_insurance)Only with other insurance:factor(r\_retire)1 0.585  
## factor(r\_insurance)With Medicare or Medicaid and with other insurance:factor(r\_retire)1 1.856  
## factor(race)Black/African American:factor(r\_retire)1 -0.844  
## factor(race)Other:factor(r\_retire)1 -0.980  
## factor(raeduc)1.lt high-school:factor(r\_retire)1 0.288  
## factor(raeduc)2.ged:factor(r\_retire)1 0.357  
## factor(raeduc)3.high-school graduate:factor(r\_retire)1 0.303  
## factor(raeduc)4.some college:factor(r\_retire)1 0.358  
## factor(raeduc)5.college and above:factor(r\_retire)1 0.151  
## h\_itot:factor(r\_retire)1 0.525  
## r\_hosp1.yes:factor(r\_retire)1 -1.231  
## r\_nrstim:factor(r\_retire)1 1.431  
## r\_walkr1.yes:factor(r\_retire)1 0.130  
## r\_walkr2.can't do:factor(r\_retire)1 -0.022  
## r\_walkr9.don't do:factor(r\_retire)1 -2.110  
## r\_doctim:factor(r\_retire)1 1.711  
## r\_ipena:factor(r\_retire)1 -0.874  
## h\_inpovHH income below poverty threshold:factor(r\_retire)1 -0.936  
## r\_oopmd:factor(r\_retire)1 1.274  
## r\_adla:factor(r\_retire)1 -2.638  
## r\_iadla:factor(r\_retire)1 -1.182  
## num\_chronic:factor(r\_retire)1 1.857  
## data$r\_dlrc:factor(r\_retire)1 1.741

##   
## Correlation matrix not shown by default, as p = 53 > 12.  
## Use print(x, correlation=TRUE) or  
## vcov(x) if you need it

## fit warnings:  
## Some predictor variables are on very different scales: consider rescaling

stargazer(model4, title="Model Comparison",  
 type="text",align=TRUE,single.row=TRUE)

##   
## Model Comparison  
## ===================================================================================================================  
## Dependent variable:   
## ---------------------------  
## r\_cesd   
## -------------------------------------------------------------------------------------------------------------------  
## factor(gender)2.female 0.236\*\*\* (0.043)   
## age -0.048\*\*\* (0.006)   
## factor(r\_insurance)Only with Medicare or Medicaid 0.152\*\* (0.063)   
## factor(r\_insurance)Only with other insurance 0.011 (0.081)   
## factor(r\_insurance)With Medicare or Medicaid and with other insurance -0.054 (0.131)   
## factor(race)Black/African American -0.015 (0.070)   
## factor(race)Other 0.199\*\* (0.086)   
## factor(raeduc)1.lt high-school -0.150 (1.123)   
## factor(raeduc)2.ged -0.205 (1.126)   
## factor(raeduc)3.high-school graduate -0.684 (1.121)   
## factor(raeduc)4.some college -0.768 (1.121)   
## factor(raeduc)5.college and above -0.877 (1.121)   
## h\_itot -0.00000\*\*\* (0.00000)   
## r\_hosp1.yes 0.139\*\*\* (0.049)   
## r\_nrstim -0.078\*\*\* (0.029)   
## r\_walkr1.yes 0.036 (0.152)   
## r\_walkr2.can't do -1.946\*\* (0.955)   
## r\_walkr9.don't do 0.933 (0.954)   
## r\_doctim 0.002\*\* (0.001)   
## r\_ipena -0.00000 (0.00000)   
## h\_inpovHH income below poverty threshold 0.305\*\*\* (0.073)   
## r\_oopmd 0.00001\*\* (0.00000)   
## r\_adla 0.592\*\*\* (0.048)   
## r\_iadla 0.580\*\*\* (0.068)   
## num\_chronic 0.173\*\*\* (0.020)   
## r\_dlrc -0.054\*\*\* (0.010)   
## factor(r\_retire)1 1.092 (1.529)   
## age:factor(r\_retire)1 -0.028\*\*\* (0.010)   
## factor(r\_insurance)Only with Medicare or Medicaid:factor(r\_retire)1 0.201\*\* (0.095)   
## factor(r\_insurance)Only with other insurance:factor(r\_retire)1 0.098 (0.167)   
## factor(r\_insurance)With Medicare or Medicaid and with other insurance:factor(r\_retire)1 0.319\* (0.172)   
## factor(race)Black/African American:factor(r\_retire)1 -0.093 (0.111)   
## factor(race)Other:factor(r\_retire)1 -0.149 (0.152)   
## factor(raeduc)1.lt high-school:factor(r\_retire)1 0.398 (1.381)   
## factor(raeduc)2.ged:factor(r\_retire)1 0.495 (1.386)   
## factor(raeduc)3.high-school graduate:factor(r\_retire)1 0.418 (1.378)   
## factor(raeduc)4.some college:factor(r\_retire)1 0.494 (1.378)   
## factor(raeduc)5.college and above:factor(r\_retire)1 0.208 (1.379)   
## h\_itot:factor(r\_retire)1 0.00000 (0.00000)   
## r\_hosp1.yes:factor(r\_retire)1 -0.100 (0.082)   
## r\_nrstim:factor(r\_retire)1 0.244 (0.170)   
## r\_walkr1.yes:factor(r\_retire)1 0.027 (0.209)   
## r\_walkr2.can't do:factor(r\_retire)1 -0.027 (1.242)   
## r\_walkr9.don't do:factor(r\_retire)1 -3.082\*\* (1.460)   
## r\_doctim:factor(r\_retire)1 0.003\* (0.002)   
## r\_ipena:factor(r\_retire)1 -0.00000 (0.00000)   
## h\_inpovHH income below poverty threshold:factor(r\_retire)1 -0.110 (0.118)   
## r\_oopmd:factor(r\_retire)1 0.00001 (0.00000)   
## r\_adla:factor(r\_retire)1 -0.169\*\*\* (0.064)   
## r\_iadla:factor(r\_retire)1 -0.113 (0.095)   
## num\_chronic:factor(r\_retire)1 0.056\* (0.030)   
## r\_dlrc:factor(r\_retire)1 0.033\* (0.019)   
## Constant 4.507\*\*\* (1.177)   
## -------------------------------------------------------------------------------------------------------------------  
## Observations 11,868   
## Log Likelihood -22,302.690   
## Akaike Inf. Crit. 44,717.380   
## Bayesian Inf. Crit. 45,130.750   
## ===================================================================================================================  
## Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

#print(summary(model4)$coefficients[c("r\_walkr"," r\_dlrc"),c(1,2)],digits=2)