# One Medical

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# Import dependencies/packages

# Import datasets

```
mbr <- read_csv("spacex_members.csv")
clm <- read_csv("spacex_claims.csv")
rx <- read_csv("spacex_pharmacy.csv")
ctr <- read_csv("SpaceX Health Center Claims 1016 to 1217.csv")
feesch <- read_csv("Blueshield LA allowed fee schedule.csv")
```

# Custom functions

```
getmode <- function(v) {
    force(v)
    uniqv <- unique(v)
    uniqv[which.max(tabulate(match(v, uniqv)))]
}
```

# Format claims to combine CH claims to OM Center claims

```
clm_dol = clm
clm_dol$`Metaclaims Analytics Medical Allowed Amount` = as.numeric(gsub("[\\$,]", "", cl
m_dol$`Metaclaims Analytics Medical Allowed Amount`))
clm_dol$`Metaclaims Analytics Medical First Name` = str_to_title(clm_dol$`Metaclaims Ana
lytics Medical First Name`)
clm_dol$`Metaclaims Analytics Medical Last Name` = str_to_title(clm_dol$`Metaclaims Anal
ytics Medical Last Name`)

clm_sub = clm_dol %>%
  mutate(personid = (`Metaclaims Analytics Medical Person ID`),
         female = (`Metaclaims Analytics Medical Gender`=="F"),
         firstname = `Metaclaims Analytics Medical First Name`,
         lastname = `Metaclaims Analytics Medical Last Name`,
         pos = `Metaclaims Analytics Medical Service Category Detail`,
         dos = `Metaclaims Analytics Medical Service Date Start Date`,
         om_flag = ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="460695495")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1467701821))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="460741732")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1073862256))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="362169147")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1336709112))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="814542216")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1518438712))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="383906267")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1528538774))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="471708588")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1184014854))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="271346767")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1467781641))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="911942315")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1073553947))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="812141065")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1467800383))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="452282261")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1962798645))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="273009385")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1861709487))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="812980907")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1598214397))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="270243800")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1144457151))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="020619758")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1497786883))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="461773122")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1508103169))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="800925565")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1417382102))|
                  ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="800925565")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1922470392)),
         em_flag = ((`Metaclaims Analytics Medical Procedure Code`=='99201')|
                    (`Metaclaims Analytics Medical Procedure Code`=='99202')|
                    (`Metaclaims Analytics Medical Procedure Code`=='99203')|
                    (`Metaclaims Analytics Medical Procedure Code`=='99204')|
```

```
                    (`Metaclaims Analytics Medical Procedure Code`=='99205')|
                    (`Metaclaims Analytics Medical Procedure Code`=='99211')|
                    (`Metaclaims Analytics Medical Procedure Code`=='99212')|
                    (`Metaclaims Analytics Medical Procedure Code`=='99213')|
                    (`Metaclaims Analytics Medical Procedure Code`=='99214')|
                    (`Metaclaims Analytics Medical Procedure Code`=='99215')),
            diag1 = (`Metaclaims Analytics Medical Principal Diag`),
            cost_md = (`Metaclaims Analytics Medical Allowed Amount`)) %>%
   filter(dos<="2019-07-01")

ctr_sub = ctr
ctr_sub$Name = str_to_title(ctr$Name)
ctr_sub$`Primary Diagnosis` = as.character(gsub("[\\.]", "", ctr_sub$`Primary Diagnosis
`))

ctr_sub = ctr_sub %>%
   separate("Name",c("lastname","empty","firstname"),sep = "([\\, \\ ])", extra="drop", w
arn = "left") %>%
   mutate(dos = mdy(DOS)) %>%
   mutate(female= getmode((Gender=='F')),
          om_flag = as.logical(1),
          em_flag = ((CPT=='99201')|
                     (CPT=='99202')|
                     (CPT=='99203')|
                     (CPT=='99204')|
                     (CPT=='99205')|
                     (CPT=='99211')|
                     (CPT=='99212')|
                     (CPT=='99213')|
                     (CPT=='99214')|
                     (CPT=='99215')),
          pt_flag = ((Billing=='KSPANGENBE[109557787]')|
                     (Billing=='MMARCUCCIL[109565213]')),
          mh_flag = ((Billing=='Darling[109701110]')|
                       (Billing=='GFRANK[109571370]')),
          diag1 = getmode(`Primary Diagnosis`),
          pos = NA)

ctr_sub$pos[ctr_sub$mh_flag==1] = "Mental Health and Substance Use"
ctr_sub$pos[ctr_sub$pt_flag==1] = "Physical Medicine"

ctr_sub$pos[ctr_sub$CPT=="10060"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="10061"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="10120"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="11100"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="11200"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="11400"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="11401"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="11730"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="11740"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="11900"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="11982"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="17110"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="17111"] = "Surgery"
```

```
ctr_sub$pos[ctr_sub$CPT=="20553"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="20610"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="20612"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="36415"] = "Other"
ctr_sub$pos[ctr_sub$CPT=="69209"] = "Surgery"
ctr_sub$pos[ctr_sub$CPT=="86580"] = "Pathology Lab"
ctr_sub$pos[ctr_sub$CPT=="90460"] = "Administration of drug"
ctr_sub$pos[ctr_sub$CPT=="90471"] = "Administration of drug"
ctr_sub$pos[ctr_sub$CPT=="90472"] = "Administration of drug"
ctr_sub$pos[ctr_sub$CPT=="90632"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90649"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90651"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90656"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90656"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90670"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90674"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90686"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90691"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90707"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90713"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90714"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90715"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90716"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90732"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90734"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90736"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90746"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="90791"] = "Psychiatry"
ctr_sub$pos[ctr_sub$CPT=="90792"] = "Psychiatry"
ctr_sub$pos[ctr_sub$CPT=="90832"] = "Psychiatry"
ctr_sub$pos[ctr_sub$CPT=="90834"] = "Psychiatry"
ctr_sub$pos[ctr_sub$CPT=="90837"] = "Psychiatry"
ctr_sub$pos[ctr_sub$CPT=="90839"] = "Psychiatry"
ctr_sub$pos[ctr_sub$CPT=="96372"] = "Administration of drug"
ctr_sub$pos[ctr_sub$CPT=="97001"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97002"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97010"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97014"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97033"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97110"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97112"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97116"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97140"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97161"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97162"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97164"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97170"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="97530"] = "Physical Medicine"
ctr_sub$pos[ctr_sub$CPT=="99201"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99201"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99201"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99201"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99201"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99202"] = "Office Visits - PCP"
```

```
ctr_sub$pos[ctr_sub$CPT=="99203"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99204"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99212"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99213"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99214"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99215"] = "Office Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99243"] = "Consultations"
ctr_sub$pos[ctr_sub$CPT=="99244"] = "Consultations"
ctr_sub$pos[ctr_sub$CPT=="99384"] = "Preventive Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99385"] = "Preventive Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99386"] = "Preventive Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99395"] = "Preventive Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99396"] = "Preventive Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="99397"] = "Preventive Visits - PCP"
ctr_sub$pos[ctr_sub$CPT=="G0008"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="Q2038"] = "Immunizations"
ctr_sub$pos[ctr_sub$CPT=="J0696"] = "Administration of drug"
ctr_sub$pos[ctr_sub$CPT=="J1050"] = "Administration of drug"
ctr_sub$pos[ctr_sub$CPT=="J1885"] = "Administration of drug"
ctr_sub$pos[ctr_sub$CPT=="J3301"] = "Administration of drug"
ctr_sub$pos[is.na(ctr_sub$pos)==1 & (as.numeric(ctr_sub$CPT)>="10040" & as.numeric(ctr_s
ub$CPT)<="69210")] = "Surgery"
ctr_sub$pos[is.na(ctr_sub$pos)==1 & (as.numeric(ctr_sub$CPT)>="76801" & as.numeric(ctr_s
ub$CPT)<="76942")] = "Radiology"
ctr_sub$pos[is.na(ctr_sub$pos)==1 & (as.numeric(ctr_sub$CPT)>="90461" & as.numeric(ctr_s
ub$CPT)<="90474")] = "Administration of drug"
ctr_sub$pos[is.na(ctr_sub$pos)==1 & (as.numeric(ctr_sub$CPT)>="90461" & as.numeric(ctr_s
ub$CPT)<="90840")] = "Administration of drug"
ctr_sub$pos[is.na(ctr_sub$pos)==1 & (as.numeric(ctr_sub$CPT)>="93000" & as.numeric(ctr_s
ub$CPT)<="96160")] = "Other"
ctr_sub$pos[is.na(ctr_sub$pos)==1 & (as.numeric(ctr_sub$CPT)>="97032" & as.numeric(ctr_s
ub$CPT)<="98968")] = "Physical Medicine"
ctr_sub$pos[is.na(ctr_sub$pos)==1 & (as.numeric(ctr_sub$CPT)>="99173" & as.numeric(ctr_s
ub$CPT)<="99497")] = "Other"
ctr_sub$pos[is.na(ctr_sub$pos)==1] = "Administration of drug"

feesch_sub = feesch %>%
  mutate(cost_md = Fee) %>%
  select(CPT,cost_md)

ctr_sub = full_join(ctr_sub,feesch_sub,by="CPT")

ctr_sub$cost_md[is.na(ctr_sub$cost_md)==1] = ctr_sub$`Allowed - Contract`[is.na(ctr_sub
$cost_md)==1]

ctr_sub = ctr_sub %>%
  select(firstname,lastname,female,em_flag,om_flag,diag1,pos,cost_md)

clm_sub = full_join(clm_sub,feesch, by=c("Metaclaims Analytics Medical Procedure Code" =
"CPT")) %>%
  mutate(cost_md = replace_na(cost_md,0),
         om_flag = replace_na(om_flag,0))
clm_sub$cost_md[clm_sub$cost_md==0 & clm_sub$om_flag==1] = clm_sub$Fee[clm_sub$cost_md==
0 & clm_sub$om_flag==1]
```

# OM attribution and utilization counts

```
clm_sub$om_flag = as.logical(clm_sub$om_flag)

clm_tot = bind_rows(clm_sub,ctr_sub)

clm_tot = clm_tot %>%
  group_by(firstname, lastname,female) %>%
  # filter(any(em_flag==1)) %>%
  summarise(om_flag = getmode(om_flag[em_flag==1]),
            diag1 = getmode(diag1),
            count_drugadmin = sum((pos=="Administered drug inc Chemo")|(pos=="Administra
tion of drug")|(pos=="Immunizations")),
            cost_drugadmin =sum((cost_md[pos=="Administered drug inc Chemo"|pos=="Admini
stration of drug"|(pos=="Immunizations")])),
            cost_per_drugadmin = mean((cost_md[pos=="Administered drug inc Chemo"|pos==
"Administration of drug"|(pos=="Immunizations")]),na.rm=T),
            count_surg = sum((pos=="Anesthesia")|(pos=="Outpatient Surgery")|(pos=="Surg
ery")|(pos=="Surgical and Transplant")),
            cost_surg = sum(cost_md[(pos=="Anesthesia")|(pos=="Outpatient Surgery")|(pos
=="Surgery")|(pos=="Surgical and Transplant")]),
            cost_per_surg = mean(cost_md[(pos=="Anesthesia")|(pos=="Outpatient Surgery")
|(pos=="Surgery")|(pos=="Surgical and Transplant")],na.rm=T),
            count_maternity = sum(pos=="Labor and Delivery" | pos=="Newborns"),
            cost_maternity = sum(cost_md[(pos=="Labor and Delivery" | pos=="Newborns"
)]),
            cost_per_maternity = mean(cost_md[(pos=="Labor and Delivery" | pos=="Newborn
s")],na.rm=T),
            count_labs = sum(pos=="Lab Pathology" | pos=="Pathology Lab"),
            cost_labs = sum(cost_md[(pos=="Lab Pathology" | pos=="Pathology Lab")]),
            cost_per_labs = mean(cost_md[(pos=="Lab Pathology" | pos=="Pathology Lab")],
na.rm=T),
            count_er = sum(pos=="Emergency Room"),
            cost_er = sum(cost_md[pos=="Emergency Room"]),
            cost_per_er = mean(cost_md[pos=="Emergency Room"],na.rm=T),
            count_rads = sum(pos=="Radiology"),
            cost_rads = sum(cost_md[pos=="Radiology"]),
            cost_per_rads = mean(cost_md[pos=="Radiology"],na.rm=T),
            count_hosp = sum(pos=="Inpatient Visits"|pos=="Medical"),
            cost_hosp = sum(cost_md[pos=="Inpatient Visits"|pos=="Medical"]),
            cost_per_hosp = mean(cost_md[pos=="Inpatient Visits"|pos=="Medical"],na.rm=T
),
            count_pcp = sum(((pos=="Office Visits - PCP")|(pos=="Preventive Visits - PC
P"))),
            cost_pcp = sum((cost_md[(pos=="Office Visits - PCP"|pos=="Preventive Visits
 - PCP")])),
            cost_per_pcp = mean((cost_md[(pos=="Office Visits - PCP"|pos=="Preventive Vi
sits - PCP")]),na.rm=T),
            count_spec = sum((pos=="Office Visits - Specialist")|(pos=="Preventive Visit
s - Specialist")),
            cost_spec = sum((cost_md[pos=="Office Visits - Specialist"|pos=="Preventive
 Visits - Specialist"])),
            cost_per_spec = mean((cost_md[pos=="Office Visits - Specialist"|pos=="Preven
tive Visits - Specialist"]),na.rm=T),
            count_mh = sum(pos=="Mental Health and Substance Use" | pos=="Psychiatry"),
```

```
            cost_mh = sum(cost_md[pos=="Mental Health and Substance Use" | pos=="Psychia
try"]),
            cost_per_mh = mean(cost_md[pos=="Mental Health and Substance Use" | pos=="Ps
ychiatry"], na.rm=T),
            count_pt = sum(pos=="Physical Medicine"),
            cost_pt = sum(cost_md[pos=="Physical Medicine"]),
            cost_per_pt =  mean(cost_md[pos=="Physical Medicine"], na.rm=T),
            cost_other = sum(cost_md[(pos!="Administered drug inc Chemo")|(pos!="Adminis
tration of drug")|(pos!="Immunizations")|(pos!="Anesthesia")|(pos!="Outpatient Surgery")
|(pos!="Surgery")|(pos!="Surgical and Transplant")|(pos!="Labor and Delivery") | (pos!=
"Newborns")|(pos!="Lab Pathology") | (pos!="Pathology Lab")|(pos!="Emergency Room")|(po
s!="Radiology")|(pos!="Inpatient Visits")|(pos!="Medical")|(pos!="Inpatient Visits")|(po
s!="Medical")|(pos!="Office Visits - PCP")|(pos!="Preventive Visits - PCP")|(pos!="Offic
e Visits - Specialist")|(pos!="Preventive Visits - Specialist")|(pos!="Mental Health and
Substance Use" | pos!="Psychiatry")|(pos!="Physical Medicine")]),
            cost_md = sum(cost_other+cost_drugadmin+cost_surg+cost_maternity+cost_labs+c
ost_er+cost_rads+cost_hosp+cost_pcp+cost_spec+cost_mh+cost_pt)) %>%
    select(firstname,lastname, female,om_flag,diag1,cost_md,count_er,cost_er,count_hosp,co
st_hosp,count_pcp,cost_pcp,count_spec,cost_spec,count_mh,cost_mh,count_pt,cost_pt,count_
drugadmin,cost_drugadmin,count_surg,cost_surg,count_maternity,cost_maternity,count_labs,
cost_labs,count_rads,cost_rads,cost_per_drugadmin, cost_per_surg,cost_per_maternity,cost
_per_labs,cost_per_er,cost_per_rads,cost_per_hosp,cost_per_pcp,cost_per_spec,cost_per_m
h,cost_per_pt) %>%
    ungroup()
clm_tot$female[is.na(clm_tot$female)==1]=0
```

# Member org

```
mbr_sub = mbr
mbr_sub$`Analytics Member Months First Name` = str_to_title(mbr_sub$`Analytics Member Mo
nths First Name`)
mbr_sub$`Analytics Member Months Last Name` = str_to_title(mbr_sub$`Analytics Member Mon
ths Last Name`)

mbr_sub = mbr_sub %>%
  mutate(personid = `Analytics Member Months Person ID`) %>%
  group_by(personid) %>%
  mutate(start = min(`Analytics Member Months Start Date`),
         end = max(`Analytics Member Months End Date`),
         age = mean(`Analytics Member Months Age`),
         female = (`Analytics Member Months Gender`=='F'),
         firstname = `Analytics Member Months First Name`,
         lastname = `Analytics Member Months Last Name`,
         membermo = interval(start,end)/months(1),
         DOB = `Analytics Member Months Date of Birth Date`,
         zip = as.factor(`Analytics Member Months Current Postal Code`)) %>%
  select(age, female, personid, firstname, lastname, membermo, DOB, zip) %>%
  distinct()
```

# Add in pharmacy claims

```
rx_dol = rx
rx_dol$`Analytics Claims Pharmacy Allowed Amount` = as.numeric(gsub("[\\$,]", "", rx_dol
$`Analytics Claims Pharmacy Allowed Amount`))
rx_dol$`Analytics Claims Pharmacy First Name` = str_to_title(rx_dol$`Analytics Claims Ph
armacy First Name`)
rx_dol$`Analytics Claims Pharmacy Last Name` = str_to_title(rx_dol$`Analytics Claims Pha
rmacy Last Name`)

rx_sub = rx_dol %>%
  mutate(personid = `Analytics Claims Pharmacy Person ID`) %>%
  group_by(personid) %>%
  mutate(female = (`Analytics Claims Pharmacy Gender`=="F"),
         firstname = `Analytics Claims Pharmacy First Name`,
         lastname = `Analytics Claims Pharmacy Last Name`,
         cost_rx = sum(`Analytics Claims Pharmacy Allowed Amount`)) %>%
  select(female, personid, firstname,lastname,cost_rx) %>%
  distinct()
```

# HCC risk score

```
spacex_dat = mbr_sub %>%
  full_join(clm_tot, by = c("firstname","lastname","female")) %>%
  full_join(rx_sub, by = c("firstname","lastname","female")) %>%
  mutate(om_flag = replace_na(om_flag,0)) %>%
  distinct()


PERSON = spacex_dat %>%
  ungroup() %>%
  mutate(HICNO = personid.x,
         SEX = if_else(female==1,"F","M"),
         DOB = DOB,
         MCAID = 0,
         NMCAID = 0,
         OREC = 0) %>%
  select(HICNO, SEX, MCAID, NMCAID, OREC, DOB) %>%
  filter(!is.na(HICNO))


cmshcc_map <- load_cmshcc_map()

clm <- read_csv("spacex_claims.csv")

clm_hcc  = clm %>%
  mutate(HICNO = (`Metaclaims Analytics Medical Person ID`),
         diag1 = `Metaclaims Analytics Medical Principal Diag`,
         diag2 = `Metaclaims Analytics Medical Diag02`,
         diag3 = `Metaclaims Analytics Medical Diag03`,
         diag4 = `Metaclaims Analytics Medical Diag04`,
         diag5 = `Metaclaims Analytics Medical Diag05`,
         diag6 = `Metaclaims Analytics Medical Diag06`,
         diag7 = `Metaclaims Analytics Medical Diag07`,
         diag8 = `Metaclaims Analytics Medical Diag08`,
         diag9 = `Metaclaims Analytics Medical Diag09`,
         diag10 = `Metaclaims Analytics Medical Diag10`) %>%
  gather(Diag, DX, diag1:diag10, factor_key=T) %>%
  select(HICNO,DX) %>%
  arrange(HICNO)  %>%
  filter(!is.na(HICNO), !is.na(DX)) %>%
  distinct()

ctr_hcc = ctr
ctr_hcc$Name = str_to_title(ctr$Name)

ctr_hcc = ctr_hcc %>%
  separate("Name",c("lastname","empty","firstname"),sep = "([\\, \\ ])", extra="drop", w
arn = "left") %>%
  mutate(female= getmode((Gender=='F'))) %>%
  separate(`All Diagnosis`, into=c("diag1","diag2","diag3","diag4","diag5","diag6","diag
7","diag8","diag9","diag10"), sep = ", ", extra = "drop", warn = "left") %>%
  full_join(mbr_sub, by = c("firstname","lastname","female"))  %>%
  select(personid, diag1, diag2, diag3, diag4, diag5, diag6, diag7, diag8, diag9, diag1
0)  %>%
  mutate(HICNO= personid) %>%
  gather(Diag, DX, diag1:diag10, factor_key=T) %>%
```

```
  select(HICNO,DX) %>%
  arrange(HICNO)  %>%
  filter(!is.na(HICNO), !is.na(DX)) %>%
  distinct()

DIAG = bind_rows(clm_hcc, ctr_hcc)

hcc = evaluate_v22_2017(PERSON, DIAG, "Community_NonDual_Aged")
```

# CCS cat

```
ccs <- read_csv("ccs_dx_icd10cm_2018_1.csv")
ccs  =ccs %>%
  mutate(diag1 = `ICD-10-CM CODE`,
         ccs = `CCS CATEGORY`) %>%
  select(diag1, ccs)
```

# Pre-match

```
spacex_dat_ana = mbr_sub %>%
  full_join(clm_tot, by = c("firstname","lastname","female")) %>%
  full_join(rx_sub, by = c("firstname","lastname","female")) %>%
  full_join(hcc, by = c("personid.x" = "HICNO")) %>%
  left_join(ccs, c("diag1")) %>%
  filter(!is.na(personid.x)) %>%
mutate(mm = membermo,
       om_flag = replace_na(om_flag,0),
       cost_md = replace_na(cost_md,0),
       count_er = replace_na(count_er,0),
       cost_er = replace_na(cost_er,0),
       count_hosp = replace_na(count_hosp,0),
       cost_hosp = replace_na(cost_hosp,0),
       count_pcp = replace_na(count_pcp,0),
       cost_pcp = replace_na(cost_pcp,0),
       count_spec = replace_na(count_spec,0),
       cost_spec = replace_na(cost_spec,0),
       count_mh = replace_na(count_mh,0),
       count_pt = replace_na(count_pt,0),
       cost_pt = replace_na(cost_pt,0),
       cost_mh = replace_na(cost_mh,0),
       cost_rx = replace_na(cost_rx,0),
       cost_md = (cost_md+cost_rx)/mm,
       cost_rx = (cost_rx)/mm,
       cost_er = (cost_er)/mm,
       cost_hosp = (cost_hosp)/mm,
       cost_pcp = (cost_pcp)/mm,
       cost_spec = (cost_spec)/mm,
       cost_mh = (cost_mh)/mm,
       cost_pt = (cost_pt)/mm,
       count_er = (count_er)/mm,
       count_hosp = (count_hosp)/mm,
       count_pcp = (count_pcp)/mm,
       count_spec = (count_spec)/mm,
       count_mh = (count_mh)/mm,
       count_pt = (count_pt)/mm,
       count_drugadmin = (count_drugadmin)/mm,
       cost_drugadmin = (cost_drugadmin)/mm,
       count_surg = (count_surg)/mm,
       cost_surg = (cost_surg)/mm,
       count_maternity = (count_maternity)/mm,
       cost_maternity = (cost_maternity)/mm,
       count_labs = (count_labs)/mm,
       cost_labs = (cost_labs)/mm,
       count_rads = (count_rads)/mm,
       cost_rads = (cost_rads)/mm,
       count_drugadmin = replace_na(count_drugadmin,0),
       cost_drugadmin = replace_na(cost_drugadmin,0),
       count_surg = replace_na(count_surg,0),
       cost_surg = replace_na(cost_surg,0),
       count_maternity = replace_na(count_maternity,0),
       cost_maternity = replace_na(cost_maternity,0),
       count_labs = replace_na(count_labs,0),
```

```
        cost_labs = replace_na(cost_labs, 0),
        count_rads = replace_na(count_rads, 0),
        cost_rads = replace_na(cost_rads,0),
        Community_NonDual_Aged = replace_na(Community_NonDual_Aged,0),
        hcc = Community_NonDual_Aged,
        ccs = replace_na(ccs,0),
        mm = membermo,
        ccs = as.factor(ccs),
        zip = as.factor(zip))


# monthly membership cost
membership_pmpm = 7020265 / (3650 + 4332 + 4996 + 4544) * 2/3 /12 /2

spacex_dat_ana$cost_md[spacex_dat_ana$om_flag==1] = membership_pmpm + spacex_dat_ana$cos
t_md[spacex_dat_ana$om_flag==1]

summary(spacex_dat_ana)
```

```
##      age             female          personid.x        firstname
##  Min.   : 0.00    Mode :logical    Min.   :182259    Length:23518
##  1st Qu.:16.20    FALSE:14607      1st Qu.:226238    Class :character
##  Median :27.80    TRUE :8911       Median :238841    Mode  :character
##  Mean   :26.95                     Mean   :339844
##  3rd Qu.:35.80                     3rd Qu.:380059
##  Max.   :79.33                     Max.   :848253
##
##    lastname          membermo            DOB
##  Length:23518      Min.   : 0.5484    Min.   :1938-02-02
##  Class :character  1st Qu.:13.9677    1st Qu.:1981-10-15
##  Mode  :character  Median :28.9677    Median :1989-11-30
##                    Mean   :28.7119    Mean   :1990-08-25
##                    3rd Qu.:47.9677    3rd Qu.:2001-04-16
##                    Max.   :47.9677    Max.   :2019-08-12
##
##      zip             om_flag            diag1
##  Length:23518      Min.   :0.00000    Length:23518
##  Class :character  1st Qu.:0.00000    Class :character
##  Mode  :character  Median :0.00000    Mode  :character
##                    Mean   :0.08389
##                    3rd Qu.:0.00000
##                    Max.   :1.00000
##
##     cost_md           count_er          cost_er          count_hosp
##  Min.   :    0.00   Min.   : 0.0000   Min.   :   0.00   Min.   :0.00000
##  1st Qu.:    0.00   1st Qu.: 0.0000   1st Qu.:   0.00   1st Qu.:0.00000
##  Median :   78.63   Median : 0.0000   Median :   0.00   Median :0.00000
##  Mean   :  561.90   Mean   : 0.0988   Mean   :  33.76   Mean   :0.01699
##  3rd Qu.:  348.85   3rd Qu.: 0.0000   3rd Qu.:   0.00   3rd Qu.:0.00000
##  Max.   :91100.95   Max.   :25.4098   Max.   :6029.73   Max.   :9.91498
##
##    cost_hosp          count_pcp          cost_pcp
##  Min.   :    0.00   Min.   : 0.00000   Min.   :   0.000
##  1st Qu.:    0.00   1st Qu.: 0.00000   1st Qu.:   0.000
##  Median :    0.00   Median : 0.08339   Median :   9.936
##  Mean   :   29.83   Mean   : 0.18478   Mean   :  22.356
##  3rd Qu.:    0.00   3rd Qu.: 0.22302   3rd Qu.:  26.721
##  Max.   :32221.89   Max.   :39.31034   Max.   :3108.476
##
##    count_spec         cost_spec          count_mh
##  Min.   : 0.00000   Min.   :   0.000   Min.   : 0.00000
##  1st Qu.: 0.00000   1st Qu.:   0.000   1st Qu.: 0.00000
##  Median : 0.00000   Median :   0.000   Median : 0.00000
##  Mean   : 0.06945   Mean   :   7.665   Mean   : 0.03155
##  3rd Qu.: 0.07151   3rd Qu.:   8.207   3rd Qu.: 0.00000
##  Max.   :24.88889   Max.   :2008.533   Max.   :20.16260
##
##    cost_mh            count_pt           cost_pt
##  Min.   :   0.000   Min.   : 0.0000   Min.   :   0.000
##  1st Qu.:   0.000   1st Qu.: 0.0000   1st Qu.:   0.000
##  Median :   0.000   Median : 0.0000   Median :   0.000
##  Mean   :   6.998   Mean   : 0.1891   Mean   :   8.091
```

```
## 3rd Qu.:    0.000   3rd Qu.: 0.0000   3rd Qu.:    0.000
## Max.   :7718.156   Max.   :69.6230   Max.   :2315.029
##
## count_drugadmin   cost_drugadmin      count_surg
## Min.   : 0.00000   Min.   :    0.00   Min.   : 0.00000
## 1st Qu.: 0.00000   1st Qu.:    0.00   1st Qu.: 0.00000
## Median : 0.00000   Median :    0.00   Median : 0.00000
## Mean   : 0.13137   Mean   :   14.58   Mean   : 0.08009
## 3rd Qu.: 0.09764   3rd Qu.:    2.87   3rd Qu.: 0.03452
## Max.   :17.78689   Max.   :39264.82   Max.   :24.59987
##
##    cost_surg       count_maternity    cost_maternity
## Min.   :    0.00   Min.   :0.000000   Min.   :    0.00
## 1st Qu.:    0.00   1st Qu.:0.000000   1st Qu.:    0.00
## Median :    0.00   Median :0.000000   Median :    0.00
## Mean   :   75.45   Mean   :0.002373   Mean   :   23.28
## 3rd Qu.:    2.75   3rd Qu.:0.000000   3rd Qu.:    0.00
## Max.   :39217.02   Max.   :3.020134   Max.   :36858.13
##
##    count_labs         cost_labs         count_rads
## Min.   :  0.00000   Min.   :    0.000   Min.   :0.00000
## 1st Qu.:  0.00000   1st Qu.:    0.000   1st Qu.:0.00000
## Median :  0.06254   Median :    0.440   Median :0.00000
## Mean   :  0.39116   Mean   :   12.665   Mean   :0.07329
## 3rd Qu.:  0.39610   3rd Qu.:    7.602   3rd Qu.:0.06254
## Max.   :112.75862   Max.   :4419.551   Max.   :9.85158
##
##    cost_rads       cost_per_drugadmin cost_per_surg
## Min.   :   0.000   Min.   :    0.00   Min.   :    0.00
## 1st Qu.:   0.000   1st Qu.:   21.64   1st Qu.:   89.58
## Median :   0.000   Median :   36.86   Median :  196.05
## Mean   :  14.041   Mean   :   74.21   Mean   :  630.14
## 3rd Qu.:   3.194   3rd Qu.:   69.79   3rd Qu.:  503.66
## Max.   :8152.876   Max.   :44224.81   Max.   :56556.45
##                    NA's   :14261      NA's   :16329
## cost_per_maternity cost_per_labs     cost_per_er      cost_per_rads
## Min.   :      0    Min.   :  0.00   Min.   :   0.0   Min.   :   0.00
## 1st Qu.:   2066    1st Qu.: 11.22   1st Qu.: 242.1   1st Qu.:  36.38
## Median :   7369    Median : 17.99   Median : 328.3   Median :  83.52
## Mean   :  12702    Mean   : 27.59   Mean   : 387.6   Mean   : 140.89
## 3rd Qu.:  13730    3rd Qu.: 29.33   3rd Qu.: 457.4   3rd Qu.: 160.20
## Max.   :1029625    Max.   :841.77   Max.   :4025.4   Max.   :3566.60
## NA's   :22690      NA's   :10387    NA's   :18779    NA's   :14920
## cost_per_hosp      cost_per_pcp      cost_per_spec      cost_per_mh
## Min.   :    0.0   Min.   :  0.00   Min.   :  0.00   Min.   :    0.00
## 1st Qu.:  103.3   1st Qu.: 98.23   1st Qu.: 90.56   1st Qu.:   80.86
## Median :  189.8   Median :119.76   Median :113.22   Median :  122.25
## Mean   : 1355.4   Mean   :130.09   Mean   :117.45   Mean   :  303.37
## 3rd Qu.: 1310.1   3rd Qu.:154.35   3rd Qu.:137.93   3rd Qu.:  173.09
## Max.   :87309.1   Max.   :659.14   Max.   :675.00   Max.   :36599.00
## NA's   :21896     NA's   :8026     NA's   :13698    NA's   :21288
##  cost_per_pt       personid.y        cost_rx
## Min.   :    0.00   Min.   :186028   Min.   :    0.00
## 1st Qu.:   24.58   1st Qu.:225194   1st Qu.:    0.00
```

```
##   Median :   38.51   Median :230004   Median :     0.87
##   Mean   :   50.66   Mean   :302959   Mean   :    48.19
##   3rd Qu.:   67.41   3rd Qu.:345704   3rd Qu.:     9.48
##   Max.   :1200.00    Max.   :840239   Max.   :83586.29
##   NA's   :19535      NA's   :9195
##   Community_NonDual_Aged       ccs                    mm
##   Min.   :0.00000       Length:23518       Min.   :  0.5484
##   1st Qu.:0.00000       Class :character   1st Qu.:13.9677
##   Median :0.00000       Mode  :character   Median :28.9677
##   Mean   :0.09794                          Mean   :28.7119
##   3rd Qu.:0.00000                          3rd Qu.:47.9677
##   Max.   :9.53700                          Max.   :47.9677
##
##        hcc
##   Min.   :0.00000
##   1st Qu.:0.00000
##   Median :0.00000
##   Mean   :0.09794
##   3rd Qu.:0.00000
##   Max.   :9.53700
##
```

```
tempData = mice(spacex_dat_ana, m = 1, maxit = 1, meth = 'pmm', seed = 123)
```

```
##
## iter imp variable
##  1   1 cost_per_drugadmin  cost_per_surg  cost_per_maternity  cost_per_labs  cost_p
er_er  cost_per_rads  cost_per_hosp  cost_per_pcp  cost_per_spec  cost_per_mh  cost_per_
pt  personid.y
```

```
spacex_dat_nomiss <- as.data.frame(complete(tempData,1))
summary(spacex_dat_nomiss)
```

```
##       age            female          personid.x        firstname
##   Min.   : 0.00   Mode :logical   Min.   :182259   Length:23518
##   1st Qu.:16.20   FALSE:14607     1st Qu.:226238   Class :character
##   Median :27.80   TRUE :8911      Median :238841   Mode  :character
##   Mean   :26.95                   Mean   :339844
##   3rd Qu.:35.80                   3rd Qu.:380059
##   Max.   :79.33                   Max.   :848253
##     lastname           membermo            DOB
##   Length:23518     Min.   : 0.5484   Min.   :1938-02-02
##   Class :character  1st Qu.:13.9677   1st Qu.:1981-10-15
##   Mode  :character  Median :28.9677   Median :1989-11-30
##                     Mean   :28.7119   Mean   :1990-08-25
##                     3rd Qu.:47.9677   3rd Qu.:2001-04-16
##                     Max.   :47.9677   Max.   :2019-08-12
##      zip             om_flag           diag1
##   Length:23518     Min.   :0.00000   Length:23518
##   Class :character  1st Qu.:0.00000   Class :character
##   Mode  :character  Median :0.00000   Mode  :character
##                     Mean   :0.08389
##                     3rd Qu.:0.00000
##                     Max.   :1.00000
##     cost_md           count_er          cost_er          count_hosp
##   Min.   :    0.00   Min.   : 0.0000   Min.   :    0.00   Min.   :0.00000
##   1st Qu.:    0.00   1st Qu.: 0.0000   1st Qu.:    0.00   1st Qu.:0.00000
##   Median :   78.63   Median : 0.0000   Median :    0.00   Median :0.00000
##   Mean   :  561.90   Mean   : 0.0988   Mean   :   33.76   Mean   :0.01699
##   3rd Qu.:  348.85   3rd Qu.: 0.0000   3rd Qu.:    0.00   3rd Qu.:0.00000
##   Max.   :91100.95   Max.   :25.4098   Max.   :6029.73   Max.   :9.91498
##     cost_hosp          count_pcp          cost_pcp
##   Min.   :    0.00   Min.   : 0.00000   Min.   :    0.000
##   1st Qu.:    0.00   1st Qu.: 0.00000   1st Qu.:    0.000
##   Median :    0.00   Median : 0.08339   Median :    9.936
##   Mean   :   29.83   Mean   : 0.18478   Mean   :   22.356
##   3rd Qu.:    0.00   3rd Qu.: 0.22302   3rd Qu.:   26.721
##   Max.   :32221.89   Max.   :39.31034   Max.   :3108.476
##     count_spec         cost_spec          count_mh
##   Min.   : 0.00000   Min.   :    0.000   Min.   : 0.00000
##   1st Qu.: 0.00000   1st Qu.:    0.000   1st Qu.: 0.00000
##   Median : 0.00000   Median :    0.000   Median : 0.00000
##   Mean   : 0.06945   Mean   :    7.665   Mean   : 0.03155
##   3rd Qu.: 0.07151   3rd Qu.:    8.207   3rd Qu.: 0.00000
##   Max.   :24.88889   Max.   :2008.533   Max.   :20.16260
##     cost_mh            count_pt           cost_pt
##   Min.   :   0.000   Min.   : 0.0000   Min.   :    0.000
##   1st Qu.:   0.000   1st Qu.: 0.0000   1st Qu.:    0.000
##   Median :   0.000   Median : 0.0000   Median :    0.000
##   Mean   :   6.998   Mean   : 0.1891   Mean   :    8.091
##   3rd Qu.:   0.000   3rd Qu.: 0.0000   3rd Qu.:    0.000
##   Max.   :7718.156   Max.   :69.6230   Max.   :2315.029
##   count_drugadmin    cost_drugadmin       count_surg
##   Min.   : 0.00000   Min.   :    0.00   Min.   : 0.00000
##   1st Qu.: 0.00000   1st Qu.:    0.00   1st Qu.: 0.00000
##   Median : 0.00000   Median :    0.00   Median : 0.00000
```

```
##    Mean    : 0.13137    Mean    :   14.58    Mean    : 0.08009
##    3rd Qu.: 0.09764    3rd Qu.:    2.87    3rd Qu.: 0.03452
##    Max.    :17.78689    Max.    :39264.82    Max.    :24.59987
##      cost_surg          count_maternity    cost_maternity
##    Min.    :    0.00    Min.    :0.000000    Min.    :    0.00
##    1st Qu.:    0.00    1st Qu.:0.000000    1st Qu.:    0.00
##    Median :    0.00    Median :0.000000    Median :    0.00
##    Mean    :   75.45    Mean    :0.002373    Mean    :   23.28
##    3rd Qu.:    2.75    3rd Qu.:0.000000    3rd Qu.:    0.00
##    Max.    :39217.02    Max.    :3.020134    Max.    :36858.13
##      count_labs          cost_labs          count_rads
##    Min.    :  0.00000    Min.    :    0.000    Min.    :0.00000
##    1st Qu.:  0.00000    1st Qu.:    0.000    1st Qu.:0.00000
##    Median :  0.06254    Median :    0.440    Median :0.00000
##    Mean    :  0.39116    Mean    :   12.665    Mean    :0.07329
##    3rd Qu.:  0.39610    3rd Qu.:    7.602    3rd Qu.:0.06254
##    Max.    :112.75862    Max.    :4419.551    Max.    :9.85158
##      cost_rads          cost_per_drugadmin cost_per_surg
##    Min.    :    0.000    Min.    :    0.00    Min.    :    0.00
##    1st Qu.:    0.000    1st Qu.:   21.32    1st Qu.:   89.75
##    Median :    0.000    Median :   35.59    Median :  193.53
##    Mean    :   14.041    Mean    :   64.54    Mean    :  486.25
##    3rd Qu.:    3.194    3rd Qu.:   66.97    3rd Qu.:  487.86
##    Max.    :8152.876    Max.    :44224.81    Max.    :56556.45
##    cost_per_maternity cost_per_labs      cost_per_er        cost_per_rads
##    Min.    :      0    Min.    :  0.00    Min.    :    0.0    Min.    :    0.00
##    1st Qu.:    1017    1st Qu.: 11.07    1st Qu.: 242.7    1st Qu.:   33.82
##    Median :    3300    Median : 17.77    Median : 323.2    Median :   72.30
##    Mean    :    6615    Mean    : 26.15    Mean    : 366.6    Mean    :  121.75
##    3rd Qu.:    9463    3rd Qu.: 28.46    3rd Qu.: 440.1    3rd Qu.:  140.04
##    Max.    :1029625    Max.    :841.77    Max.    :4025.4    Max.    :3566.60
##    cost_per_hosp      cost_per_pcp      cost_per_spec      cost_per_mh
##    Min.    :    0.0    Min.    :  0.00    Min.    :    0.0    Min.    :    0.00
##    1st Qu.:  109.6    1st Qu.: 99.15    1st Qu.: 92.8    1st Qu.:   72.74
##    Median :  201.8    Median :119.44    Median :113.6    Median :  108.33
##    Mean    : 1388.9    Mean    :128.71    Mean    :118.2    Mean    :  151.07
##    3rd Qu.: 1730.0    3rd Qu.:150.34    3rd Qu.:138.1    3rd Qu.:  162.41
##    Max.    :87309.1    Max.    :659.14    Max.    :675.0    Max.    :36599.00
##      cost_per_pt          personid.y          cost_rx
##    Min.    :    0.00    Min.    :186028    Min.    :    0.00
##    1st Qu.:   24.63    1st Qu.:226375    1st Qu.:    0.00
##    Median :   36.47    Median :238524    Median :    0.87
##    Mean    :   46.04    Mean    :335530    Mean    :   48.19
##    3rd Qu.:   62.31    3rd Qu.:369843    3rd Qu.:    9.48
##    Max.    :1200.00    Max.    :840239    Max.    :83586.29
##    Community_NonDual_Aged      ccs                    mm
##    Min.    :0.00000          Length:23518      Min.    : 0.5484
##    1st Qu.:0.00000          Class :character    1st Qu.:13.9677
##    Median :0.00000          Mode  :character    Median :28.9677
##    Mean    :0.09794                            Mean    :28.7119
##    3rd Qu.:0.00000                            3rd Qu.:47.9677
##    Max.    :9.53700                            Max.    :47.9677
##        hcc
##    Min.    :0.00000
```

```
##   1st Qu.:0.00000
##   Median :0.00000
##   Mean   :0.09794
##   3rd Qu.:0.00000
##   Max.   :9.53700
```

# Matching

```r
spacex_dat_cov <- c('age', 'female', 'mm', 'membermo', 'hcc', 'ccs', 'diag1',  'zip')

spacex_dat_nomiss = spacex_dat_nomiss %>%
  mutate(diag1=replace_na(diag1,0),
         zip = replace_na(zip,0))

#spacex_dat_nomiss = as.data.frame(spacex_dat_ana)

start_time <- Sys.time()

set.seed(1)
mod_match <- matchit(om_flag ~ age + female + ccs + hcc + mm +  zip,
                     method = "nearest", data = spacex_dat_nomiss, caliper = .10)
end_time <- Sys.time()

end_time - start_time
```

```
## Time difference of 36.10747 mins
```

```r
mod_match
```

```
##
## Call:
## matchit(formula = om_flag ~ age + female + ccs + hcc + mm + zip,
##     data = spacex_dat_nomiss, method = "nearest", caliper = 0.1)
##
## Sample sizes:
##            Control Treated
## All          21545    1973
## Matched       1584    1584
## Unmatched    19961     389
## Discarded        0       0
```

```r
save.image("onemedical.RData")

dta_m <- match.data(mod_match)
dim(dta_m)
```

```
## [1] 3168   52
```

```
dta_m %>%
  group_by(om_flag) %>%
  select(one_of(spacex_dat_cov)) %>%
  summarise_all(funs(mean))
```

```
## # A tibble: 2 x 9
##   om_flag   age female    mm membermo    hcc   ccs diag1   zip
##     <dbl> <dbl>  <dbl> <dbl>    <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1       0  31.1  0.165  33.2     33.2 0.0841    NA    NA    NA
## 2       1  30.6  0.171  33.3     33.3 0.0771    NA    NA    NA
```

```
print(CreateTableOne(vars = c("age", "female", "hcc", "mm",  "ccs", "zip"), strata = "om
_flag", data = dta_m, test = T), smd = TRUE, noSpaces = TRUE)
```

```
##                     Stratified by om_flag
##                      0              1              p      test SMD
##   n                  1584           1584
##   age (mean (SD))    31.06 (14.54)  30.56 (8.37)   0.235       0.042
##   female = TRUE (%)  262 (16.5)     271 (17.1)     0.704       0.015
##   hcc (mean (SD))    0.08 (0.21)    0.08 (0.19)    0.319       0.035
##   mm (mean (SD))     33.16 (14.30)  33.34 (13.74)  0.730       0.012
##   ccs (%)                                          1.000       0.238
##      0               4 (0.3)        0 (0.0)
##      10              347 (21.9)     364 (23.0)
##      102             14 (0.9)       12 (0.8)
##      106             14 (0.9)       17 (1.1)
##      117             3 (0.2)        3 (0.2)
##      119             2 (0.1)        1 (0.1)
##      122             2 (0.1)        1 (0.1)
##      123             3 (0.2)        5 (0.3)
##      124             5 (0.3)        3 (0.2)
##      125             6 (0.4)        6 (0.4)
##      126             28 (1.8)       38 (2.4)
##      127             2 (0.1)        2 (0.1)
##      128             7 (0.4)        5 (0.3)
##      130             1 (0.1)        1 (0.1)
##      133             10 (0.6)       9 (0.6)
##      134             16 (1.0)       13 (0.8)
##      137             3 (0.2)        3 (0.2)
##      138             4 (0.3)        1 (0.1)
##      140             2 (0.1)        2 (0.1)
##      141             3 (0.2)        2 (0.1)
##      142             0 (0.0)        2 (0.1)
##      143             3 (0.2)        5 (0.3)
##      147             1 (0.1)        1 (0.1)
##      151             1 (0.1)        2 (0.1)
##      154             4 (0.3)        4 (0.3)
##      155             12 (0.8)       12 (0.8)
##      158             2 (0.1)        1 (0.1)
##      159             5 (0.3)        5 (0.3)
##      160             1 (0.1)        2 (0.1)
##      163             17 (1.1)       21 (1.3)
##      165             3 (0.2)        3 (0.2)
##      166             8 (0.5)        7 (0.4)
##      167             5 (0.3)        5 (0.3)
##      168             3 (0.2)        2 (0.1)
##      171             2 (0.1)        5 (0.3)
##      175             2 (0.1)        1 (0.1)
##      176             3 (0.2)        6 (0.4)
##      181             0 (0.0)        1 (0.1)
##      183             0 (0.0)        1 (0.1)
##      196             4 (0.3)        3 (0.2)
##      197             5 (0.3)        7 (0.4)
##      198             7 (0.4)        4 (0.3)
##      200             21 (1.3)       19 (1.2)
##      202             1 (0.1)        1 (0.1)
##      203             1 (0.1)        1 (0.1)
```

```
## 204      68 (4.3)     61 (3.9)
## 205      105 (6.6)    86 (5.4)
## 209      1 (0.1)      2 (0.1)
## 211      38 (2.4)     43 (2.7)
## 212      11 (0.7)     12 (0.8)
## 213      1 (0.1)      1 (0.1)
## 218      1 (0.1)      0 (0.0)
## 22       2 (0.1)      1 (0.1)
## 225      5 (0.3)      4 (0.3)
## 229      3 (0.2)      3 (0.2)
## 23       1 (0.1)      1 (0.1)
## 230      4 (0.3)      2 (0.1)
## 232      21 (1.3)     26 (1.6)
## 233      2 (0.1)      2 (0.1)
## 235      2 (0.1)      3 (0.2)
## 236      9 (0.6)      7 (0.4)
## 239      5 (0.3)      6 (0.4)
## 240      0 (0.0)      1 (0.1)
## 244      3 (0.2)      3 (0.2)
## 245      3 (0.2)      3 (0.2)
## 246      8 (0.5)      10 (0.6)
## 247      2 (0.1)      2 (0.1)
## 250      5 (0.3)      6 (0.4)
## 251      27 (1.7)     20 (1.3)
## 252      10 (0.6)     14 (0.9)
## 253      11 (0.7)     12 (0.8)
## 255      5 (0.3)      4 (0.3)
## 256      355 (22.4)   369 (23.3)
## 257      2 (0.1)      1 (0.1)
## 258      24 (1.5)     21 (1.3)
## 259      21 (1.3)     17 (1.1)
## 29       1 (0.1)      1 (0.1)
## 4        5 (0.3)      6 (0.4)
## 44       0 (0.0)      2 (0.1)
## 47       9 (0.6)      8 (0.5)
## 48       6 (0.4)      3 (0.2)
## 49       26 (1.6)     18 (1.1)
## 5        1 (0.1)      1 (0.1)
## 50       1 (0.1)      1 (0.1)
## 51       3 (0.2)      4 (0.3)
## 53       4 (0.3)      6 (0.4)
## 54       2 (0.1)      2 (0.1)
## 55       1 (0.1)      1 (0.1)
## 58       11 (0.7)     8 (0.5)
## 59       1 (0.1)      3 (0.2)
## 6        1 (0.1)      1 (0.1)
## 62       1 (0.1)      1 (0.1)
## 650      7 (0.4)      8 (0.5)
## 651      24 (1.5)     28 (1.8)
## 652      7 (0.4)      9 (0.6)
## 657      18 (1.1)     17 (1.1)
## 660      5 (0.3)      3 (0.2)
## 661      4 (0.3)      2 (0.1)
## 670      2 (0.1)      1 (0.1)
```

```
##      7              8 (0.5)        13 (0.8)
##      81             1 (0.1)         1 (0.1)
##      84            19 (1.2)        13 (0.8)
##      87             8 (0.5)         6 (0.4)
##      90             6 (0.4)         6 (0.4)
##      91             5 (0.3)         6 (0.4)
##      92             5 (0.3)         6 (0.4)
##      93             7 (0.4)         7 (0.4)
##      94            14 (0.9)        12 (0.8)
##      95            13 (0.8)        12 (0.8)
##      96             3 (0.2)         1 (0.1)
##      98            13 (0.8)        15 (0.9)
##   zip (%)                                            1.000      0.436
##      05201          1 (0.1)         1 (0.1)
##      11797          1 (0.1)         1 (0.1)
##      13045          1 (0.1)         1 (0.1)
##      20002          1 (0.1)         1 (0.1)
##      20005          0 (0.0)         1 (0.1)
##      22203          0 (0.0)         1 (0.1)
##      30107          1 (0.1)         1 (0.1)
##      31401          1 (0.1)         1 (0.1)
##      32780          1 (0.1)         2 (0.1)
##      32832          0 (0.0)         1 (0.1)
##      32901          0 (0.0)         1 (0.1)
##      32920          0 (0.0)         1 (0.1)
##      32931          1 (0.1)         1 (0.1)
##      32940          2 (0.1)         2 (0.1)
##      32952          1 (0.1)         2 (0.1)
##      32953          1 (0.1)         0 (0.0)
##      32955          2 (0.1)         2 (0.1)
##      33186          1 (0.1)         1 (0.1)
##      33710          1 (0.1)         1 (0.1)
##      34772          2 (0.1)         1 (0.1)
##      44094          1 (0.1)         0 (0.0)
##      48098          1 (0.1)         1 (0.1)
##      53202          1 (0.1)         0 (0.0)
##      55126          0 (0.0)         1 (0.1)
##      66227          1 (0.1)         1 (0.1)
##      70737          1 (0.1)         0 (0.0)
##      76502          0 (0.0)         1 (0.1)
##      76643          2 (0.1)         3 (0.2)
##      76702          0 (0.0)         1 (0.1)
##      76707          0 (0.0)         1 (0.1)
##      77005          1 (0.1)         1 (0.1)
##      77089          1 (0.1)         1 (0.1)
##      77573          2 (0.1)         1 (0.1)
##      78520          2 (0.1)         1 (0.1)
##      78521          3 (0.2)         4 (0.3)
##      78626          1 (0.1)         1 (0.1)
##      78681          1 (0.1)         1 (0.1)
##      78729          0 (0.0)         1 (0.1)
##      80111          0 (0.0)         1 (0.1)
##      80305          1 (0.1)         1 (0.1)
##      80917          1 (0.1)         1 (0.1)
```

```
## 84015        1 (0.1)     1 (0.1)
## 85251        0 (0.0)     1 (0.1)
## 85303        0 (0.0)     1 (0.1)
## 90001        5 (0.3)     5 (0.3)
## 90002        3 (0.2)     3 (0.2)
## 90003        1 (0.1)     1 (0.1)
## 90005        4 (0.3)     5 (0.3)
## 90006        1 (0.1)     2 (0.1)
## 90007        1 (0.1)     1 (0.1)
## 90008        4 (0.3)     5 (0.3)
## 90011        2 (0.1)     1 (0.1)
## 90012        4 (0.3)     3 (0.2)
## 90013        9 (0.6)     7 (0.4)
## 90014        4 (0.3)     5 (0.3)
## 90015        7 (0.4)     7 (0.4)
## 90016        4 (0.3)     4 (0.3)
## 90017        5 (0.3)     6 (0.4)
## 90018        3 (0.2)     3 (0.2)
## 90019        4 (0.3)     5 (0.3)
## 90020        2 (0.1)     2 (0.1)
## 90022        1 (0.1)     2 (0.1)
## 90024        3 (0.2)     3 (0.2)
## 90025       16 (1.0)    16 (1.0)
## 90026        7 (0.4)     7 (0.4)
## 90027        3 (0.2)     2 (0.1)
## 90028        1 (0.1)     2 (0.1)
## 90031        1 (0.1)     2 (0.1)
## 90032        1 (0.1)     1 (0.1)
## 90033        1 (0.1)     1 (0.1)
## 90034       19 (1.2)    18 (1.1)
## 90035        4 (0.3)     3 (0.2)
## 90036        4 (0.3)     4 (0.3)
## 90037        5 (0.3)     3 (0.2)
## 90039        4 (0.3)     4 (0.3)
## 90041        2 (0.1)     2 (0.1)
## 90042        2 (0.1)     3 (0.2)
## 90043        3 (0.2)     2 (0.1)
## 90044        9 (0.6)     4 (0.3)
## 90045       26 (1.6)    30 (1.9)
## 90046        2 (0.1)     2 (0.1)
## 90047        5 (0.3)     5 (0.3)
## 90048        2 (0.1)     2 (0.1)
## 90049        3 (0.2)     4 (0.3)
## 90056        1 (0.1)     2 (0.1)
## 90059        4 (0.3)     3 (0.2)
## 90061        4 (0.3)     2 (0.1)
## 90062        1 (0.1)     0 (0.0)
## 90064        5 (0.3)     4 (0.3)
## 90065        6 (0.4)     3 (0.2)
## 90066       24 (1.5)    24 (1.5)
## 90094        6 (0.4)     7 (0.4)
## 90201        3 (0.2)     2 (0.1)
## 90220        6 (0.4)    10 (0.6)
## 90221        2 (0.1)     2 (0.1)
```

```
##      90222          2 (0.1)         1 (0.1)
##      90230         14 (0.9)        13 (0.8)
##      90232          7 (0.4)         9 (0.6)
##      90240          1 (0.1)         4 (0.3)
##      90241          2 (0.1)         4 (0.3)
##      90242          4 (0.3)         4 (0.3)
##      90245         39 (2.5)        41 (2.6)
##      90247         28 (1.8)        19 (1.2)
##      90248          3 (0.2)         2 (0.1)
##      90249         11 (0.7)        12 (0.8)
##      90250         87 (5.5)        87 (5.5)
##      90254         63 (4.0)        64 (4.0)
##      90255          0 (0.0)         1 (0.1)
##      90260         35 (2.2)        33 (2.1)
##      90262         17 (1.1)         9 (0.6)
##      90266         24 (1.5)        34 (2.1)
##      90270          0 (0.0)         1 (0.1)
##      90274          2 (0.1)         4 (0.3)
##      90275         18 (1.1)        13 (0.8)
##      90277         52 (3.3)        52 (3.3)
##      90278         87 (5.5)        91 (5.7)
##      90280          8 (0.5)         9 (0.6)
##      90291         14 (0.9)        13 (0.8)
##      90292         24 (1.5)        24 (1.5)
##      90293         13 (0.8)        15 (0.9)
##      90301          4 (0.3)         5 (0.3)
##      90302          3 (0.2)         4 (0.3)
##      90303          8 (0.5)         9 (0.6)
##      90304          3 (0.2)         4 (0.3)
##      90305          2 (0.1)         2 (0.1)
##      90401          5 (0.3)         4 (0.3)
##      90403          8 (0.5)         8 (0.5)
##      90404         10 (0.6)         9 (0.6)
##      90405          8 (0.5)         9 (0.6)
##      90501         23 (1.5)        19 (1.2)
##      90502          5 (0.3)         6 (0.4)
##      90503         26 (1.6)        30 (1.9)
##      90504         28 (1.8)        27 (1.7)
##      90505         17 (1.1)        16 (1.0)
##      90510          1 (0.1)         1 (0.1)
##      90601          3 (0.2)         5 (0.3)
##      90603          1 (0.1)         1 (0.1)
##      90605          4 (0.3)         2 (0.1)
##      90620          2 (0.1)         3 (0.2)
##      90621          4 (0.3)         3 (0.2)
##      90630          6 (0.4)         6 (0.4)
##      90631          6 (0.4)         6 (0.4)
##      90638          5 (0.3)         4 (0.3)
##      90640          6 (0.4)         5 (0.3)
##      90650         14 (0.9)        13 (0.8)
##      90660          5 (0.3)         5 (0.3)
##      90670         11 (0.7)         7 (0.4)
##      90680          2 (0.1)         1 (0.1)
##      90701          1 (0.1)         4 (0.3)
```

```
##      90703        5 (0.3)        5 (0.3)
##      90706       13 (0.8)       11 (0.7)
##      90710        4 (0.3)        4 (0.3)
##      90712       14 (0.9)       13 (0.8)
##      90713        4 (0.3)        6 (0.4)
##      90715        5 (0.3)        4 (0.3)
##      90717        7 (0.4)        7 (0.4)
##      90720        1 (0.1)        1 (0.1)
##      90723        4 (0.3)        4 (0.3)
##      90731       12 (0.8)       16 (1.0)
##      90732        5 (0.3)        4 (0.3)
##      90740        1 (0.1)        1 (0.1)
##      90744       12 (0.8)        7 (0.4)
##      90745       17 (1.1)       14 (0.9)
##      90746        7 (0.4)        7 (0.4)
##      90802       21 (1.3)       15 (0.9)
##      90803       12 (0.8)       10 (0.6)
##      90804        9 (0.6)        7 (0.4)
##      90805       21 (1.3)       19 (1.2)
##      90806        6 (0.4)        7 (0.4)
##      90807        6 (0.4)        9 (0.6)
##      90808        4 (0.3)        5 (0.3)
##      90810        3 (0.2)        5 (0.3)
##      90813        4 (0.3)        6 (0.4)
##      90814        4 (0.3)        6 (0.4)
##      90815        6 (0.4)        3 (0.2)
##      91001        1 (0.1)        2 (0.1)
##      91006        1 (0.1)        1 (0.1)
##      91007        1 (0.1)        2 (0.1)
##      91011        2 (0.1)        1 (0.1)
##      91016        1 (0.1)        1 (0.1)
##      91030        4 (0.3)        3 (0.2)
##      91042        1 (0.1)        3 (0.2)
##      91104        1 (0.1)        1 (0.1)
##      91107        0 (0.0)        1 (0.1)
##      91202        1 (0.1)        1 (0.1)
##      91205        0 (0.0)        1 (0.1)
##      91206        2 (0.1)        1 (0.1)
##      91208        3 (0.2)        2 (0.1)
##      91302        1 (0.1)        1 (0.1)
##      91304        2 (0.1)        1 (0.1)
##      91307        4 (0.3)        1 (0.1)
##      91316        1 (0.1)        1 (0.1)
##      91320        2 (0.1)        1 (0.1)
##      91321        1 (0.1)        1 (0.1)
##      91325        2 (0.1)        1 (0.1)
##      91331        1 (0.1)        2 (0.1)
##      91340        0 (0.0)        1 (0.1)
##      91342        0 (0.0)        1 (0.1)
##      91343        3 (0.2)        2 (0.1)
##      91344        1 (0.1)        2 (0.1)
##      91345        2 (0.1)        1 (0.1)
##      91350        1 (0.1)        1 (0.1)
##      91352        1 (0.1)        1 (0.1)
```

```
## 91354        0 (0.0)        1 (0.1)
## 91360        0 (0.0)        1 (0.1)
## 91362        1 (0.1)        1 (0.1)
## 91364        1 (0.1)        2 (0.1)
## 91367        0 (0.0)        1 (0.1)
## 91384        1 (0.1)        1 (0.1)
## 91402        1 (0.1)        1 (0.1)
## 91405        1 (0.1)        1 (0.1)
## 91406        1 (0.1)        2 (0.1)
## 91423        3 (0.2)        3 (0.2)
## 91436        1 (0.1)        2 (0.1)
## 91501        3 (0.2)        1 (0.1)
## 91505        1 (0.1)        1 (0.1)
## 91510        1 (0.1)        1 (0.1)
## 91604        1 (0.1)        1 (0.1)
## 91606        0 (0.0)        1 (0.1)
## 91607        4 (0.3)        2 (0.1)
## 91701        1 (0.1)        2 (0.1)
## 91706        1 (0.1)        1 (0.1)
## 91709        4 (0.3)        2 (0.1)
## 91710        2 (0.1)        2 (0.1)
## 91711        2 (0.1)        1 (0.1)
## 91722        1 (0.1)        2 (0.1)
## 91730        3 (0.2)        4 (0.3)
## 91732        1 (0.1)        1 (0.1)
## 91733        0 (0.0)        1 (0.1)
## 91740        3 (0.2)        2 (0.1)
## 91744        0 (0.0)        1 (0.1)
## 91745        5 (0.3)        9 (0.6)
## 91746        0 (0.0)        1 (0.1)
## 91748        0 (0.0)        1 (0.1)
## 91750        0 (0.0)        2 (0.1)
## 91754        3 (0.2)        3 (0.2)
## 91761        1 (0.1)        1 (0.1)
## 91763        0 (0.0)        1 (0.1)
## 91764        0 (0.0)        1 (0.1)
## 91765        5 (0.3)        4 (0.3)
## 91767        1 (0.1)        1 (0.1)
## 91768        2 (0.1)        3 (0.2)
## 91770        0 (0.0)        2 (0.1)
## 91773        1 (0.1)        1 (0.1)
## 91775        2 (0.1)        1 (0.1)
## 91776        0 (0.0)        1 (0.1)
## 91780        1 (0.1)        0 (0.0)
## 91789        0 (0.0)        1 (0.1)
## 91790        3 (0.2)        2 (0.1)
## 91791        1 (0.1)        0 (0.0)
## 91801        4 (0.3)        2 (0.1)
## 91803        2 (0.1)        3 (0.2)
## 91942        1 (0.1)        1 (0.1)
## 91945        2 (0.1)        1 (0.1)
## 92083        0 (0.0)        1 (0.1)
## 92106        0 (0.0)        1 (0.1)
## 92122        1 (0.1)        1 (0.1)
```

```
##     92127        1 (0.1)      1 (0.1)
##     92307        3 (0.2)      1 (0.1)
##     92320        1 (0.1)      1 (0.1)
##     92335        2 (0.1)      1 (0.1)
##     92336        4 (0.3)      3 (0.2)
##     92345        3 (0.2)      4 (0.3)
##     92346        2 (0.1)      1 (0.1)
##     92385        1 (0.1)      1 (0.1)
##     92505        0 (0.0)      1 (0.1)
##     92530        1 (0.1)      1 (0.1)
##     92532        2 (0.1)      2 (0.1)
##     92553        2 (0.1)      2 (0.1)
##     92555        1 (0.1)      1 (0.1)
##     92557        1 (0.1)      1 (0.1)
##     92562        4 (0.3)      3 (0.2)
##     92570        2 (0.1)      2 (0.1)
##     92584        5 (0.3)      2 (0.1)
##     92604        1 (0.1)      1 (0.1)
##     92612        3 (0.2)      2 (0.1)
##     92614        2 (0.1)      2 (0.1)
##     92618        0 (0.0)      1 (0.1)
##     92620        3 (0.2)      4 (0.3)
##     92626        2 (0.1)      2 (0.1)
##     92630        3 (0.2)      1 (0.1)
##     92646        3 (0.2)      4 (0.3)
##     92647        2 (0.1)      4 (0.3)
##     92648        2 (0.1)      2 (0.1)
##     92649        4 (0.3)      6 (0.4)
##     92651        1 (0.1)      1 (0.1)
##     92656        2 (0.1)      2 (0.1)
##     92663        0 (0.0)      1 (0.1)
##     92673        3 (0.2)      1 (0.1)
##     92677        0 (0.0)      1 (0.1)
##     92679        2 (0.1)      1 (0.1)
##     92683        6 (0.4)      6 (0.4)
##     92688        2 (0.1)      1 (0.1)
##     92691        1 (0.1)      1 (0.1)
##     92692        3 (0.2)      2 (0.1)
##     92694        0 (0.0)      2 (0.1)
##     92703        1 (0.1)      2 (0.1)
##     92705        1 (0.1)      1 (0.1)
##     92706        2 (0.1)      1 (0.1)
##     92708        1 (0.1)      2 (0.1)
##     92780        1 (0.1)      0 (0.0)
##     92782        0 (0.0)      1 (0.1)
##     92801        2 (0.1)      1 (0.1)
##     92802        2 (0.1)      2 (0.1)
##     92804        9 (0.6)     11 (0.7)
##     92805        2 (0.1)      3 (0.2)
##     92806        7 (0.4)      5 (0.3)
##     92807        1 (0.1)      1 (0.1)
##     92821        1 (0.1)      1 (0.1)
##     92831        5 (0.3)      2 (0.1)
##     92832        1 (0.1)      1 (0.1)
```

```
##       92833          14 (0.9)        12 (0.8)
##       92835           1 (0.1)         0 (0.0)
##       92840           3 (0.2)         4 (0.3)
##       92843           0 (0.0)         1 (0.1)
##       92844           3 (0.2)         3 (0.2)
##       92860           0 (0.0)         1 (0.1)
##       92865           1 (0.1)         0 (0.0)
##       92867           4 (0.3)         3 (0.2)
##       92870           4 (0.3)         4 (0.3)
##       92879           0 (0.0)         1 (0.1)
##       92880           3 (0.2)         2 (0.1)
##       92881           2 (0.1)         1 (0.1)
##       92882           2 (0.1)         1 (0.1)
##       92883           4 (0.3)         2 (0.1)
##       93010           1 (0.1)         2 (0.1)
##       93021           4 (0.3)         2 (0.1)
##       93063           1 (0.1)         1 (0.1)
##       93065           2 (0.1)         3 (0.2)
##       93105           1 (0.1)         1 (0.1)
##       93110           0 (0.0)         1 (0.1)
##       93111           0 (0.0)         1 (0.1)
##       93277           1 (0.1)         0 (0.0)
##       93436           0 (0.0)         3 (0.2)
##       93454           1 (0.1)         1 (0.1)
##       93536           4 (0.3)         5 (0.3)
##       93552           0 (0.0)         1 (0.1)
##       93555           1 (0.1)         0 (0.0)
##       94010           0 (0.0)         1 (0.1)
##       94025           1 (0.1)         1 (0.1)
##       94063           3 (0.2)         2 (0.1)
##       94103           1 (0.1)         1 (0.1)
##       94110           1 (0.1)         0 (0.0)
##       94403           1 (0.1)         0 (0.0)
##       94506           1 (0.1)         0 (0.0)
##       94563           1 (0.1)         1 (0.1)
##       94566           0 (0.0)         1 (0.1)
##       94582           1 (0.1)         0 (0.0)
##       94611           1 (0.1)         1 (0.1)
##       94706           0 (0.0)         1 (0.1)
##       94903           0 (0.0)         1 (0.1)
##       95014           2 (0.1)         1 (0.1)
##       95060           1 (0.1)         1 (0.1)
##       95361           2 (0.1)         1 (0.1)
##       97045           1 (0.1)         1 (0.1)
##       97068           1 (0.1)         0 (0.0)
##       98004           0 (0.0)         2 (0.1)
##       98007           2 (0.1)         2 (0.1)
##       98012           0 (0.0)         1 (0.1)
##       98027           2 (0.1)         1 (0.1)
##       98052           1 (0.1)         1 (0.1)
##       98053           1 (0.1)         1 (0.1)
##       98075           1 (0.1)         1 (0.1)
##       98112           1 (0.1)         1 (0.1)
##       98118           1 (0.1)         1 (0.1)
```

# Outcome metrics

```
dta_run = dta_m %>%
  mutate(logcost_md = log(cost_md+1),
         logcost_er = log(cost_er+1),
         logcost_hosp = log(cost_hosp+1),
         logcost_pcp = log(cost_pcp+1),
         logcost_spec = log(cost_spec+1),
         logcost_mh = log(cost_mh+1),
         logcost_pt = log(cost_pt+1),
         logcost_rx = log(cost_rx+1),
         logcost_drugadmin = log(cost_drugadmin + 1),
         logcost_surg = log(cost_surg+1),
         logcost_maternity = log(cost_maternity+1),
         logcost_labs = log(cost_labs+1),
         logcost_rads = log(cost_rads +1),
        logcount_er = log(count_er+1),
        logcount_hosp = log(count_hosp+1),
        logcount_pcp = log(count_pcp+1),
        logcount_spec = log(count_spec+1),
        logcount_mh = log(count_mh+1),
        logcount_pt = log(count_pt+1),
        logcount_drugadmin = log(count_drugadmin+1),
        logcount_surg = log(count_surg+1),
        logcount_maternity = log(count_maternity+1),
        logcount_labs = log(count_labs+1),
        logcount_rads = log(count_rads+1),
        logcost_per_er = log(cost_per_er+1),
        logcost_per_hosp = log(cost_per_hosp+1),
        logcost_per_pcp = log(cost_per_pcp+1),
        logcost_per_spec = log(cost_per_spec+1),
        logcost_per_mh = log(cost_per_mh+1),
        logcost_per_pt = log(cost_per_pt+1),
        logcost_per_drugadmin = log(cost_per_drugadmin+1),
        logcost_per_surg = log(cost_per_surg+1),
        logcost_per_maternity = log(cost_per_maternity+1),
        logcost_per_labs = log(cost_per_labs+1),
        logcost_per_rads = log(cost_per_rads+1)
        )
```

```
# pre-match
prem = spacex_dat_ana %>%
  mutate(count_er = 1000*count_er,
         count_hosp = 1000*count_hosp,
         count_pcp = 1000*count_pcp,
         count_spec = 1000*count_spec,
         count_mh = 1000*count_mh,
         count_pt = 1000*count_pt,
         count_drugadmin = 1000*count_drugadmin,
         count_surg = 1000*count_surg,
         count_maternity = 1000*count_maternity,
         count_labs = 1000*count_labs,
         count_rads = 1000*count_rads
  )


pretable = CreateTableOne(data =prem, vars = c("age", "female", "hcc", "mm", "cost_md",
"cost_rx", "cost_er" ,"cost_hosp" , "cost_pcp"  , "cost_spec"  ,"cost_mh" ,"cost_pt" ,
"cost_drugadmin","cost_surg","cost_maternity","cost_labs","cost_rads", "count_er"  , "co
unt_hosp" ,"count_pcp" ,"count_spec", "count_mh",   "count_pt"  , "count_drugadmin","cou
nt_surg","count_maternity","count_labs","count_rads", "cost_per_er", "cost_per_hosp", "c
ost_per_pcp","cost_per_spec","cost_per_mh","cost_per_pt" ,"cost_per_drugadmin","cost_per
_surg"   ,"cost_per_maternity" ,"cost_per_labs", "cost_per_rads"), strata="om_flag", tes
t = T)
pretab = print(pretable, smd = TRUE, contDigits=1, catDigits=1, noSpaces = TRUE, quote =
T)
```

```
##                                       "Stratified by om_flag"
##     ""                                "0"                 "1"
##     "n"                               "21545"             "1973"
##     "age (mean (SD))"                 "26.6 (15.7)"       "30.6 (8.6)"
##     "female = TRUE (%)"               "8615 (40.0)"       "296 (15.0)"
##     "hcc (mean (SD))"                 "0.1 (0.4)"         "0.1 (0.2)"
##     "mm (mean (SD))"                  "28.3 (15.9)"       "32.7 (14.1)"
##     "cost_md (mean (SD))"             "591.5 (2993.4)"    "239.1 (537.1)"
##     "cost_rx (mean (SD))"             "50.3 (684.2)"      "25.3 (164.4)"
##     "cost_er (mean (SD))"             "34.7 (152.3)"      "23.0 (129.5)"
##     "cost_hosp (mean (SD))"           "32.0 (520.1)"      "6.0 (93.0)"
##     "cost_pcp (mean (SD))"            "21.7 (59.5)"       "29.8 (42.0)"
##     "cost_spec (mean (SD))"           "8.1 (25.6)"        "2.8 (6.4)"
##     "cost_mh (mean (SD))"             "7.0 (88.9)"        "7.0 (37.2)"
##     "cost_pt (mean (SD))"             "7.8 (47.9)"        "11.0 (49.5)"
##     "cost_drugadmin (mean (SD))"      "15.2 (345.3)"      "7.5 (85.0)"
##     "cost_surg (mean (SD))"           "80.9 (814.3)"      "16.2 (97.7)"
##     "cost_maternity (mean (SD))"      "25.4 (471.9)"      "0.6 (15.2)"
##     "cost_labs (mean (SD))"           "13.2 (81.9)"       "6.7 (15.6)"
##     "cost_rads (mean (SD))"           "14.8 (117.7)"      "5.6 (33.5)"
##     "count_er (mean (SD))"            "102.9 (466.0)"     "54.4 (229.5)"
##     "count_hosp (mean (SD))"          "18.3 (182.8)"      "3.2 (32.9)"
##     "count_pcp (mean (SD))"           "185.3 (526.0)"     "179.3 (249.9)"
##     "count_spec (mean (SD))"          "73.8 (242.8)"      "21.7 (45.1)"
##     "count_mh (mean (SD))"            "30.7 (277.5)"      "41.3 (203.7)"
##     "count_pt (mean (SD))"            "189.8 (1103.4)"    "182.3 (769.0)"
##     "count_drugadmin (mean (SD))"     "136.5 (626.8)"     "75.6 (217.4)"
##     "count_surg (mean (SD))"          "84.6 (382.6)"      "31.2 (103.1)"
##     "count_maternity (mean (SD))"     "2.6 (31.5)"        "0.0 (1.0)"
##     "count_labs (mean (SD))"          "398.7 (1464.0)"    "309.0 (502.4)"
##     "count_rads (mean (SD))"          "76.9 (241.3)"      "34.4 (98.7)"
##     "cost_per_er (mean (SD))"         "385.9 (278.1)"     "414.7 (354.0)"
##     "cost_per_hosp (mean (SD))"       "1318.8 (3759.1)"   "2504.6 (6220.3)"
##     "cost_per_pcp (mean (SD))"        "124.3 (47.4)"      "170.1 (39.6)"
##     "cost_per_spec (mean (SD))"       "116.8 (47.4)"      "126.6 (56.1)"
##     "cost_per_mh (mean (SD))"         "319.3 (1263.6)"    "198.1 (337.1)"
##     "cost_per_pt (mean (SD))"         "48.0 (58.9)"       "66.6 (41.0)"
##     "cost_per_drugadmin (mean (SD))"  "74.2 (531.7)"      "74.5 (111.7)"
##     "cost_per_surg (mean (SD))"       "650.2 (2384.6)"    "373.7 (1607.5)"
##     "cost_per_maternity (mean (SD))"  "12699.0 (41963.4)" "13319.2 (10574.6)"
##     "cost_per_labs (mean (SD))"       "27.8 (36.7)"       "25.8 (29.4)"
##     "cost_per_rads (mean (SD))"       "141.6 (195.7)"     "131.9 (199.3)"
##                                       "Stratified by om_flag"
##     ""                                "p"        "test" "SMD"
##     "n"                               ""         ""     ""
##     "age (mean (SD))"                 "<0.001"   ""     "0.312"
##     "female = TRUE (%)"               "<0.001"   ""     "0.583"
##     "hcc (mean (SD))"                 "<0.001"   ""     "0.102"
##     "mm (mean (SD))"                  "<0.001"   ""     "0.293"
##     "cost_md (mean (SD))"             "<0.001"   ""     "0.164"
##     "cost_rx (mean (SD))"             "0.106"    ""     "0.050"
##     "cost_er (mean (SD))"             "0.001"    ""     "0.083"
##     "cost_hosp (mean (SD))"           "0.026"    ""     "0.070"
```

```
##   "cost_pcp (mean (SD))"            "<0.001" ""    "0.158"
##   "cost_spec (mean (SD))"           "<0.001" ""    "0.286"
##   "cost_mh (mean (SD))"             "0.982"  ""    "0.001"
##   "cost_pt (mean (SD))"             "0.005"  ""    "0.065"
##   "cost_drugadmin (mean (SD))"      "0.318"  ""    "0.031"
##   "cost_surg (mean (SD))"           "<0.001" ""    "0.111"
##   "cost_maternity (mean (SD))"      "0.020"  ""    "0.074"
##   "cost_labs (mean (SD))"           "<0.001" ""    "0.110"
##   "cost_rads (mean (SD))"           "0.001"  ""    "0.106"
##   "count_er (mean (SD))"            "<0.001" ""    "0.132"
##   "count_hosp (mean (SD))"          "<0.001" ""    "0.115"
##   "count_pcp (mean (SD))"           "0.614"  ""    "0.015"
##   "count_spec (mean (SD))"          "<0.001" ""    "0.299"
##   "count_mh (mean (SD))"            "0.096"  ""    "0.044"
##   "count_pt (mean (SD))"            "0.768"  ""    "0.008"
##   "count_drugadmin (mean (SD))"     "<0.001" ""    "0.130"
##   "count_surg (mean (SD))"          "<0.001" ""    "0.190"
##   "count_maternity (mean (SD))"     "<0.001" ""    "0.114"
##   "count_labs (mean (SD))"          "0.007"  ""    "0.082"
##   "count_rads (mean (SD))"          "<0.001" ""    "0.231"
##   "cost_per_er (mean (SD))"         "0.103"  ""    "0.090"
##   "cost_per_hosp (mean (SD))"       "0.032"  ""    "0.231"
##   "cost_per_pcp (mean (SD))"        "<0.001" ""    "1.051"
##   "cost_per_spec (mean (SD))"       "<0.001" ""    "0.189"
##   "cost_per_mh (mean (SD))"         "0.102"  ""    "0.131"
##   "cost_per_pt (mean (SD))"         "<0.001" ""    "0.365"
##   "cost_per_drugadmin (mean (SD))"  "0.983"  ""    "0.001"
##   "cost_per_surg (mean (SD))"       "0.009"  ""    "0.136"
##   "cost_per_maternity (mean (SD))"  "0.976"  ""    "0.020"
##   "cost_per_labs (mean (SD))"       "0.052"  ""    "0.061"
##   "cost_per_rads (mean (SD))"       "0.241"  ""    "0.049"
```

```r
# post-match
postm = dta_m %>%
  mutate(count_er = 1000*count_er,
         count_hosp = 1000*count_hosp,
         count_pcp = 1000*count_pcp,
         count_spec = 1000*count_spec,
         count_mh = 1000*count_mh,
         count_pt = 1000*count_pt,
         count_drugadmin = 1000*count_drugadmin,
         count_surg = 1000*count_surg,
         count_maternity = 1000*count_maternity,
         count_labs = 1000*count_labs,
         count_rads = 1000*count_rads
  )


posttable = CreateTableOne(data =postm, vars = c("age", "female", "hcc", "mm",  "cost_m
d", "cost_rx", "cost_er" ,"cost_hosp" , "cost_pcp"  , "cost_spec"  ,"cost_mh" ,"cost_pt"
,    "cost_drugadmin","cost_surg","cost_maternity","cost_labs","cost_rads","count_er"   ,
"count_hosp" ,"count_pcp" ,"count_spec", "count_mh",   "count_pt"  , "count_drugadmin",
"count_surg","count_maternity","count_labs","count_rads", "cost_per_er", "cost_per_hosp"
, "cost_per_pcp","cost_per_spec","cost_per_mh","cost_per_pt" ,"cost_per_drugadmin","cost
_per_surg"   ,"cost_per_maternity" ,"cost_per_labs", "cost_per_rads"), strata="om_flag",
test = F)
posttab = print(posttable, smd = TRUE, contDigits=1, catDigits=1, noSpaces = TRUE, quote
= T)
```

```
##                                   "Stratified by om_flag"
##    ""                             "0"                 "1"
##    "n"                            "1584"              "1584"
##    "age (mean (SD))"             "31.1 (14.5)"       "30.6 (8.4)"
##    "female = TRUE (%)"           "262 (16.5)"        "271 (17.1)"
##    "hcc (mean (SD))"             "0.1 (0.2)"         "0.1 (0.2)"
##    "mm (mean (SD))"              "33.2 (14.3)"       "33.3 (13.7)"
##    "cost_md (mean (SD))"         "585.1 (1715.0)"    "239.6 (563.0)"
##    "cost_rx (mean (SD))"         "63.3 (546.9)"      "23.8 (158.8)"
##    "cost_er (mean (SD))"         "36.9 (131.0)"      "26.1 (141.8)"
##    "cost_hosp (mean (SD))"       "23.8 (230.1)"      "6.4 (100.7)"
##    "cost_pcp (mean (SD))"        "30.2 (60.2)"       "27.5 (33.8)"
##    "cost_spec (mean (SD))"       "12.0 (44.6)"       "2.9 (6.5)"
##    "cost_mh (mean (SD))"         "10.2 (77.1)"       "6.7 (38.5)"
##    "cost_pt (mean (SD))"         "14.2 (46.8)"       "10.8 (49.8)"
##    "cost_drugadmin (mean (SD))"  "13.8 (61.2)"       "7.5 (93.9)"
##    "cost_surg (mean (SD))"       "63.0 (396.0)"      "16.0 (90.8)"
##    "cost_maternity (mean (SD))"  "15.1 (226.9)"      "0.7 (16.9)"
##    "cost_labs (mean (SD))"       "16.6 (86.1)"       "6.8 (16.0)"
##    "cost_rads (mean (SD))"       "15.6 (64.8)"       "6.4 (36.8)"
##    "count_er (mean (SD))"        "96.4 (276.7)"      "60.1 (248.3)"
##    "count_hosp (mean (SD))"      "11.2 (57.6)"       "3.6 (36.1)"
##    "count_pcp (mean (SD))"       "227.5 (441.8)"     "166.3 (196.8)"
##    "count_spec (mean (SD))"      "101.5 (218.1)"     "22.2 (44.8)"
##    "count_mh (mean (SD))"        "40.9 (180.4)"      "40.3 (209.4)"
##    "count_pt (mean (SD))"        "372.6 (1530.6)"    "186.1 (798.5)"
##    "count_drugadmin (mean (SD))" "178.4 (562.9)"     "70.6 (157.4)"
##    "count_surg (mean (SD))"      "92.7 (230.7)"      "29.7 (99.7)"
##    "count_maternity (mean (SD))" "1.1 (12.3)"        "0.1 (1.1)"
##    "count_labs (mean (SD))"      "545.5 (1909.9)"    "316.6 (507.2)"
##    "count_rads (mean (SD))"      "79.7 (183.9)"      "35.6 (98.5)"
##    "cost_per_er (mean (SD))"     "395.0 (278.2)"     "391.9 (231.3)"
##    "cost_per_hosp (mean (SD))"   "1559.7 (3372.0)"   "3843.2 (5195.2)"
##    "cost_per_pcp (mean (SD))"    "141.7 (50.7)"      "169.6 (39.2)"
##    "cost_per_spec (mean (SD))"   "120.1 (52.8)"      "133.0 (48.5)"
##    "cost_per_mh (mean (SD))"     "141.8 (222.5)"     "132.8 (182.4)"
##    "cost_per_pt (mean (SD))"     "48.1 (31.6)"       "66.8 (48.6)"
##    "cost_per_drugadmin (mean (SD))" "55.5 (87.7)"    "64.6 (99.6)"
##    "cost_per_surg (mean (SD))"   "471.3 (1803.9)"    "295.4 (966.0)"
##    "cost_per_maternity (mean (SD))" "7354.7 (11710.7)" "3212.9 (5116.6)"
##    "cost_per_labs (mean (SD))"   "27.7 (37.2)"       "26.1 (29.2)"
##    "cost_per_rads (mean (SD))"   "141.0 (195.2)"     "118.6 (173.0)"
##                                   "Stratified by om_flag"
##    ""                             "SMD"
##    "n"                            ""
##    "age (mean (SD))"             "0.042"
##    "female = TRUE (%)"           "0.015"
##    "hcc (mean (SD))"             "0.035"
##    "mm (mean (SD))"              "0.012"
##    "cost_md (mean (SD))"         "0.271"
##    "cost_rx (mean (SD))"         "0.098"
##    "cost_er (mean (SD))"         "0.079"
##    "cost_hosp (mean (SD))"       "0.098"
```

```
##      "cost_pcp (mean (SD))"                 "0.055"
##      "cost_spec (mean (SD))"                "0.288"
##      "cost_mh (mean (SD))"                  "0.058"
##      "cost_pt (mean (SD))"                  "0.070"
##      "cost_drugadmin (mean (SD))"           "0.079"
##      "cost_surg (mean (SD))"                "0.164"
##      "cost_maternity (mean (SD))"           "0.090"
##      "cost_labs (mean (SD))"                "0.158"
##      "cost_rads (mean (SD))"                "0.175"
##      "count_er (mean (SD))"                 "0.138"
##      "count_hosp (mean (SD))"               "0.158"
##      "count_pcp (mean (SD))"                "0.179"
##      "count_spec (mean (SD))"               "0.504"
##      "count_mh (mean (SD))"                 "0.003"
##      "count_pt (mean (SD))"                 "0.153"
##      "count_drugadmin (mean (SD))"          "0.261"
##      "count_surg (mean (SD))"               "0.354"
##      "count_maternity (mean (SD))"          "0.121"
##      "count_labs (mean (SD))"               "0.164"
##      "count_rads (mean (SD))"               "0.299"
##      "cost_per_er (mean (SD))"              "0.012"
##      "cost_per_hosp (mean (SD))"            "0.521"
##      "cost_per_pcp (mean (SD))"             "0.614"
##      "cost_per_spec (mean (SD))"            "0.254"
##      "cost_per_mh (mean (SD))"              "0.044"
##      "cost_per_pt (mean (SD))"              "0.457"
##      "cost_per_drugadmin (mean (SD))"       "0.097"
##      "cost_per_surg (mean (SD))"            "0.122"
##      "cost_per_maternity (mean (SD))"       "0.458"
##      "cost_per_labs (mean (SD))"            "0.048"
##      "cost_per_rads (mean (SD))"            "0.121"
```

# Treatment effect

```
glmMatched1 <- glm(formula = logcost_md ~ om_flag + age + female + mm + hcc + ccs + zip
,
                   data    = dta_run)

glmMatched2 <- glm(formula = logcost_er ~ om_flag + age + female + mm + hcc + ccs + zip
,
                   data    = dta_run)

glmMatched3 <- glm(formula = logcost_hosp ~ om_flag + age + female + mm + hcc + ccs + zi
p ,
                   data    = dta_run)

glmMatched4 <- glm(formula = logcost_pcp ~ om_flag + age + female + mm + hcc + ccs + zip
,
                   data    = dta_run)

glmMatched5 <- glm(formula = logcost_spec ~ om_flag + age + female + mm + hcc + ccs + zi
p ,
                   data    = dta_run)


glmMatched5a <- glm(formula = logcost_mh ~ om_flag + age + female + mm + hcc + ccs+ zip
,
                    data    = dta_run)


glmMatched5b <- glm(formula = logcost_pt ~ om_flag + age + female + mm + hcc + ccs + zip
,
                    data    = dta_run)


glmMatched6 <- glm(formula = logcost_rx ~ om_flag + age + female + mm + hcc + ccs + zip
,
                   data    = dta_run)


glmMatched6a <- glm(formula = logcost_drugadmin ~ om_flag + age + female + mm + hcc + cc
s + zip ,
                    data    = dta_run)
glmMatched6b <- glm(formula = logcost_surg ~ om_flag + age + female + mm + hcc + ccs+ zi
p  ,
                    data    = dta_run)
glmMatched6c <- glm(formula = logcost_maternity ~ om_flag + age + female + mm + hcc + cc
s+ zip  ,
                    data    = dta_run)
glmMatched6d <- glm(formula = logcost_labs ~ om_flag + age + female + mm + hcc + ccs + z
ip ,
                    data    = dta_run)
glmMatched6e <- glm(formula = logcost_rads ~ om_flag + age + female + mm + hcc + ccs + z
ip ,
                    data    = dta_run)
```

```
glmMatched7 <- glm(formula = logcount_er ~ om_flag + age + female + mm + hcc + ccs + zip
,
                   data     = dta_run)


glmMatched8 <- glm(formula = logcount_hosp ~ om_flag + age + female + mm + hcc + ccs + z
ip ,
                   data     = dta_run)


glmMatched9 <- glm(formula = logcount_pcp ~ om_flag + age + female + mm + hcc + ccs + zi
p ,
                   data     = dta_run)

glmMatched10 <- glm(formula = logcount_spec ~ om_flag + age + female + mm + hcc + ccs+ z
ip   ,
                    data     = dta_run)




glmMatched10a <- glm(formula = logcount_mh ~ om_flag + age + female + mm + hcc + ccs + z
ip ,
                     data     = dta_run)




glmMatched10b <- glm(formula = logcount_pt ~ om_flag + age + female + mm + hcc + ccs+ zi
p   ,
                     data     = dta_run)




glmMatched10c <- glm(formula = logcount_drugadmin ~ om_flag + age + female + mm + hcc +
ccs + zip ,
                     data     = dta_run)
glmMatched10d <- glm(formula = logcount_surg ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                     data     = dta_run)
glmMatched10e <- glm(formula = logcount_maternity ~ om_flag + age + female + mm + hcc +
ccs + zip ,
                     data     = dta_run)
glmMatched10f <- glm(formula = logcount_labs ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                     data     = dta_run)
glmMatched10g <- glm(formula = logcount_rads ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                     data     = dta_run)




glmMatched11 <- glm(formula = logcost_per_er ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                    data     = dta_run)


glmMatched11b <- glm(formula = logcost_per_hosp ~ om_flag + age + female + mm + hcc + cc
s+ zip   ,
```

```
                       data      = dta_run)


glmMatched11c <- glm(formula = logcost_per_pcp ~ om_flag + age + female + mm + hcc + ccs
+ zip ,

                     data      = dta_run)



glmMatched5c <- glm(formula = logcost_per_spec ~ om_flag + age + female + mm + hcc + ccs
+ zip ,

                    data      = dta_run)



glmMatched5ca <- glm(formula = logcost_per_mh ~ om_flag + age + female + mm + hcc + ccs
+ zip ,

                     data      = dta_run)



glmMatched5cb <- glm(formula = logcost_per_pt ~ om_flag + age + female + mm + hcc + ccs
+ zip ,

                     data      = dta_run)



glmMatched5cc <- glm(formula = logcost_per_drugadmin ~ om_flag + age + female + mm + hcc
+ ccs + zip ,

                     data      = dta_run)

glmMatched5cd <- glm(formula = logcost_per_surg ~ om_flag + age + female + mm + hcc + cc
s + zip ,

                     data      = dta_run)

glmMatched5ce <- glm(formula = logcost_per_maternity ~ om_flag + age + female + mm + hcc
+ ccs + zip ,

                     data      = dta_run)

glmMatched5cf <- glm(formula = logcost_per_labs ~ om_flag + age + female + mm + hcc + cc
s+ zip  ,

                     data      = dta_run)

glmMatched5cg <- glm(formula = logcost_per_rads ~ om_flag + age + female + mm + hcc + cc
s + zip ,

                     data      = dta_run)
```

# Results as percentage change in each outcome

```r
exponentiate <- function(x) ((exp(x)-1)*100)

stargazer::stargazer(glmMatched1, glmMatched2, glmMatched3, glmMatched4, glmMatched5, gl
mMatched5a, glmMatched5b, glmMatched6,glmMatched6a,glmMatched6b,glmMatched6c,glmMatched6
d,glmMatched6e,
          title="Spending",
          type = "html",
          keep=c("om_flag","age","female","mm","hcc"),
          ci=TRUE, ci.level=0.95,
          apply.coef=exponentiate, apply.se = exponentiate,
          digits = 1,
          star.cutoffs = c(0.05, 0.01, 0.001),
          column.labels = c("Total Spend", "Emergency", "Hospital", "Primary Care", "Spe
cialist", "Mental Health", "Physical Therapy", "Rx", "Drug admin", "Surgery", "Maternit
y", "Labs", "Radiology"),
          out = "table1.htm")
```

```
## 
## <table style="text-align:center"><caption><strong>Spending</strong></caption>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"></td><td colspan="13"><em>Dependent variable:</em></td></tr>
## <tr><td></td><td colspan="13" style="border-bottom: 1px solid black"></td></tr>
## <tr><td style="text-align:left"></td><td>logcost_md</td><td>logcost_er</td><td>logcos
t_hosp</td><td>logcost_pcp</td><td>logcost_spec</td><td>logcost_mh</td><td>logcost_pt</t
d><td>logcost_rx</td><td>logcost_drugadmin</td><td>logcost_surg</td><td>logcost_maternit
y</td><td>logcost_labs</td><td>logcost_rads</td></tr>
## <tr><td style="text-align:left"></td><td>Total Spend</td><td>Emergency</td><td>Hospit
al</td><td>Primary Care</td><td>Specialist</td><td>Mental Health</td><td>Physical Therap
y</td><td>Rx</td><td>Drug admin</td><td>Surgery</td><td>Maternity</td><td>Labs</td><td>R
adiology</td></tr>
## <tr><td style="text-align:left"></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td>
<td>(5)</td><td>(6)</td><td>(7)</td><td>(8)</td><td>(9)</td><td>(10)</td><td>(11)</td><t
d>(12)</td><td>(13)</td></tr>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">om_flag</td><td>-26.8<sup>***</sup></td><td>-35.1<sup>***</sup></td><
td>-16.1<sup>***</sup></td><td>48.3<sup>***</sup></td><td>-57.5<sup>***</sup></td><td>3.
8</td><td>2.4</td><td>-33.8<sup>***</sup></td><td>-29.3<sup>***</sup></td><td>-48.6<sup>
***</sup></td><td>-11.7<sup>***</sup></td><td>-30.1<sup>***</sup></td><td>-39.5<sup>***
</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-36.5, -17.0)</td><td>(-47.2, -23.1)</td><t
d>(-22.4, -9.7)</td><td>(40.8, 55.8)</td><td>(-65.9, -49.2)</td><td>(-3.6, 11.2)</td><td
>(-6.7, 11.4)</td><td>(-44.9, -22.6)</td><td>(-38.1, -20.5)</td><td>(-60.0, -37.2)</td><
td>(-16.1, -7.3)</td><td>(-38.7, -21.6)</td><td>(-48.4, -30.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">age</td><td>-0.5<sup>*</sup></td><td>-1.2<sup>***</su
p></td><td>-0.6<sup>***</sup></td><td>-0.5<sup>**</sup></td><td>0.8<sup>***</sup></td><t
d>-0.5<sup>**</sup></td><td>0.7<sup>***</sup></td><td>1.2<sup>***</sup></td><td>-2.2<sup
>***</sup></td><td>1.2<sup>***</sup></td><td>-0.6<sup>***</sup></td><td>1.8<sup>***</sup
></td><td>1.2<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-1.0, -0.1)</td><td>(-1.8, -0.7)</td><td>(-
0.9, -0.3)</td><td>(-0.8, -0.1)</td><td>(0.4, 1.2)</td><td>(-0.8, -0.2)</td><td>(0.3, 1.
2)</td><td>(0.7, 1.7)</td><td>(-2.6, -1.8)</td><td>(0.7, 1.8)</td><td>(-0.8, -0.4)</td><
td>(1.4, 2.2)</td><td>(0.8, 1.6)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">female</td><td>3.7</td><td>-16.6</td><td>-3.4</td><td
>6.3</td><td>-3.9</td><td>-8.9</td><td>-16.2<sup>*</sup></td><td>108.8<sup>***</sup></td
><td>9.1</td><td>6.6</td><td>22.2<sup>***</sup></td><td>7.6</td><td>20.3<sup>**</sup></t
d></tr>
## <tr><td style="text-align:left"></td><td>(-10.9, 18.2)</td><td>(-34.6, 1.4)</td><td>
(-12.9, 6.0)</td><td>(-4.8, 17.5)</td><td>(-16.3, 8.6)</td><td>(-19.9, 2.1)</td><td>(-2
9.7, -2.8)</td><td>(92.2, 125.5)</td><td>(-4.0, 22.3)</td><td>(-10.4, 23.7)</td><td>(15.
8, 28.7)</td><td>(-5.1, 20.4)</td><td>(7.0, 33.6)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">mm</td><td>-1.5<sup>***</sup></td><td>0.2</td><td>-0.
3<sup>*</sup></td><td>-1.9<sup>***</sup></td><td>0.5<sup>**</sup></td><td>0.01</td><td>-
0.2</td><td>-0.02</td><td>-0.002</td><td>0.9<sup>***</sup></td><td>0.04</td><td>-0.9<sup
>***</sup></td><td>0.1</td></tr>
```

```
## <tr><td style="text-align:left"></td><td>(-1.9, -1.1)</td><td>(-0.2, 0.7)</td><td>(-
0.5, -0.1)</td><td>(-2.2, -1.6)</td><td>(0.2, 0.8)</td><td>(-0.3, 0.3)</td><td>(-0.6, 0.
1)</td><td>(-0.5, 0.4)</td><td>(-0.3, 0.3)</td><td>(0.5, 1.3)</td><td>(-0.1, 0.2)</td><t
d>(-1.2, -0.5)</td><td>(-0.2, 0.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">hcc</td><td>649.9<sup>***</sup></td><td>311.9<sup>***
</sup></td><td>184.8<sup>***</sup></td><td>290.5<sup>***</sup></td><td>214.4<sup>***</su
p></td><td>357.1<sup>***</sup></td><td>185.8<sup>***</sup></td><td>526.4<sup>***</sup></
td><td>114.0<sup>***</sup></td><td>482.8<sup>***</sup></td><td>7.9</td><td>268.2<sup>***
</sup></td><td>258.9<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(619.7, 680.1)</td><td>(274.2, 349.7)</td><t
d>(165.4, 204.2)</td><td>(267.5, 313.5)</td><td>(188.7, 240.1)</td><td>(334.4, 379.7)</t
d><td>(157.9, 213.7)</td><td>(491.6, 561.2)</td><td>(86.8, 141.2)</td><td>(447.1, 518.4)
</td><td>(-5.3, 21.1)</td><td>(241.9, 294.6)</td><td>(231.3, 286.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">Observations</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168
</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168</td
><td>3,168</td><td>3,168</td><td>3,168</td></tr>
## <tr><td style="text-align:left">Log Likelihood</td><td>-5,119.3</td><td>-5,773.7</td>
<td>-3,794.9</td><td>-4,304.1</td><td>-4,642.4</td><td>-4,268.7</td><td>-4,885.0</td><td
>-5,535.0</td><td>-4,813.4</td><td>-5,604.7</td><td>-2,623.1</td><td>-4,715.8</td><td>-
4,851.1</td></tr>
## <tr><td style="text-align:left">Akaike Inf. Crit.</td><td>11,196.6</td><td>12,505.3</
td><td>8,547.7</td><td>9,566.1</td><td>10,242.8</td><td>9,495.4</td><td>10,728.1</td><td
>12,028.0</td><td>10,584.8</td><td>12,167.3</td><td>6,204.3</td><td>10,389.6</td><td>10,
660.2</td></tr>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"><em>Note:</em></td><td colspan="13" style="text-align:right"><sup>*</
sup>p<0.05; <sup>**</sup>p<0.01; <sup>***</sup>p<0.001</td></tr>
## </table>
```

```
stargazer::stargazer(glmMatched7, glmMatched8, glmMatched9, glmMatched10, glmMatched10a,
glmMatched10b,glmMatched10c,glmMatched10d,glmMatched10e,glmMatched10f,glmMatched10g,
        title="Utilization",
        type = "html",
        keep=c("om_flag","age","female","mm","hcc"),
        ci=TRUE, ci.level=0.95,
        apply.coef=exponentiate,apply.se = exponentiate,
        digits = 1,
        star.cutoffs = c(0.05, 0.01, 0.001),
        column.labels = c("Emergency", "Hospital", "Primary Care", "Specialist", "Ment
al Health", "Physical Therapy", "Drug admin", "Surgery", "Maternity", "Labs", "Radiolog
y"),
        out = "table2.htm")
```

```
## 
## <table style="text-align:center"><caption><strong>Utilization</strong></caption>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"></td><td colspan="11"><em>Dependent variable:</em></td></tr>
## <tr><td></td><td colspan="11" style="border-bottom: 1px solid black"></td></tr>
## <tr><td style="text-align:left"></td><td>logcount_er</td><td>logcount_hosp</td><td>lo
gcount_pcp</td><td>logcount_spec</td><td>logcount_mh</td><td>logcount_pt</td><td>logcoun
t_drugadmin</td><td>logcount_surg</td><td>logcount_maternity</td><td>logcount_labs</td><
td>logcount_rads</td></tr>
## <tr><td style="text-align:left"></td><td>Emergency</td><td>Hospital</td><td>Primary C
are</td><td>Specialist</td><td>Mental Health</td><td>Physical Therapy</td><td>Drug admin
</td><td>Surgery</td><td>Maternity</td><td>Labs</td><td>Radiology</td></tr>
## <tr><td style="text-align:left"></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td>
<td>(5)</td><td>(6)</td><td>(7)</td><td>(8)</td><td>(9)</td><td>(10)</td><td>(11)</td></
tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">om_flag</td><td>-2.4<sup>***</sup></td><td>-0.6<sup>***</sup></td><td
>-2.5<sup>***</sup></td><td>-5.8<sup>***</sup></td><td>-0.1</td><td>-4.2<sup>***</sup></
td><td>-6.6<sup>***</sup></td><td>-4.4<sup>***</sup></td><td>-0.1<sup>***</sup></td><td>
-7.0<sup>***</sup></td><td>-3.2<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-3.4, -1.4)</td><td>(-0.9, -0.3)</td><td>(-
3.6, -1.3)</td><td>(-6.5, -5.2)</td><td>(-0.8, 0.6)</td><td>(-6.3, -2.2)</td><td>(-7.8,
-5.5)</td><td>(-5.2, -3.6)</td><td>(-0.1, -0.1)</td><td>(-9.0, -4.9)</td><td>(-3.8, -2.
5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">age</td><td>-0.04</td><td>-0.03<sup>***</sup></td><td
>-0.05</td><td>0.1<sup>***</sup></td><td>-0.02</td><td>0.2<sup>***</sup></td><td>-0.3<su
p>***</sup></td><td>0.1<sup>***</sup></td><td>-0.01<sup>***</sup></td><td>0.5<sup>***</s
up></td><td>0.1<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-0.1, 0.01)</td><td>(-0.04, -0.01)</td><td>
(-0.1, 0.01)</td><td>(0.04, 0.1)</td><td>(-0.1, 0.02)</td><td>(0.1, 0.3)</td><td>(-0.3,
-0.2)</td><td>(0.1, 0.2)</td><td>(-0.01, -0.004)</td><td>(0.4, 0.6)</td><td>(0.04, 0.1)
</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">female</td><td>-1.8<sup>*</sup></td><td>-0.3</td><td>
0.3</td><td>-0.6</td><td>-0.7</td><td>-2.8</td><td>-1.3</td><td>0.9</td><td>0.1<sup>**</
sup></td><td>6.2<sup>***</sup></td><td>1.1<sup>*</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-3.3, -0.3)</td><td>(-0.7, 0.1)</td><td>(-
1.4, 2.0)</td><td>(-1.6, 0.3)</td><td>(-1.7, 0.4)</td><td>(-5.8, 0.3)</td><td>(-3.0, 0.
4)</td><td>(-0.3, 2.1)</td><td>(0.03, 0.1)</td><td>(3.2, 9.2)</td><td>(0.1, 2.1)</td></t
r>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">mm</td><td>-0.1<sup>***</sup></td><td>-0.02<sup>***</
sup></td><td>-0.4<sup>***</sup></td><td>-0.1<sup>***</sup></td><td>-0.04<sup>**</sup></t
d><td>-0.2<sup>***</sup></td><td>-0.2<sup>***</sup></td><td>-0.04<sup>*</sup></td><td>-
0.001</td><td>-0.6<sup>***</sup></td><td>-0.1<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-0.2, -0.1)</td><td>(-0.03, -0.01)</td><td>
(-0.5, -0.4)</td><td>(-0.1, -0.03)</td><td>(-0.1, -0.01)</td><td>(-0.3, -0.1)</td><td>(-
0.3, -0.2)</td><td>(-0.1, -0.01)</td><td>(-0.002, 0.000)</td><td>(-0.6, -0.5)</td><td>(-
0.1, -0.1)</td></tr>
```

```
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">hcc</td><td>10.8<sup>***</sup></td><td>3.3<sup>***</s
up></td><td>20.8<sup>***</sup></td><td>6.3<sup>***</sup></td><td>9.1<sup>***</sup></td><
td>20.6<sup>***</sup></td><td>8.5<sup>***</sup></td><td>9.1<sup>***</sup></td><td>0.05</
td><td>39.3<sup>***</sup></td><td>9.6<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(7.8, 13.8)</td><td>(2.5, 4.1)</td><td>(17.
5, 24.2)</td><td>(4.4, 8.3)</td><td>(7.0, 11.2)</td><td>(14.5, 26.8)</td><td>(5.1, 12.0)
</td><td>(6.7, 11.5)</td><td>(-0.05, 0.1)</td><td>(33.3, 45.4)</td><td>(7.6, 11.6)</td>
</tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">Observations</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168
</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168</td
><td>3,168</td></tr>
## <tr><td style="text-align:left">Log Likelihood</td><td>2,004.7</td><td>6,240.5</td><t
d>1,633.8</td><td>3,371.4</td><td>3,101.0</td><td>-264.9</td><td>1,554.0</td><td>2,674.3
</td><td>12,927.3</td><td>-213.9</td><td>3,280.1</td></tr>
## <tr><td style="text-align:left">Akaike Inf. Crit.</td><td>-3,051.3</td><td>-11,523.1
</td><td>-2,309.5</td><td>-5,784.8</td><td>-5,244.1</td><td>1,487.9</td><td>-2,150.0</td
><td>-4,390.6</td><td>-24,896.7</td><td>1,385.9</td><td>-5,602.1</td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"><em>Note:</em></td><td colspan="11" style="text-align:right"><sup>*</
sup>p<0.05; <sup>**</sup>p<0.01; <sup>***</sup>p<0.001</td></tr>
## </table>
```

```
stargazer::stargazer(glmMatched11, glmMatched11b, glmMatched11c, glmMatched5c, glmMatche
d5ca, glmMatched5cb, glmMatched5cc, glmMatched5cd, glmMatched5ce, glmMatched5cf, gl
mMatched5cg,
        title="Cost per Utilization",
        type = "html",
        keep=c("om_flag","age","female","mm","hcc"),
        ci=TRUE, ci.level=0.95,
        apply.coef=exponentiate,apply.se = exponentiate,
        digits = 1,
        star.cutoffs = c(0.05, 0.01, 0.001),
        column.labels = c("Emergency", "Hospital", "Primary Care", "Specialist", "Ment
al Health", "Physical Therapy", "Drug admin", "Surgery", "Maternity", "Labs", "Radiolog
y"),
        out = "table3.htm")
```

```
## 
## <table style="text-align:center"><caption><strong>Cost per Utilization</strong></capt
ion>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"></td><td colspan="11"><em>Dependent variable:</em></td></tr>
## <tr><td></td><td colspan="11" style="border-bottom: 1px solid black"></td></tr>
## <tr><td style="text-align:left"></td><td>logcost_per_er</td><td>logcost_per_hosp</td>
<td>logcost_per_pcp</td><td>logcost_per_spec</td><td>logcost_per_mh</td><td>logcost_per_
pt</td><td>logcost_per_drugadmin</td><td>logcost_per_surg</td><td>logcost_per_maternity
</td><td>logcost_per_labs</td><td>logcost_per_rads</td></tr>
## <tr><td style="text-align:left"></td><td>Emergency</td><td>Hospital</td><td>Primary C
are</td><td>Specialist</td><td>Mental Health</td><td>Physical Therapy</td><td>Drug admin
</td><td>Surgery</td><td>Maternity</td><td>Labs</td><td>Radiology</td></tr>
## <tr><td style="text-align:left"></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td>
<td>(5)</td><td>(6)</td><td>(7)</td><td>(8)</td><td>(9)</td><td>(10)</td><td>(11)</td></
tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">om_flag</td><td>2.2</td><td>213.6<sup>***</sup></td><td>25.0<sup>***
</sup></td><td>11.8<sup>***</sup></td><td>1.0</td><td>43.1<sup>***</sup></td><td>12.2<su
p>***</sup></td><td>-19.7<sup>**</sup></td><td>-81.7<sup>***</sup></td><td>7.2<sup>**</s
up></td><td>-15.9<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-3.1, 7.4)</td><td>(198.3, 228.9)</td><td>
(22.4, 27.6)</td><td>(7.5, 16.0)</td><td>(-10.9, 12.8)</td><td>(38.0, 48.1)</td><td>(5.
0, 19.4)</td><td>(-32.4, -6.9)</td><td>(-106.3, -57.1)</td><td>(2.1, 12.3)</td><td>(-24.
2, -7.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">age</td><td>-0.3<sup>*</sup></td><td>0.04</td><td>0.1
</td><td>-0.1</td><td>0.6<sup>*</sup></td><td>-0.1</td><td>-1.2<sup>***</sup></td><td>0.
1</td><td>-1.6<sup>**</sup></td><td>1.1<sup>***</sup></td><td>1.8<sup>***</sup></td></tr
>
## <tr><td style="text-align:left"></td><td>(-0.6, -0.1)</td><td>(-0.7, 0.7)</td><td>(-
0.05, 0.2)</td><td>(-0.3, 0.1)</td><td>(0.1, 1.2)</td><td>(-0.4, 0.1)</td><td>(-1.5, -0.
9)</td><td>(-0.5, 0.7)</td><td>(-2.7, -0.4)</td><td>(0.9, 1.4)</td><td>(1.5, 2.2)</td></
tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">female</td><td>-10.4<sup>**</sup></td><td>-16.3</td><
td>-7.4<sup>***</sup></td><td>1.8</td><td>-10.6</td><td>-6.5</td><td>38.3<sup>***</sup>
</td><td>-5.4</td><td>11.9</td><td>-3.8</td><td>5.1</td></tr>
## <tr><td style="text-align:left"></td><td>(-18.3, -2.6)</td><td>(-39.3, 6.7)</td><td>
(-11.2, -3.6)</td><td>(-4.5, 8.1)</td><td>(-28.4, 7.1)</td><td>(-14.0, 1.0)</td><td>(27.
6, 49.0)</td><td>(-24.6, 13.7)</td><td>(-25.4, 49.3)</td><td>(-11.4, 3.9)</td><td>(-7.4,
17.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">mm</td><td>0.5<sup>***</sup></td><td>-0.7<sup>*</sup>
</td><td>-0.1</td><td>-0.1</td><td>-0.1</td><td>-0.004</td><td>0.2</td><td>-0.8<sup>**</
sup></td><td>4.1<sup>***</sup></td><td>0.05</td><td>-0.1</td></tr>
## <tr><td style="text-align:left"></td><td>(0.3, 0.7)</td><td>(-1.3, -0.1)</td><td>(-0.
2, 0.003)</td><td>(-0.3, 0.03)</td><td>(-0.5, 0.4)</td><td>(-0.2, 0.2)</td><td>(-0.1, 0.
5)</td><td>(-1.2, -0.3)</td><td>(3.2, 5.1)</td><td>(-0.2, 0.2)</td><td>(-0.4, 0.2)</td>
</tr>
```

```
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">hcc</td><td>-2.3</td><td>117.5<sup>***</sup></td><td>
0.4</td><td>6.0</td><td>92.0<sup>***</sup></td><td>14.9</td><td>17.6</td><td>54.2<sup>**
</sup></td><td>-39.5</td><td>21.4<sup>**</sup></td><td>28.7<sup>*</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-18.3, 13.7)</td><td>(68.9, 166.2)</td><td>
(-7.4, 8.1)</td><td>(-6.8, 18.9)</td><td>(54.8, 129.1)</td><td>(-0.4, 30.3)</td><td>(-4.
4, 39.6)</td><td>(13.9, 94.4)</td><td>(-121.5, 42.4)</td><td>(5.8, 36.9)</td><td>(3.0, 5
4.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">Observations</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168
</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168</td><td>3,168</td
><td>3,168</td></tr>
## <tr><td style="text-align:left">Log Likelihood</td><td>-3,211.4</td><td>-6,502.9</td>
<td>-971.6</td><td>-2,536.9</td><td>-5,724.5</td><td>-3,084.0</td><td>-4,181.3</td><td>-
5,955.8</td><td>-7,941.4</td><td>-3,121.0</td><td>-4,647.7</td></tr>
## <tr><td style="text-align:left">Akaike Inf. Crit.</td><td>7,380.7</td><td>13,963.8</t
d><td>2,901.2</td><td>6,031.8</td><td>12,407.0</td><td>7,125.9</td><td>9,320.6</td><td>1
2,869.5</td><td>16,840.8</td><td>7,200.0</td><td>10,253.4</td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"><em>Note:</em></td><td colspan="11" style="text-align:right"><sup>*</
sup>p<0.05; <sup>**</sup>p<0.01; <sup>***</sup>p<0.001</td></tr>
## </table>
```

```
evalues.OLS(est = glmMatched1$coefficients[2],
se = summary(glmMatched1)$coefficients['om_flag','Std. Error'],
sd = sd(dta_run$logcost_md) )
```

```
##                 point      lower     upper
## RR         0.8269299 0.7804072 0.876226
## E-values 1.7123785         NA 1.542770
```

# Sensitivity analyses:

- exclude NICU and newborns, dialysis, pregnancy, hospice, rehab, and transplants
- cap claimants to $50k/12mo
- exclude those without a min # of member-months: 12

```
sens_m = dta_run %>%
  filter(age != 0,
         diag1 != "Z992",
         diag1 != "Z340",
         diag1 != "Z515",
         diag1 != "F0",
         diag1 != "T86",
         (cost_md/mm) < (50000/12),
         mm>12)
```

# Sensitivity results

```
glmMatched1_s <- glm(formula = logcost_md ~ om_flag + age + female + mm + hcc + ccs +zip
,
                data    = sens_m)

glmMatched2_s <- glm(formula = logcost_er ~ om_flag + age + female + mm + hcc + ccs +zip
,
                data    = sens_m)

glmMatched3_s <- glm(formula = logcost_hosp ~ om_flag + age + female + mm + hcc + ccs +z
ip ,
                data    = sens_m)

glmMatched4_s <- glm(formula = logcost_pcp ~ om_flag + age + female + mm + hcc + ccs +zi
p ,
                data     = sens_m)

glmMatched5_s <- glm(formula = logcost_spec ~ om_flag + age + female + mm + hcc + ccs +z
ip ,
                data     = sens_m)


glmMatched5a_s <- glm(formula = logcost_mh ~ om_flag + age + female + mm + hcc + ccs +zi
p ,
                 data     = sens_m)


glmMatched5b_s <- glm(formula = logcost_pt ~ om_flag + age + female + mm + hcc + ccs +zi
p ,
                 data     = sens_m)


glmMatched6_s <- glm(formula = logcost_rx ~ om_flag + age + female + mm + hcc + ccs +zip
,
                 data     = sens_m)


glmMatched6a_s <- glm(formula = logcost_drugadmin ~ om_flag + age + female + mm + hcc +
ccs +zip ,
                  data     = sens_m)
glmMatched6b_s <- glm(formula = logcost_surg ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                  data     = sens_m)
glmMatched6c_s <- glm(formula = logcost_maternity ~ om_flag + age + female + mm + hcc +
ccs +zip ,
                  data     = sens_m)
glmMatched6d_s <- glm(formula = logcost_labs ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                  data     = sens_m)
glmMatched6e_s <- glm(formula = logcost_rads ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                  data     = sens_m)
```

```
glmMatched7_s <- glm(formula = logcount_er ~ om_flag + age + female + mm + hcc + ccs +zi
p ,
                     data    = sens_m)



glmMatched8_s <- glm(formula = logcount_hosp ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                     data     = sens_m)



glmMatched9_s <- glm(formula = logcount_pcp ~ om_flag + age + female + mm + hcc + ccs +z
ip ,
                     data     = sens_m)

glmMatched10_s <- glm(formula = logcount_spec ~ om_flag + age + female + mm + hcc + ccs
+zip ,
                      data     = sens_m)




glmMatched10a_s <- glm(formula = logcount_mh ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                       data     = sens_m)




glmMatched10b_s <- glm(formula = logcount_pt ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                       data     = sens_m)



glmMatched10c_s <- glm(formula = logcount_drugadmin ~ om_flag + age + female + mm + hcc
+ ccs+zip  ,
                       data     = sens_m)
glmMatched10d_s <- glm(formula = logcount_surg ~ om_flag + age + female + mm + hcc + ccs
+zip ,
                       data     = sens_m)
glmMatched10e_s <- glm(formula = logcount_maternity ~ om_flag + age + female + mm + hcc
+ ccs+zip  ,
                       data     = sens_m)
glmMatched10f_s <- glm(formula = logcount_labs ~ om_flag + age + female + mm + hcc + ccs
+zip  ,
                       data     = sens_m)
glmMatched10g_s <- glm(formula = logcount_rads ~ om_flag + age + female + mm + hcc + ccs
+zip ,
                       data     = sens_m)



glmMatched11_s <- glm(formula = logcost_per_er ~ om_flag + age + female + mm + hcc + ccs
+zip ,
                      data     = sens_m)

glmMatched11b_s <- glm(formula = logcost_per_hosp ~ om_flag + age + female + mm + hcc +
ccs +zip ,
```

```
                         data    = sens_m)


glmMatched11c_s <- glm(formula = logcost_per_pcp ~ om_flag + age + female + mm + hcc + c
cs+zip  ,
                       data    = sens_m)



glmMatched5c_s <- glm(formula = logcost_per_spec ~ om_flag + age + female + mm + hcc + c
cs+zip  ,
                       data    = sens_m)



glmMatched5ca_s <- glm(formula = logcost_per_mh ~ om_flag + age + female + mm + hcc + cc
s+zip  ,
                       data    = sens_m)



glmMatched5cb_s <- glm(formula = logcost_per_pt ~ om_flag + age + female + mm + hcc + cc
s +zip ,
                       data    = sens_m)



glmMatched5cc_s <- glm(formula = logcost_per_drugadmin ~ om_flag + age + female + mm + h
cc + ccs +zip ,
                       data    = sens_m)

glmMatched5cd_s <- glm(formula = logcost_per_surg ~ om_flag + age + female + mm + hcc +
ccs +zip ,
                       data    = sens_m)

glmMatched5ce_s <- glm(formula = logcost_per_maternity ~ om_flag + age + female + mm + h
cc + ccs +zip ,
                       data    = sens_m)

glmMatched5cf_s <- glm(formula = logcost_per_labs ~ om_flag + age + female + mm + hcc +
ccs +zip ,
                       data    = sens_m)

glmMatched5cg_s <- glm(formula = logcost_per_rads ~ om_flag + age + female + mm + hcc +
ccs +zip ,
                       data    = sens_m)
```

# Sens table results

```
exponentiate_s <- function(x) ((exp(x)-1)*100)


stargazer::stargazer(glmMatched1_s, glmMatched2_s, glmMatched3_s, glmMatched4_s, glmMatc
hed5_s, glmMatched5a_s, glmMatched5b_s, glmMatched6_s,glmMatched6a_s,glmMatched6b_s,glmM
atched6c_s,glmMatched6d_s,glmMatched6e_s,
         title="Spending",
         type = "html",
         keep=c("om_flag","age","female","mm","hcc"),
         ci=TRUE, ci.level=0.95,
         apply.coef=exponentiate, apply.se = exponentiate,
         digits = 1,
         star.cutoffs = c(0.05, 0.01, 0.001),
         column.labels = c("Total Spend", "Emergency", "Hospital", "Primary Care", "Spe
cialist", "Mental Health", "Physical Therapy", "Rx", "Drug admin", "Surgery", "Maternit
y", "Labs", "Radiology"),
         out = "table1s.htm")
```

```
## 
## <table style="text-align:center"><caption><strong>Spending</strong></caption>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"></td><td colspan="13"><em>Dependent variable:</em></td></tr>
## <tr><td></td><td colspan="13" style="border-bottom: 1px solid black"></td></tr>
## <tr><td style="text-align:left"></td><td>logcost_md</td><td>logcost_er</td><td>logcos
t_hosp</td><td>logcost_pcp</td><td>logcost_spec</td><td>logcost_mh</td><td>logcost_pt</t
d><td>logcost_rx</td><td>logcost_drugadmin</td><td>logcost_surg</td><td>logcost_maternit
y</td><td>logcost_labs</td><td>logcost_rads</td></tr>
## <tr><td style="text-align:left"></td><td>Total Spend</td><td>Emergency</td><td>Hospit
al</td><td>Primary Care</td><td>Specialist</td><td>Mental Health</td><td>Physical Therap
y</td><td>Rx</td><td>Drug admin</td><td>Surgery</td><td>Maternity</td><td>Labs</td><td>R
adiology</td></tr>
## <tr><td style="text-align:left"></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td>
<td>(5)</td><td>(6)</td><td>(7)</td><td>(8)</td><td>(9)</td><td>(10)</td><td>(11)</td><t
d>(12)</td><td>(13)</td></tr>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">om_flag</td><td>-28.6<sup>***</sup></td><td>-39.7<sup>***</sup></td><
td>-17.3<sup>***</sup></td><td>39.1<sup>***</sup></td><td>-58.8<sup>***</sup></td><td>1.
5</td><td>-0.5</td><td>-35.3<sup>***</sup></td><td>-28.9<sup>***</sup></td><td>-50.5<sup
>***</sup></td><td>-12.7<sup>***</sup></td><td>-30.0<sup>***</sup></td><td>-39.0<sup>***
</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-38.8, -18.5)</td><td>(-52.2, -27.2)</td><t
d>(-23.8, -10.8)</td><td>(31.5, 46.6)</td><td>(-67.4, -50.3)</td><td>(-6.1, 9.2)</td><td
>(-10.1, 9.1)</td><td>(-47.1, -23.6)</td><td>(-38.1, -19.7)</td><td>(-62.6, -38.4)</td><
td>(-17.4, -8.1)</td><td>(-38.7, -21.3)</td><td>(-48.2, -29.8)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">age</td><td>-0.6<sup>*</sup></td><td>-1.2<sup>***</su
p></td><td>-0.7<sup>***</sup></td><td>-0.4<sup>*</sup></td><td>0.7<sup>***</sup></td><td
>-0.4<sup>*</sup></td><td>0.9<sup>***</sup></td><td>0.8<sup>**</sup></td><td>-2.0<sup>**
*</sup></td><td>1.4<sup>***</sup></td><td>-0.5<sup>***</sup></td><td>1.7<sup>***</sup></
td><td>1.1<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-1.1, -0.1)</td><td>(-1.8, -0.6)</td><td>(-
1.0, -0.3)</td><td>(-0.8, -0.1)</td><td>(0.3, 1.1)</td><td>(-0.7, -0.02)</td><td>(0.5,
1.4)</td><td>(0.3, 1.4)</td><td>(-2.5, -1.6)</td><td>(0.8, 2.0)</td><td>(-0.7, -0.3)</td
><td>(1.3, 2.1)</td><td>(0.6, 1.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">female</td><td>13.2</td><td>-10.4</td><td>-3.0</td><t
d>8.7</td><td>-2.8</td><td>-6.1</td><td>-14.8<sup>*</sup></td><td>120.9<sup>***</sup></t
d><td>11.1</td><td>10.5</td><td>28.7<sup>***</sup></td><td>18.8<sup>**</sup></td><td>22.
3<sup>**</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-2.2, 28.6)</td><td>(-29.4, 8.5)</td><td>(-
12.8, 6.8)</td><td>(-2.6, 20.1)</td><td>(-15.8, 10.1)</td><td>(-17.6, 5.5)</td><td>(-29.
3, -0.3)</td><td>(103.0, 138.7)</td><td>(-2.8, 25.0)</td><td>(-7.9, 28.9)</td><td>(21.6,
35.7)</td><td>(5.7, 31.9)</td><td>(8.4, 36.1)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">mm</td><td>-0.6<sup>**</sup></td><td>0.4</td><td>-0.3
</td><td>-1.4<sup>***</sup></td><td>0.7<sup>***</sup></td><td>-0.01</td><td>-0.01</td><t
d>0.4</td><td>0.1</td><td>1.0<sup>***</sup></td><td>-0.02</td><td>-0.5<sup>**</sup></td>
<td>0.6<sup>**</sup></td></tr>
```

```
## <tr><td style="text-align:left"></td><td>(-1.1, -0.2)</td><td>(-0.2, 0.9)</td><td>(-
0.6, 0.03)</td><td>(-1.7, -1.1)</td><td>(0.3, 1.0)</td><td>(-0.4, 0.3)</td><td>(-0.4, 0.
4)</td><td>(-0.1, 0.9)</td><td>(-0.4, 0.5)</td><td>(0.4, 1.5)</td><td>(-0.2, 0.2)</td><t
d>(-0.9, -0.1)</td><td>(0.1, 1.0)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">hcc</td><td>705.5<sup>***</sup></td><td>348.4<sup>***
</sup></td><td>205.0<sup>***</sup></td><td>296.0<sup>***</sup></td><td>217.5<sup>***</su
p></td><td>377.6<sup>***</sup></td><td>173.9<sup>***</sup></td><td>481.0<sup>***</sup></
td><td>99.0<sup>***</sup></td><td>550.7<sup>***</sup></td><td>6.9</td><td>289.2<sup>***
</sup></td><td>340.6<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(674.6, 736.4)</td><td>(310.1, 386.6)</td><t
d>(185.6, 224.4)</td><td>(273.4, 318.6)</td><td>(191.7, 243.2)</td><td>(354.7, 400.6)</t
d><td>(144.9, 202.8)</td><td>(445.0, 516.9)</td><td>(71.2, 126.7)</td><td>(513.6, 587.9)
</td><td>(-6.9, 20.8)</td><td>(263.1, 315.3)</td><td>(312.9, 368.2)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">Observations</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851
</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851</td
><td>2,851</td><td>2,851</td><td>2,851</td></tr>
## <tr><td style="text-align:left">Log Likelihood</td><td>-4,518.9</td><td>-5,081.2</td>
<td>-3,264.1</td><td>-3,679.8</td><td>-4,033.2</td><td>-3,718.5</td><td>-4,344.3</td><td
>-4,917.3</td><td>-4,231.9</td><td>-5,000.9</td><td>-2,338.6</td><td>-4,068.0</td><td>-
4,221.0</td></tr>
## <tr><td style="text-align:left">Akaike Inf. Crit.</td><td>9,969.8</td><td>11,094.4</t
d><td>7,460.2</td><td>8,291.6</td><td>8,998.4</td><td>8,368.9</td><td>9,620.7</td><td>1
0,766.6</td><td>9,395.8</td><td>10,933.7</td><td>5,609.1</td><td>9,068.0</td><td>9,373.9
</td></tr>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"><em>Note:</em></td><td colspan="13" style="text-align:right"><sup>*</
sup>p<0.05; <sup>**</sup>p<0.01; <sup>***</sup>p<0.001</td></tr>
## </table>
```

```
stargazer::stargazer(glmMatched7_s, glmMatched8_s, glmMatched9_s, glmMatched10_s, glmMat
ched10a_s, glmMatched10b_s,glmMatched10c_s,glmMatched10d_s,glmMatched10e_s,glmMatched10f
_s,glmMatched10g_s,
          title="Utilization",
          type = "html",
          keep=c("om_flag","age","female","mm","hcc"),
          ci=TRUE, ci.level=0.95,
          apply.coef=exponentiate,apply.se = exponentiate,
          digits = 1,
          star.cutoffs = c(0.05, 0.01, 0.001),
          column.labels = c("Emergency", "Hospital", "Primary Care", "Specialist", "Ment
al Health", "Physical Therapy", "Drug admin", "Surgery", "Maternity", "Labs", "Radiolog
y"),
          out = "table2s.htm")
```

```
##
## <table style="text-align:center"><caption><strong>Utilization</strong></caption>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"></td><td colspan="11"><em>Dependent variable:</em></td></tr>
## <tr><td></td><td colspan="11" style="border-bottom: 1px solid black"></td></tr>
## <tr><td style="text-align:left"></td><td>logcount_er</td><td>logcount_hosp</td><td>lo
gcount_pcp</td><td>logcount_spec</td><td>logcount_mh</td><td>logcount_pt</td><td>logcoun
t_drugadmin</td><td>logcount_surg</td><td>logcount_maternity</td><td>logcount_labs</td><
td>logcount_rads</td></tr>
## <tr><td style="text-align:left"></td><td>Emergency</td><td>Hospital</td><td>Primary C
are</td><td>Specialist</td><td>Mental Health</td><td>Physical Therapy</td><td>Drug admin
</td><td>Surgery</td><td>Maternity</td><td>Labs</td><td>Radiology</td></tr>
## <tr><td style="text-align:left"></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td>
<td>(5)</td><td>(6)</td><td>(7)</td><td>(8)</td><td>(9)</td><td>(10)</td><td>(11)</td></
tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">om_flag</td><td>-3.0<sup>***</sup></td><td>-0.6<sup>***</sup></td><td
>-2.8<sup>***</sup></td><td>-5.7<sup>***</sup></td><td>-0.4</td><td>-4.5<sup>***</sup></
td><td>-6.4<sup>***</sup></td><td>-4.2<sup>***</sup></td><td>-0.1<sup>***</sup></td><td>
-6.5<sup>***</sup></td><td>-2.9<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-3.9, -2.1)</td><td>(-0.9, -0.4)</td><td>(-
3.7, -1.8)</td><td>(-6.3, -5.1)</td><td>(-1.1, 0.3)</td><td>(-6.5, -2.5)</td><td>(-7.5,
-5.4)</td><td>(-5.0, -3.4)</td><td>(-0.1, -0.1)</td><td>(-8.2, -4.7)</td><td>(-3.5, -2.
3)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">age</td><td>-0.03</td><td>-0.03<sup>***</sup></td><td
>-0.1<sup>**</sup></td><td>0.1<sup>***</sup></td><td>-0.01</td><td>0.2<sup>***</sup></td
><td>-0.2<sup>***</sup></td><td>0.1<sup>***</sup></td><td>-0.004<sup>***</sup></td><td>
0.3<sup>***</sup></td><td>0.1<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-0.1, 0.01)</td><td>(-0.04, -0.02)</td><td>
(-0.1, -0.03)</td><td>(0.03, 0.1)</td><td>(-0.04, 0.02)</td><td>(0.1, 0.3)</td><td>(-0.
3, -0.2)</td><td>(0.1, 0.2)</td><td>(-0.01, -0.003)</td><td>(0.3, 0.4)</td><td>(0.02, 0.
1)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">female</td><td>-0.6</td><td>-0.2</td><td>1.2</td><td>
-0.2</td><td>-0.5</td><td>-2.3</td><td>-1.3</td><td>1.3<sup>*</sup></td><td>0.1<sup>***
</sup></td><td>8.0<sup>***</sup></td><td>1.6<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-1.9, 0.8)</td><td>(-0.5, 0.2)</td><td>(-0.
3, 2.7)</td><td>(-1.0, 0.7)</td><td>(-1.5, 0.5)</td><td>(-5.3, 0.7)</td><td>(-2.9, 0.3)
</td><td>(0.2, 2.5)</td><td>(0.1, 0.2)</td><td>(5.4, 10.7)</td><td>(0.7, 2.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">mm</td><td>-0.1<sup>**</sup></td><td>-0.01<sup>*</sup
></td><td>-0.2<sup>***</sup></td><td>-0.01</td><td>-0.03</td><td>-0.1</td><td>-0.2<sup>*
**</sup></td><td>-0.01</td><td>-0.001<sup>*</sup></td><td>-0.3<sup>***</sup></td><td>-0.
03<sup>*</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-0.1, -0.03)</td><td>(-0.02, -0.002)</td><t
d>(-0.3, -0.2)</td><td>(-0.04, 0.02)</td><td>(-0.1, 0.01)</td><td>(-0.2, 0.01)</td><td>
(-0.2, -0.1)</td><td>(-0.04, 0.03)</td><td>(-0.003, -0.000)</td><td>(-0.4, -0.2)</td><td
>(-0.1, -0.004)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
```

```
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">hcc</td><td>11.6<sup>***</sup></td><td>3.6<sup>***</s
up></td><td>20.9<sup>***</sup></td><td>6.7<sup>***</sup></td><td>9.5<sup>***</sup></td><
td>20.4<sup>***</sup></td><td>7.1<sup>***</sup></td><td>10.5<sup>***</sup></td><td>0.04
</td><td>42.2<sup>***</sup></td><td>11.8<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(9.0, 14.1)</td><td>(2.9, 4.3)</td><td>(18.
1, 23.8)</td><td>(5.0, 8.4)</td><td>(7.5, 11.5)</td><td>(14.6, 26.2)</td><td>(4.0, 10.2)
</td><td>(8.3, 12.8)</td><td>(-0.04, 0.1)</td><td>(37.0, 47.3)</td><td>(10.0, 13.5)</td>
</tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">Observations</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851
</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851</td
><td>2,851</td></tr>
## <tr><td style="text-align:left">Log Likelihood</td><td>2,365.3</td><td>6,133.1</td><t
d>2,094.0</td><td>3,549.5</td><td>3,107.3</td><td>73.5</td><td>1,849.8</td><td>2,737.6</
td><td>12,237.1</td><td>424.7</td><td>3,519.5</td></tr>
## <tr><td style="text-align:left">Akaike Inf. Crit.</td><td>-3,798.6</td><td>-11,334.3
</td><td>-3,256.1</td><td>-6,166.9</td><td>-5,282.5</td><td>785.0</td><td>-2,767.6</td><
td>-4,543.3</td><td>-23,542.2</td><td>82.7</td><td>-6,107.0</td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"><em>Note:</em></td><td colspan="11" style="text-align:right"><sup>*</
sup>p<0.05; <sup>**</sup>p<0.01; <sup>***</sup>p<0.001</td></tr>
## </table>
```

```
stargazer::stargazer(glmMatched11_s, glmMatched11b_s, glmMatched11c_s, glmMatched5c_s, g
lmMatched5ca_s, glmMatched5cb_s, glmMatched5cc_s, glmMatched5cd_s, glmMatched5ce_s,
glmMatched5cf_s, glmMatched5cg_s,
        title="Cost per Utilization",
        type = "html",
        keep=c("om_flag","age","female","mm","hcc"),
        ci=TRUE, ci.level=0.95,
        apply.coef=exponentiate,apply.se = exponentiate,
        digits = 1,
        star.cutoffs = c(0.05, 0.01, 0.001),
        column.labels = c("Emergency", "Hospital", "Primary Care", "Specialist", "Ment
al Health", "Physical Therapy", "Drug admin", "Surgery", "Maternity", "Labs", "Radiolog
y"),
        out = "table3s.htm")
```

```
## 
## <table style="text-align:center"><caption><strong>Cost per Utilization</strong></caption>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style="text-align:left"></td><td colspan="11"><em>Dependent variable:</em></td></tr>
## <tr><td></td><td colspan="11" style="border-bottom: 1px solid black"></td></tr>
## <tr><td style="text-align:left"></td><td>logcost_per_er</td><td>logcost_per_hosp</td><td>logcost_per_pcp</td><td>logcost_per_spec</td><td>logcost_per_mh</td><td>logcost_per_pt</td><td>logcost_per_drugadmin</td><td>logcost_per_surg</td><td>logcost_per_maternity</td><td>logcost_per_labs</td><td>logcost_per_rads</td></tr>
## <tr><td style="text-align:left"></td><td>Emergency</td><td>Hospital</td><td>Primary Care</td><td>Specialist</td><td>Mental Health</td><td>Physical Therapy</td><td>Drug admin</td><td>Surgery</td><td>Maternity</td><td>Labs</td><td>Radiology</td></tr>
## <tr><td style="text-align:left"></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td><td>(5)</td><td>(6)</td><td>(7)</td><td>(8)</td><td>(9)</td><td>(10)</td><td>(11)</td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style="text-align:left">om_flag</td><td>-0.5</td><td>218.4<sup>***</sup></td><td>23.2<sup>***</sup></td><td>10.9<sup>***</sup></td><td>1.0</td><td>43.1<sup>***</sup></td><td>10.7<sup>**</sup></td><td>-18.6<sup>**</sup></td><td>-81.6<sup>***</sup></td><td>8.2<sup>**</sup></td><td>-16.6<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-6.0, 5.1)</td><td>(201.9, 234.8)</td><td>(20.6, 25.8)</td><td>(6.4, 15.4)</td><td>(-11.6, 13.7)</td><td>(37.7, 48.5)</td><td>(3.2, 18.3)</td><td>(-32.2, -5.0)</td><td>(-107.7, -55.5)</td><td>(2.9, 13.6)</td><td>(-25.5, -7.7)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">age</td><td>-0.3<sup>*</sup></td><td>-0.1</td><td>0.1<sup>*</sup></td><td>-0.1</td><td>0.7<sup>*</sup></td><td>-0.1</td><td>-1.2<sup>***</sup></td><td>-0.1</td><td>-2.3<sup>***</sup></td><td>1.2<sup>***</sup></td><td>1.8<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-0.5, -0.02)</td><td>(-0.9, 0.7)</td><td>(0.02, 0.3)</td><td>(-0.3, 0.1)</td><td>(0.1, 1.3)</td><td>(-0.4, 0.1)</td><td>(-1.5, -0.8)</td><td>(-0.7, 0.5)</td><td>(-3.4, -1.1)</td><td>(0.9, 1.4)</td><td>(1.4, 2.2)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">female</td><td>-10.6<sup>*</sup></td><td>-12.6</td><td>-6.7<sup>**</sup></td><td>1.3</td><td>-11.1</td><td>-6.2</td><td>36.5<sup>***</sup></td><td>1.1</td><td>11.8</td><td>1.0</td><td>6.0</td></tr>
## <tr><td style="text-align:left"></td><td>(-19.0, -2.2)</td><td>(-37.7, 12.5)</td><td>(-10.6, -2.7)</td><td>(-5.5, 8.1)</td><td>(-30.4, 8.1)</td><td>(-14.3, 2.0)</td><td>(25.2, 47.9)</td><td>(-19.5, 21.7)</td><td>(-28.5, 52.1)</td><td>(-7.1, 9.1)</td><td>(-7.4, 19.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">mm</td><td>0.5<sup>***</sup></td><td>-0.4</td><td>-0.1<sup>*</sup></td><td>-0.2<sup>*</sup></td><td>-0.2</td><td>-0.1</td><td>0.2</td><td>-0.5</td><td>3.9<sup>***</sup></td><td>-0.1</td><td>0.1</td></tr>
## <tr><td style="text-align:left"></td><td>(0.3, 0.8)</td><td>(-1.1, 0.3)</td><td>(-0.3, -0.02)</td><td>(-0.4, -0.02)</td><td>(-0.8, 0.3)</td><td>(-0.3, 0.2)</td><td>(-0.1, 0.6)</td><td>(-1.1, 0.1)</td><td>(2.7, 5.0)</td><td>(-0.3, 0.2)</td><td>(-0.3, 0.5)</td></tr>
```

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## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">hcc</td><td>-2.0</td><td>148.2<sup>***</sup></td><td>
0.01</td><td>6.2</td><td>95.6<sup>***</sup></td><td>15.3</td><td>22.3</td><td>64.7<sup>*
*</sup></td><td>-30.9</td><td>26.1<sup>**</sup></td><td>33.0<sup>*</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-18.5, 14.5)</td><td>(96.8, 199.5)</td><td>
(-7.7, 7.8)</td><td>(-7.2, 19.5)</td><td>(56.7, 134.5)</td><td>(-0.8, 31.3)</td><td>(-0.
3, 44.9)</td><td>(22.9, 106.5)</td><td>(-116.3, 54.4)</td><td>(10.2, 42.1)</td><td>(6.2,
59.8)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">Observations</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851
</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851</td><td>2,851</td
><td>2,851</td></tr>
## <tr><td style="text-align:left">Log Likelihood</td><td>-2,825.4</td><td>-5,840.1</td>
<td>-729.6</td><td>-2,239.1</td><td>-5,124.6</td><td>-2,745.5</td><td>-3,678.6</td><td>-
5,309.8</td><td>-7,094.8</td><td>-2,725.6</td><td>-4,139.0</td></tr>
## <tr><td style="text-align:left">Akaike Inf. Crit.</td><td>6,582.8</td><td>12,612.3</t
d><td>2,391.2</td><td>5,410.3</td><td>11,181.2</td><td>6,423.0</td><td>8,289.2</td><td>1
1,551.6</td><td>15,121.6</td><td>6,383.1</td><td>9,210.0</td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"><em>Note:</em></td><td colspan="11" style="text-align:right"><sup>*</
sup>p<0.05; <sup>**</sup>p<0.01; <sup>***</sup>p<0.001</td></tr>
## </table>
```

```
save.image("onemedical.RData")
```

# alternative control group of non-spaceX members to compare OM-SpaceX users

```
clm_alt = clm_tot %>%
  filter(om_flag==1)

clm_cont = read_csv("spacex_controls.csv")

clm_dol2 = clm_cont
clm_dol2$`Metaclaims Analytics Medical Allowed Amount` = as.numeric(gsub("[\\$,]", "", c
lm_dol2$`Metaclaims Analytics Medical Allowed Amount`))
clm_dol2$`Metaclaims Analytics Medical First Name` = str_to_title(clm_dol2$`Metaclaims A
nalytics Medical First Name`)
clm_dol2$`Metaclaims Analytics Medical Last Name` = str_to_title(clm_dol2$`Metaclaims An
alytics Medical Last Name`)

clm_sub2 = clm_dol2 %>%
  mutate(personid = (`Metaclaims Analytics Medical Person ID`),
         female = (`Metaclaims Analytics Medical Gender`=="F"),
         firstname = `Metaclaims Analytics Medical First Name`,
         lastname = `Metaclaims Analytics Medical Last Name`,
         pos = `Metaclaims Analytics Medical Service Category Detail`,
         dos = `Metaclaims Analytics Medical Service Date Start Date`,
         om_flag = ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="460695495")&
(`Metaclaims Analytics Medical Billing Prov Npi`==1467701821))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="460741732")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1073862256))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="362169147")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1336709112))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="814542216")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1518438712))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="383906267")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1528538774))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="471708588")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1184014854))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="271346767")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1467781641))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="911942315")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1073553947))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="812141065")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1467800383))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="452282261")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1962798645))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="273009385")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1861709487))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="812980907")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1598214397))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="270243800")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1144457151))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="020619758")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1497786883))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="461773122")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1508103169))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="800925565")&(`Metacla
ims Analytics Medical Billing Prov Npi`==1417382102))|
         ((`Metaclaims Analytics Medical Billing Prov Bill ID`=="800925565")&(`Metacla
```

```
ims Analytics Medical Billing Prov Npi`==1922470392)),
        em_flag = ((`Metaclaims Analytics Medical Procedure Code`=='99201')|
                   (`Metaclaims Analytics Medical Procedure Code`=='99202')|
                   (`Metaclaims Analytics Medical Procedure Code`=='99203')|
                   (`Metaclaims Analytics Medical Procedure Code`=='99204')|
                   (`Metaclaims Analytics Medical Procedure Code`=='99205')|
                   (`Metaclaims Analytics Medical Procedure Code`=='99211')|
                   (`Metaclaims Analytics Medical Procedure Code`=='99212')|
                   (`Metaclaims Analytics Medical Procedure Code`=='99213')|
                   (`Metaclaims Analytics Medical Procedure Code`=='99214')|
                   (`Metaclaims Analytics Medical Procedure Code`=='99215')),
        diag1 = (`Metaclaims Analytics Medical Principal Diag`),
        cost_md = (`Metaclaims Analytics Medical Allowed Amount`)) %>%
  filter(dos<="2019-07-01")



clm_sub2 = clm_sub2 %>%
  group_by(firstname, lastname,female) %>%
  # filter(any(em_flag==1)) %>%
  summarise(om_flag = getmode(om_flag[em_flag==1]),
            diag1 = getmode(diag1),
            count_drugadmin = sum((pos=="Administered drug inc Chemo")|(pos=="Administra
tion of drug")|(pos=="Immunizations")),
            cost_drugadmin =sum((cost_md[pos=="Administered drug inc Chemo"|pos=="Admini
stration of drug"|(pos=="Immunizations")])),
            cost_per_drugadmin = mean((cost_md[pos=="Administered drug inc Chemo"|pos==
"Administration of drug"|(pos=="Immunizations")]),na.rm=T),
            count_surg = sum((pos=="Anesthesia")|(pos=="Outpatient Surgery")|(pos=="Surg
ery")|(pos=="Surgical and Transplant")),
            cost_surg = sum(cost_md[(pos=="Anesthesia")|(pos=="Outpatient Surgery")|(pos
=="Surgery")|(pos=="Surgical and Transplant")]),
            cost_per_surg = mean(cost_md[(pos=="Anesthesia")|(pos=="Outpatient Surgery")
|(pos=="Surgery")|(pos=="Surgical and Transplant")],na.rm=T),
            count_maternity = sum(pos=="Labor and Delivery" | pos=="Newborns"),
            cost_maternity = sum(cost_md[(pos=="Labor and Delivery" | pos=="Newborns"
)]),
            cost_per_maternity = mean(cost_md[(pos=="Labor and Delivery" | pos=="Newborn
s")],na.rm=T),
            count_labs = sum(pos=="Lab Pathology" | pos=="Pathology Lab"),
            cost_labs = sum(cost_md[(pos=="Lab Pathology" | pos=="Pathology Lab")]),
            cost_per_labs = mean(cost_md[(pos=="Lab Pathology" | pos=="Pathology Lab")],
na.rm=T),
            count_er = sum(pos=="Emergency Room"),
            cost_er = sum(cost_md[pos=="Emergency Room"]),
            cost_per_er = mean(cost_md[pos=="Emergency Room"],na.rm=T),
            count_rads = sum(pos=="Radiology"),
            cost_rads = sum(cost_md[pos=="Radiology"]),
            cost_per_rads = mean(cost_md[pos=="Radiology"],na.rm=T),
            count_hosp = sum(pos=="Inpatient Visits"|pos=="Medical"),
            cost_hosp = sum(cost_md[pos=="Inpatient Visits"|pos=="Medical"]),
            cost_per_hosp = mean(cost_md[pos=="Inpatient Visits"|pos=="Medical"],na.rm=T
),
            count_pcp = sum(((pos=="Office Visits - PCP")|(pos=="Preventive Visits - PC
```

```
P"))),
              cost_pcp = sum((cost_md[(pos=="Office Visits - PCP"|pos=="Preventive Visits
 - PCP")]))),
              cost_per_pcp = mean((cost_md[(pos=="Office Visits - PCP"|pos=="Preventive Vi
sits - PCP")]),na.rm=T),
              count_spec = sum((pos=="Office Visits - Specialist")|(pos=="Preventive Visit
s - Specialist")),
              cost_spec = sum((cost_md[pos=="Office Visits - Specialist"|pos=="Preventive
 Visits - Specialist"])),
              cost_per_spec = mean((cost_md[pos=="Office Visits - Specialist"|pos=="Preven
tive Visits - Specialist"]),na.rm=T),
              count_mh = sum(pos=="Mental Health and Substance Use" | pos=="Psychiatry"),
              cost_mh = sum(cost_md[pos=="Mental Health and Substance Use" | pos=="Psychia
try"]),
              cost_per_mh = mean(cost_md[pos=="Mental Health and Substance Use" | pos=="Ps
ychiatry"], na.rm=T),
              count_pt = sum(pos=="Physical Medicine"),
              cost_pt = sum(cost_md[pos=="Physical Medicine"]),
              cost_per_pt =  mean(cost_md[pos=="Physical Medicine"], na.rm=T),
              cost_other = sum(cost_md[(pos!="Administered drug inc Chemo")|(pos!="Adminis
tration of drug")|(pos!="Immunizations")|(pos!="Anesthesia")|(pos!="Outpatient Surgery")
|(pos!="Surgery")|(pos!="Surgical and Transplant")|(pos!="Labor and Delivery") | (pos!=
"Newborns")|(pos!="Lab Pathology") | (pos!="Pathology Lab")|(pos!="Emergency Room")|(po
s!="Radiology")|(pos!="Inpatient Visits")|(pos!="Medical")|(pos!="Inpatient Visits")|(po
s!="Medical")|(pos!="Office Visits - PCP")|(pos!="Preventive Visits - PCP")|(pos!="Offic
e Visits - Specialist")|(pos!="Preventive Visits - Specialist")|(pos!="Mental Health and
Substance Use" | pos!="Psychiatry")|(pos!="Physical Medicine")]),
              cost_md = sum(cost_other+cost_drugadmin+cost_surg+cost_maternity+cost_labs+c
ost_er+cost_rads+cost_hosp+cost_pcp+cost_spec+cost_mh+cost_pt)) %>%
  select(firstname,lastname, female,om_flag,diag1,cost_md,count_er,cost_er,count_hosp,co
st_hosp,count_pcp,cost_pcp,count_spec,cost_spec,count_mh,cost_mh,count_pt,cost_pt, count
_drugadmin,cost_drugadmin,count_surg,cost_surg,count_maternity,cost_maternity,count_lab
s,cost_labs,count_rads,cost_rads,cost_per_drugadmin, cost_per_surg,cost_per_maternity,co
st_per_labs,cost_per_er,cost_per_rads,cost_per_hosp,cost_per_pcp,cost_per_spec,cost_per_
mh,cost_per_pt) %>%
  filter(!any(om_flag)==1) %>%
  ungroup()
clm_sub2$female[is.na(clm_sub2$female)==1]=0


clm_tot2 = bind_rows(clm_alt,clm_sub2)

mbr_alt = read_csv("spacex_controls_mbr.csv")

mbr_sub2 = mbr_alt %>%
  filter(str_detect(`Analytics Member Months Current Postal Code`,"9$")==T)
mbr_sub2$`Analytics Member Months First Name` = str_to_title(mbr_sub2$`Analytics Member
 Months First Name`)
mbr_sub2$`Analytics Member Months Last Name` = str_to_title(mbr_sub2$`Analytics Member M
onths Last Name`)

mbr_sub2 = mbr_sub2 %>%
  mutate(personid = `Analytics Member Months Person ID`) %>%
  group_by(personid) %>%
```

```
    mutate(start = min(`Analytics Member Months Start Date`),
           end = max(`Analytics Member Months End Date`),
           age = mean(`Analytics Member Months Age`),
           female = (`Analytics Member Months Gender`=='F'),
           firstname = `Analytics Member Months First Name`,
           lastname = `Analytics Member Months Last Name`,
           membermo = interval(start,end)/months(1),
           DOB = `Analytics Member Months Date of Birth Date`,
           zip = as.factor(`Analytics Member Months Current Postal Code`)) %>%
    select(age, female, personid, firstname, lastname, membermo, DOB, zip) %>%
    distinct()

mbr_sub2 = bind_rows(mbr_sub,mbr_sub2)

rx_alt = read_csv("spacex_controls_rx.csv")


rx_dol2 = rx_alt
rx_dol2$`Analytics Claims Pharmacy Allowed Amount` = as.numeric(gsub("[\\$,]", "", rx_do
l2$`Analytics Claims Pharmacy Allowed Amount`))
rx_dol2$`Analytics Claims Pharmacy First Name` = str_to_title(rx_dol2$`Analytics Claims
 Pharmacy First Name`)
rx_dol2$`Analytics Claims Pharmacy Last Name` = str_to_title(rx_dol2$`Analytics Claims P
harmacy Last Name`)

rx_alt = rx_dol2 %>%
  mutate(personid = `Analytics Claims Pharmacy Person ID`) %>%
  group_by(personid) %>%
  mutate(female = (`Analytics Claims Pharmacy Gender`=="F"),
         firstname = `Analytics Claims Pharmacy First Name`,
         lastname = `Analytics Claims Pharmacy Last Name`,
         cost_rx = sum(`Analytics Claims Pharmacy Allowed Amount`)) %>%
  select(female, personid, firstname,lastname,cost_rx) %>%
  distinct()
rx_sub2 = rbind(rx_sub,rx_alt)

rx_sub2 = bind_rows(rx_sub,rx_sub2)


spacex_dat2 = mbr_sub2 %>%
  full_join(clm_tot2, by = c("firstname","lastname","female")) %>%
  full_join(rx_sub2, by = c("firstname","lastname","female")) %>%
  mutate(om_flag = replace_na(om_flag,0)) %>%
  distinct()

PERSON2 = spacex_dat2 %>%
  ungroup() %>%
  mutate(HICNO = personid.x,
         SEX = if_else(female==1,"F","M"),
         DOB = DOB,
         MCAID = 0,
         NMCAID = 0,
         OREC = 0) %>%
  select(HICNO, SEX, MCAID, NMCAID, OREC, DOB) %>%
```

```
    filter(!is.na(HICNO))

cmshcc_map <- load_cmshcc_map()

clm2 <- rbind(clm,clm_cont)

clm_hcc2  = clm2 %>%
  mutate(HICNO = (`Metaclaims Analytics Medical Person ID`),
         diag1 = `Metaclaims Analytics Medical Principal Diag`,
         diag2 = `Metaclaims Analytics Medical Diag02`,
         diag3 = `Metaclaims Analytics Medical Diag03`,
         diag4 = `Metaclaims Analytics Medical Diag04`,
         diag5 = `Metaclaims Analytics Medical Diag05`,
         diag6 = `Metaclaims Analytics Medical Diag06`,
         diag7 = `Metaclaims Analytics Medical Diag07`,
         diag8 = `Metaclaims Analytics Medical Diag08`,
         diag9 = `Metaclaims Analytics Medical Diag09`,
         diag10 = `Metaclaims Analytics Medical Diag10`) %>%
  gather(Diag, DX, diag1:diag10, factor_key=T) %>%
  select(HICNO,DX) %>%
  arrange(HICNO)  %>%
  filter(!is.na(HICNO), !is.na(DX)) %>%
  distinct()

DIAG2 = bind_rows(clm_hcc2, ctr_hcc)

hcc2 = evaluate_v22_2017(PERSON2, DIAG2, "Community_NonDual_Aged")


spacex_dat_ana2 = mbr_sub2 %>%
  full_join(clm_tot2, by = c("firstname","lastname","female")) %>%
  full_join(rx_sub2, by = c("firstname","lastname","female")) %>%
  full_join(hcc2, by = c("personid.x" = "HICNO")) %>%
  left_join(ccs, c("diag1")) %>%
  distinct() %>%
  filter(!is.na(personid.x)) %>%
  mutate(mm = membermo,
         om_flag = replace_na(om_flag,0),
         cost_md = replace_na(cost_md,0),
         count_er = replace_na(count_er,0),
         cost_er = replace_na(cost_er,0),
         count_hosp = replace_na(count_hosp,0),
         cost_hosp = replace_na(cost_hosp,0),
         count_pcp = replace_na(count_pcp,0),
         cost_pcp = replace_na(cost_pcp,0),
         count_spec = replace_na(count_spec,0),
         cost_spec = replace_na(cost_spec,0),
         count_mh = replace_na(count_mh,0),
         count_pt = replace_na(count_pt,0),
         cost_pt = replace_na(cost_pt,0),
         cost_mh = replace_na(cost_mh,0),
         cost_rx = replace_na(cost_rx,0),
         cost_md = (cost_md+cost_rx)/mm,
         cost_rx = (cost_rx)/mm,
```

```
          cost_er = (cost_er)/mm,
          cost_hosp = (cost_hosp)/mm,
          cost_pcp = (cost_pcp)/mm,
          cost_spec = (cost_spec)/mm,
          cost_mh = (cost_mh)/mm,
          cost_pt = (cost_pt)/mm,
          count_er = (count_er)/mm,
          count_hosp = (count_hosp)/mm,
          count_pcp = (count_pcp)/mm,
          count_spec = (count_spec)/mm,
          count_mh = (count_mh)/mm,
          count_pt = (count_pt)/mm,
          count_drugadmin = (count_drugadmin)/mm,
          cost_drugadmin = (cost_drugadmin)/mm,
          count_surg = (count_surg)/mm,
          cost_surg = (cost_surg)/mm,
          count_maternity = (count_maternity)/mm,
          cost_maternity = (cost_maternity)/mm,
          count_labs = (count_labs)/mm,
          cost_labs = (cost_labs)/mm,
          count_rads = (count_rads)/mm,
          cost_rads = (cost_rads)/mm,
          count_drugadmin = replace_na(count_drugadmin,0),
          cost_drugadmin = replace_na(cost_drugadmin,0),
          count_surg = replace_na(count_surg,0),
          cost_surg = replace_na(cost_surg,0),
          count_maternity = replace_na(count_maternity,0),
          cost_maternity = replace_na(cost_maternity,0),
          count_labs = replace_na(count_labs,0),
          cost_labs = replace_na(cost_labs, 0),
          count_rads = replace_na(count_rads, 0),
          cost_rads = replace_na(cost_rads,0),
          Community_NonDual_Aged = replace_na(Community_NonDual_Aged,0),
          hcc = Community_NonDual_Aged,
          ccs = replace_na(ccs,0),
          mm = membermo,
          ccs = as.factor(ccs),
          zip = as.factor(zip))


spacex_dat_ana2$cost_md[spacex_dat_ana2$om_flag==1] = membership_pmpm + spacex_dat_ana2
$cost_md[spacex_dat_ana2$om_flag==1]

summary(spacex_dat_ana2)
```

```
##       age            female            personid.x       firstname
##  Min.   : 0.00   Mode :logical    Min.   :169771   Length:33630
##  1st Qu.:17.71   FALSE:20023      1st Qu.:227614   Class :character
##  Median :28.50   TRUE :13607      Median :315652   Mode  :character
##  Mean   :27.91                    Mean   :382908
##  3rd Qu.:37.00                    3rd Qu.:517105
##  Max.   :85.50                    Max.   :848901
##
##    lastname            membermo            DOB
##  Length:33630       Min.   : 0.4194   Min.   :1933-01-29
##  Class :character   1st Qu.:11.9677   1st Qu.:1980-08-16
##  Mode  :character   Median :23.9677   Median :1989-02-11
##                     Mean   :26.0793   Mean   :1989-11-19
##                     3rd Qu.:40.9677   3rd Qu.:1999-12-21
##                     Max.   :47.9677   Max.   :2019-08-12
##
##     zip               om_flag             diag1
##  Length:33630       Min.   :0.00000   Length:33630
##  Class :character   1st Qu.:0.00000   Class :character
##  Mode  :character   Median :0.00000   Mode  :character
##                     Mean   :0.06343
##                     3rd Qu.:0.00000
##                     Max.   :1.00000
##
##     cost_md             count_er            cost_er
##  Min.   :      0.00   Min.   : 0.00000   Min.   :    0.00
##  1st Qu.:      0.00   1st Qu.: 0.00000   1st Qu.:    0.00
##  Median :      3.53   Median : 0.00000   Median :    0.00
##  Mean   :    250.77   Mean   : 0.03125   Mean   :   10.74
##  3rd Qu.:     71.34   3rd Qu.: 0.00000   3rd Qu.:    0.00
##  Max.   :124161.41    Max.   :20.66667   Max.   :4257.32
##
##     count_hosp          cost_hosp           count_pcp
##  Min.   :0.000000    Min.   :     0.00   Min.   : 0.00000
##  1st Qu.:0.000000    1st Qu.:     0.00   1st Qu.: 0.00000
##  Median :0.000000    Median :     0.00   Median : 0.00000
##  Mean   :0.003495    Mean   :     8.49   Mean   : 0.06926
##  3rd Qu.:0.000000    3rd Qu.:     0.00   3rd Qu.: 0.00000
##  Max.   :5.904762    Max.   :60969.26    Max.   :12.40000
##
##     cost_pcp            count_spec          cost_spec           count_mh
##  Min.   :   0.00     Min.   : 0.00000   Min.   :   0.000    Min.   :0.00000
##  1st Qu.:   0.00     1st Qu.: 0.00000   1st Qu.:   0.000    1st Qu.:0.00000
##  Median :   0.00     Median : 0.00000   Median :   0.000    Median :0.00000
##  Mean   :  10.23     Mean   : 0.03415   Mean   :   4.156    Mean   :0.01577
##  3rd Qu.:   0.00     3rd Qu.: 0.00000   3rd Qu.:   0.000    3rd Qu.:0.00000
##  Max.   :1421.17     Max.   :10.18182   Max.   :1512.731    Max.   :9.67273
##
##     cost_mh             count_pt            cost_pt
##  Min.   :   0.000    Min.   : 0.0000    Min.   :   0.000
##  1st Qu.:   0.000    1st Qu.: 0.0000    1st Qu.:   0.000
##  Median :   0.000    Median : 0.0000    Median :   0.000
##  Mean   :   2.866    Mean   : 0.1024    Mean   :   4.508
```

```
## 3rd Qu.:    0.000   3rd Qu.: 0.0000   3rd Qu.:    0.000
## Max.    :2039.489   Max.    :53.5761   Max.    :2255.479
##
## count_drugadmin    cost_drugadmin        count_surg
## Min.    : 0.00000   Min.    :    0.000   Min.    : 0.00000
## 1st Qu.: 0.00000   1st Qu.:    0.000   1st Qu.: 0.00000
## Median : 0.00000   Median :    0.000   Median : 0.00000
## Mean    : 0.03306   Mean    :    4.084   Mean    : 0.03303
## 3rd Qu.: 0.00000   3rd Qu.:    0.000   3rd Qu.: 0.00000
## Max.    :20.55526   Max.    :10442.604   Max.    :28.97826
##
##    cost_surg       count_maternity     cost_maternity
## Min.    :     0.00   Min.    :0.0000000   Min.    :     0.000
## 1st Qu.:     0.00   1st Qu.:0.0000000   1st Qu.:     0.000
## Median :     0.00   Median :0.0000000   Median :     0.000
## Mean    :    26.12   Mean    :0.0003532   Mean    :    4.421
## 3rd Qu.:     0.00   3rd Qu.:0.0000000   3rd Qu.:     0.000
## Max.    :22297.75   Max.    :0.6684636   Max.    :10958.036
##
##    count_labs        cost_labs         count_rads
## Min.    : 0.0000   Min.    :    0.000   Min.    : 0.00000
## 1st Qu.: 0.0000   1st Qu.:    0.000   1st Qu.: 0.00000
## Median : 0.0000   Median :    0.000   Median : 0.00000
## Mean    : 0.1658   Mean    :    6.358   Mean    : 0.02842
## 3rd Qu.: 0.0000   3rd Qu.:    0.000   3rd Qu.: 0.00000
## Max.    :39.2667   Max.    :2570.304   Max.    :12.42510
##
##    cost_rads         cost_per_drugadmin cost_per_surg
## Min.    :     0.000   Min.    :     0.00   Min.    :     0.00
## 1st Qu.:     0.000   1st Qu.:    24.36   1st Qu.:    87.76
## Median :     0.000   Median :    37.90   Median :   186.08
## Mean    :     8.378   Mean    :    88.13   Mean    :   511.40
## 3rd Qu.:     0.000   3rd Qu.:    74.50   3rd Qu.:   478.07
## Max.    :23669.401   Max.    :5557.10   Max.    :51705.00
##                        NA's    :29478   NA's    :30260
## cost_per_maternity cost_per_labs     cost_per_er       cost_per_rads
## Min.    :     0   Min.    :     0.00   Min.    :     0.0   Min.    :     0.00
## 1st Qu.: 3760   1st Qu.:    12.74   1st Qu.: 204.1   1st Qu.:    47.84
## Median :11652   Median :    20.26   Median : 336.6   Median : 123.76
## Mean    :14110   Mean    :    38.52   Mean    : 398.2   Mean    : 210.68
## 3rd Qu.:18323   3rd Qu.:    38.57   3rd Qu.: 507.7   3rd Qu.: 246.32
## Max.    :40910   Max.    :3335.95   Max.    :3377.4   Max.    :5167.47
## NA's    :33507   NA's    :27087   NA's    :32185   NA's    :29886
## cost_per_hosp      cost_per_pcp     cost_per_spec       cost_per_mh
## Min.    :     0.0   Min.    :  0.0   Min.    :   0.00   Min.    :     0.00
## 1st Qu.:   144.0   1st Qu.:113.3   1st Qu.:  88.97   1st Qu.:    88.83
## Median :   240.5   Median :151.0   Median :114.76   Median : 148.30
## Mean    :  2555.9   Mean    :164.2   Mean    :132.07   Mean    : 212.62
## 3rd Qu.:  3243.6   3rd Qu.:197.5   3rd Qu.:157.73   3rd Qu.: 192.50
## Max.    :36152.9   Max.    :666.7   Max.    :678.62   Max.    :6656.00
## NA's    :33262   NA's    :25264   NA's    :28620   NA's    :32404
##   cost_per_pt       personid.y        cost_rx
## Min.    :   0.00   Min.    :   1021   Min.    :     0.00
## 1st Qu.: 25.01   1st Qu.:226642   1st Qu.:     0.00
```

```
##   Median : 41.81   Median :267699   Median :    0.98
##   Mean   : 53.98   Mean   :363622   Mean   :   60.36
##   3rd Qu.: 69.90   3rd Qu.:496025   3rd Qu.:   10.81
##   Max.   :841.11   Max.   :846140   Max.   :83586.29
##   NA's   :31405    NA's   :12660
##   Community_NonDual_Aged      ccs                     mm
##   Min.   :0.00000        Length:33630        Min.   : 0.4194
##   1st Qu.:0.00000        Class :character    1st Qu.:11.9677
##   Median :0.00000        Mode  :character    Median :23.9677
##   Mean   :0.08488                            Mean   :26.0793
##   3rd Qu.:0.00000                            3rd Qu.:40.9677
##   Max.   :9.53700                            Max.   :47.9677
##
##         hcc
##   Min.   :0.00000
##   1st Qu.:0.00000
##   Median :0.00000
##   Mean   :0.08488
##   3rd Qu.:0.00000
##   Max.   :9.53700
##
```

```
spacex_dat_cov <- c('age', 'female', 'mm', 'membermo', 'hcc', 'ccs', 'diag1',  'zip')

tempData2 = mice(spacex_dat_ana2, m = 1, maxit = 1, meth = 'cart', seed = 1)
```

```
##
##  iter imp variable
##   1   1  cost_per_drugadmin  cost_per_surg  cost_per_maternity  cost_per_labs  cost_p
er_er  cost_per_rads  cost_per_hosp  cost_per_pcp  cost_per_spec  cost_per_mh  cost_per_
pt  personid.y
```

```
spacex_dat_nomiss2 <- as.data.frame(complete(tempData2,1))
summary(spacex_dat_nomiss2)
```

```
##       age            female          personid.x       firstname
##   Min.   : 0.00    Mode :logical    Min.   :169771    Length:33630
##   1st Qu.:17.71    FALSE:20023      1st Qu.:227614    Class :character
##   Median :28.50    TRUE :13607      Median :315652    Mode  :character
##   Mean   :27.91                     Mean   :382908
##   3rd Qu.:37.00                     3rd Qu.:517105
##   Max.   :85.50                     Max.   :848901
##     lastname          membermo            DOB
##   Length:33630      Min.   : 0.4194   Min.   :1933-01-29
##   Class :character  1st Qu.:11.9677   1st Qu.:1980-08-16
##   Mode  :character  Median :23.9677   Median :1989-02-11
##                     Mean   :26.0793   Mean   :1989-11-19
##                     3rd Qu.:40.9677   3rd Qu.:1999-12-21
##                     Max.   :47.9677   Max.   :2019-08-12
##      zip              om_flag            diag1
##   Length:33630      Min.   :0.00000   Length:33630
##   Class :character  1st Qu.:0.00000   Class :character
##   Mode  :character  Median :0.00000   Mode  :character
##                     Mean   :0.06343
##                     3rd Qu.:0.00000
##                     Max.   :1.00000
##     cost_md            count_er            cost_er
##   Min.   :     0.00  Min.   : 0.00000   Min.   :   0.00
##   1st Qu.:     0.00  1st Qu.: 0.00000   1st Qu.:   0.00
##   Median :     3.53  Median : 0.00000   Median :   0.00
##   Mean   :   250.77  Mean   : 0.03125   Mean   :  10.74
##   3rd Qu.:    71.34  3rd Qu.: 0.00000   3rd Qu.:   0.00
##   Max.   :124161.41  Max.   :20.66667   Max.   :4257.32
##    count_hosp          cost_hosp           count_pcp
##   Min.   :0.000000   Min.   :    0.00   Min.   : 0.00000
##   1st Qu.:0.000000   1st Qu.:    0.00   1st Qu.: 0.00000
##   Median :0.000000   Median :    0.00   Median : 0.00000
##   Mean   :0.003495   Mean   :    8.49   Mean   : 0.06926
##   3rd Qu.:0.000000   3rd Qu.:    0.00   3rd Qu.: 0.00000
##   Max.   :5.904762   Max.   :60969.26   Max.   :12.40000
##     cost_pcp          count_spec          cost_spec           count_mh
##   Min.   :   0.00   Min.   : 0.00000   Min.   :   0.000   Min.   :0.00000
##   1st Qu.:   0.00   1st Qu.: 0.00000   1st Qu.:   0.000   1st Qu.:0.00000
##   Median :   0.00   Median : 0.00000   Median :   0.000   Median :0.00000
##   Mean   :  10.23   Mean   : 0.03415   Mean   :   4.156   Mean   :0.01577
##   3rd Qu.:   0.00   3rd Qu.: 0.00000   3rd Qu.:   0.000   3rd Qu.:0.00000
##   Max.   :1421.17   Max.   :10.18182   Max.   :1512.731   Max.   :9.67273
##     cost_mh            count_pt            cost_pt
##   Min.   :   0.000   Min.   : 0.0000   Min.   :   0.000
##   1st Qu.:   0.000   1st Qu.: 0.0000   1st Qu.:   0.000
##   Median :   0.000   Median : 0.0000   Median :   0.000
##   Mean   :   2.866   Mean   : 0.1024   Mean   :   4.508
##   3rd Qu.:   0.000   3rd Qu.: 0.0000   3rd Qu.:   0.000
##   Max.   :2039.489   Max.   :53.5761   Max.   :2255.479
##   count_drugadmin    cost_drugadmin        count_surg
##   Min.   : 0.00000   Min.   :    0.000   Min.   : 0.00000
##   1st Qu.: 0.00000   1st Qu.:    0.000   1st Qu.: 0.00000
##   Median : 0.00000   Median :    0.000   Median : 0.00000
```

```
##    Mean    : 0.03306    Mean    :    4.084    Mean    : 0.03303
##    3rd Qu.: 0.00000    3rd Qu.:    0.000    3rd Qu.: 0.00000
##    Max.    :20.55526    Max.    :10442.604    Max.    :28.97826
##     cost_surg         count_maternity       cost_maternity
##    Min.    :    0.00    Min.    :0.0000000    Min.    :    0.000
##    1st Qu.:    0.00    1st Qu.:0.0000000    1st Qu.:    0.000
##    Median :    0.00    Median :0.0000000    Median :    0.000
##    Mean    :    26.12    Mean    :0.0003532    Mean    :    4.421
##    3rd Qu.:    0.00    3rd Qu.:0.0000000    3rd Qu.:    0.000
##    Max.    :22297.75    Max.    :0.6684636    Max.    :10958.036
##     count_labs          cost_labs          count_rads
##    Min.    : 0.0000    Min.    :    0.000    Min.    : 0.00000
##    1st Qu.: 0.0000    1st Qu.:    0.000    1st Qu.: 0.00000
##    Median : 0.0000    Median :    0.000    Median : 0.00000
##    Mean    : 0.1658    Mean    :    6.358    Mean    : 0.02842
##    3rd Qu.: 0.0000    3rd Qu.:    0.000    3rd Qu.: 0.00000
##    Max.    :39.2667    Max.    :2570.304    Max.    :12.42510
##     cost_rads          cost_per_drugadmin cost_per_surg
##    Min.    :    0.000    Min.    :    0.000    Min.    :    0.00
##    1st Qu.:    0.000    1st Qu.:    0.140    1st Qu.:    0.00
##    Median :    0.000    Median :    1.740    Median :    50.52
##    Mean    :    8.378    Mean    :    13.724    Mean    :    99.35
##    3rd Qu.:    0.000    3rd Qu.:    6.917    3rd Qu.:    99.73
##    Max.    :23669.401    Max.    :5557.095    Max.    :51705.00
##    cost_per_maternity cost_per_labs       cost_per_er      cost_per_rads
##    Min.    :    0    Min.    :    0.000    Min.    :    0.0    Min.    :    0.00
##    1st Qu.: 8456    1st Qu.:    1.155    1st Qu.: 274.8    1st Qu.:    0.00
##    Median :12760    Median :    6.130    Median : 274.8    Median :    10.61
##    Mean    :10846    Mean    :    12.893    Mean    : 270.4    Mean    :    30.85
##    3rd Qu.:14626    3rd Qu.:    15.980    3rd Qu.: 274.8    3rd Qu.:    15.68
##    Max.    :40910    Max.    :3335.953    Max.    :3377.4    Max.    :5167.47
##    cost_per_hosp        cost_per_pcp      cost_per_spec       cost_per_mh
##    Min.    :    0.0    Min.    :    0.00    Min.    :    0.00    Min.    :    0.000
##    1st Qu.: 108.7    1st Qu.: 0.00    1st Qu.: 0.00    1st Qu.:    0.000
##    Median : 164.2    Median : 0.00    Median : 0.00    Median :    0.000
##    Mean    : 202.0    Mean    : 41.30    Mean    : 19.68    Mean    :    8.579
##    3rd Qu.: 219.7    3rd Qu.: 22.09    3rd Qu.: 0.00    3rd Qu.:    0.000
##    Max.    :36152.9    Max.    :666.73    Max.    :678.62    Max.    :6656.000
##     cost_per_pt         personid.y         cost_rx
##    Min.    :    0.000    Min.    :    1021    Min.    :    0.00
##    1st Qu.: 0.000    1st Qu.:228517    1st Qu.:    0.00
##    Median : 0.000    Median :330408    Median :    0.98
##    Mean    :    5.256    Mean    :394330    Mean    :    60.36
##    3rd Qu.: 0.000    3rd Qu.:534751    3rd Qu.:    10.81
##    Max.    :841.113    Max.    :846140    Max.    :83586.29
##    Community_NonDual_Aged       ccs                    mm
##    Min.    :0.00000          Length:33630       Min.    : 0.4194
##    1st Qu.:0.00000          Class :character    1st Qu.:11.9677
##    Median :0.00000          Mode  :character    Median :23.9677
##    Mean    :0.08488                             Mean    :26.0793
##    3rd Qu.:0.00000                             3rd Qu.:40.9677
##    Max.    :9.53700                             Max.    :47.9677
##        hcc
##    Min.    :0.00000
```

```
##   1st Qu.:0.00000
##   Median :0.00000
##   Mean   :0.08488
##   3rd Qu.:0.00000
##   Max.   :9.53700
```

```
spacex_dat_nomiss2 = spacex_dat_nomiss2 %>%
  mutate(diag1=replace_na(diag1,0),
         zip = replace_na(zip,0),
         ccs = replace_na(ccs,0))

spacex_dat_nomiss2 = as.data.frame(spacex_dat_nomiss2)

start_time <- Sys.time()

set.seed(1)
mod_match2 <- matchit(om_flag ~ age + female + ccs + hcc + mm ,
                      method = "nearest", data = spacex_dat_nomiss2, caliper = .10)
end_time <- Sys.time()

end_time - start_time
```

```
## Time difference of 32.49766 secs
```

```
mod_match2
```

```
##
## Call:
## matchit(formula = om_flag ~ age + female + ccs + hcc + mm, data = spacex_dat_nomiss2,
##     method = "nearest", caliper = 0.1)
##
## Sample sizes:
##           Control Treated
## All         31497    2133
## Matched      1677    1677
## Unmatched   29820     456
## Discarded       0       0
```

```
dta_m2 <- match.data(mod_match2)
dim(dta_m2)
```

```
## [1] 3354    52
```

```
dta_m2 %>%
  group_by(om_flag) %>%
  select(one_of(spacex_dat_cov)) %>%
  summarise_all(funs(mean))
```

```
## # A tibble: 2 x 9
##   om_flag   age female    mm membermo    hcc   ccs diag1   zip
##     <dbl> <dbl>  <dbl> <dbl>    <dbl>  <dbl> <dbl> <dbl> <dbl>
## 1       0  30.2  0.177  31.1     31.1 0.0846    NA    NA    NA
## 2       1  30.5  0.182  31.4     31.4 0.0787    NA    NA    NA
```

```
print(CreateTableOne(vars = c("age", "female", "hcc", "mm", "ccs", "zip"), strata = "om_
flag", data = dta_m2, test = T), smd = TRUE, noSpaces = TRUE)
```

```
##                   Stratified by om_flag
##                    0              1              p      test SMD
##   n                1677           1677
##   age (mean (SD))  30.16 (14.59)  30.49 (8.62)   0.419      0.028
##   female = TRUE (%) 297 (17.7)    305 (18.2)     0.753      0.012
##   hcc (mean (SD))  0.08 (0.25)    0.08 (0.19)    0.443      0.026
##   mm (mean (SD))   31.08 (14.83)  31.41 (14.43)  0.514      0.023
##   ccs (%)                                        1.000      0.218
##      0             2 (0.1)        0 (0.0)
##      10            215 (12.8)     220 (13.1)
##      102           20 (1.2)       20 (1.2)
##      106           12 (0.7)       14 (0.8)
##      117           3 (0.2)        3 (0.2)
##      122           1 (0.1)        1 (0.1)
##      123           9 (0.5)        7 (0.4)
##      124           4 (0.2)        3 (0.2)
##      125           8 (0.5)        9 (0.5)
##      126           32 (1.9)       44 (2.6)
##      127           2 (0.1)        2 (0.1)
##      128           3 (0.2)        6 (0.4)
##      133           17 (1.0)       14 (0.8)
##      134           12 (0.7)       15 (0.9)
##      137           4 (0.2)        2 (0.1)
##      138           0 (0.0)        1 (0.1)
##      140           3 (0.2)        2 (0.1)
##      141           2 (0.1)        3 (0.2)
##      142           2 (0.1)        1 (0.1)
##      143           3 (0.2)        5 (0.3)
##      147           2 (0.1)        2 (0.1)
##      151           4 (0.2)        3 (0.2)
##      154           4 (0.2)        4 (0.2)
##      155           19 (1.1)       14 (0.8)
##      156           0 (0.0)        1 (0.1)
##      158           3 (0.2)        1 (0.1)
##      159           7 (0.4)        8 (0.5)
##      160           3 (0.2)        3 (0.2)
##      163           25 (1.5)       24 (1.4)
##      164           1 (0.1)        1 (0.1)
##      165           5 (0.3)        3 (0.2)
##      166           13 (0.8)       8 (0.5)
##      167           3 (0.2)        7 (0.4)
##      168           3 (0.2)        2 (0.1)
##      171           5 (0.3)        6 (0.4)
##      175           1 (0.1)        2 (0.1)
##      176           5 (0.3)        7 (0.4)
##      181           2 (0.1)        1 (0.1)
##      196           3 (0.2)        3 (0.2)
##      197           11 (0.7)       8 (0.5)
##      198           5 (0.3)        7 (0.4)
##      2             2 (0.1)        1 (0.1)
##      200           29 (1.7)       27 (1.6)
##      202           1 (0.1)        1 (0.1)
##      203           0 (0.0)        1 (0.1)
```

```
## 204          79 (4.7)     77 (4.6)
## 205          99 (5.9)     98 (5.8)
## 209          4 (0.2)      4 (0.2)
## 211          59 (3.5)     55 (3.3)
## 212          12 (0.7)     14 (0.8)
## 213          3 (0.2)      2 (0.1)
## 225          7 (0.4)      5 (0.3)
## 229          1 (0.1)      4 (0.2)
## 23           2 (0.1)      1 (0.1)
## 230          2 (0.1)      3 (0.2)
## 232          28 (1.7)     32 (1.9)
## 234          0 (0.0)      1 (0.1)
## 235          5 (0.3)      5 (0.3)
## 236          6 (0.4)      10 (0.6)
## 239          9 (0.5)      8 (0.5)
## 240          1 (0.1)      1 (0.1)
## 244          8 (0.5)      6 (0.4)
## 245          5 (0.3)      3 (0.2)
## 246          8 (0.5)      8 (0.5)
## 247          1 (0.1)      2 (0.1)
## 250          5 (0.3)      7 (0.4)
## 251          30 (1.8)     27 (1.6)
## 252          19 (1.1)     16 (1.0)
## 253          12 (0.7)     9 (0.5)
## 255          3 (0.2)      4 (0.2)
## 256          408 (24.3)   431 (25.7)
## 257          2 (0.1)      1 (0.1)
## 258          23 (1.4)     25 (1.5)
## 259          19 (1.1)     20 (1.2)
## 29           1 (0.1)      1 (0.1)
## 4            8 (0.5)      10 (0.6)
## 44           3 (0.2)      2 (0.1)
## 47           8 (0.5)      10 (0.6)
## 48           9 (0.5)      4 (0.2)
## 49           15 (0.9)     16 (1.0)
## 5            3 (0.2)      1 (0.1)
## 50           1 (0.1)      1 (0.1)
## 51           3 (0.2)      4 (0.2)
## 53           5 (0.3)      6 (0.4)
## 54           3 (0.2)      2 (0.1)
## 55           2 (0.1)      2 (0.1)
## 58           8 (0.5)      9 (0.5)
## 59           3 (0.2)      3 (0.2)
## 6            0 (0.0)      1 (0.1)
## 62           2 (0.1)      3 (0.2)
## 650          7 (0.4)      9 (0.5)
## 651          30 (1.8)     32 (1.9)
## 652          13 (0.8)     9 (0.5)
## 657          27 (1.6)     25 (1.5)
## 660          8 (0.5)      7 (0.4)
## 661          4 (0.2)      2 (0.1)
## 670          2 (0.1)      1 (0.1)
## 7            11 (0.7)     14 (0.8)
## 81           1 (0.1)      1 (0.1)
```

```
##      84              22 (1.3)        19 (1.1)
##      87               3 (0.2)         3 (0.2)
##      90               9 (0.5)         7 (0.4)
##      91               7 (0.4)         7 (0.4)
##      92              11 (0.7)         7 (0.4)
##      93              17 (1.0)        15 (0.9)
##      94              21 (1.3)        15 (0.9)
##      95              16 (1.0)        12 (0.7)
##      96               4 (0.2)         2 (0.1)
##      98              20 (1.2)        19 (1.1)
##   zip (%)                                           <0.001      2.459
##      00802            0 (0.0)         1 (0.1)
##      01440            0 (0.0)         1 (0.1)
##      01776            0 (0.0)         1 (0.1)
##      02163            0 (0.0)         1 (0.1)
##      02364            0 (0.0)         1 (0.1)
##      02445            0 (0.0)         1 (0.1)
##      04401            0 (0.0)         1 (0.1)
##      06248            2 (0.1)         0 (0.0)
##      07626            0 (0.0)         1 (0.1)
##      07717            0 (0.0)         1 (0.1)
##      07726            0 (0.0)         1 (0.1)
##      07747            0 (0.0)         1 (0.1)
##      08540            0 (0.0)         1 (0.1)
##      08559            0 (0.0)         1 (0.1)
##      08857            0 (0.0)         1 (0.1)
##      10530            0 (0.0)         1 (0.1)
##      11217            0 (0.0)         1 (0.1)
##      11232            1 (0.1)         0 (0.0)
##      11724            0 (0.0)         1 (0.1)
##      11754            0 (0.0)         1 (0.1)
##      11797            0 (0.0)         1 (0.1)
##      12534            0 (0.0)         1 (0.1)
##      13045            0 (0.0)         1 (0.1)
##      14072            0 (0.0)         1 (0.1)
##      14127            0 (0.0)         1 (0.1)
##      15224            1 (0.1)         0 (0.0)
##      18508            0 (0.0)         1 (0.1)
##      18976            0 (0.0)         2 (0.1)
##      19001            0 (0.0)         1 (0.1)
##      19047            0 (0.0)         1 (0.1)
##      19426            1 (0.1)         0 (0.0)
##      19518            0 (0.0)         1 (0.1)
##      20002            0 (0.0)         1 (0.1)
##      20782            0 (0.0)         1 (0.1)
##      21146            0 (0.0)         1 (0.1)
##      22015            0 (0.0)         1 (0.1)
##      22046            0 (0.0)         2 (0.1)
##      22101            1 (0.1)         0 (0.0)
##      22203            2 (0.1)         2 (0.1)
##      22556            0 (0.0)         1 (0.1)
##      27518            0 (0.0)         1 (0.1)
##      27707            1 (0.1)         0 (0.0)
##      28394            0 (0.0)         1 (0.1)
```

```
##       29642        1  (0.1)        0  (0.0)
##       29707        0  (0.0)        1  (0.1)
##       30005        0  (0.0)        1  (0.1)
##       30107        0  (0.0)        1  (0.1)
##       30215        0  (0.0)        1  (0.1)
##       30528        1  (0.1)        0  (0.0)
##       30720        0  (0.0)        1  (0.1)
##       31401        2  (0.1)        1  (0.1)
##       32065        2  (0.1)        0  (0.0)
##       32128        0  (0.0)        1  (0.1)
##       32168        2  (0.1)        0  (0.0)
##       32547        1  (0.1)        0  (0.0)
##       32754        6  (0.4)        0  (0.0)
##       32779        0  (0.0)        1  (0.1)
##       32780       11  (0.7)        1  (0.1)
##       32796        6  (0.4)        0  (0.0)
##       32832        0  (0.0)        1  (0.1)
##       32901        2  (0.1)        1  (0.1)
##       32909        3  (0.2)        0  (0.0)
##       32920        2  (0.1)        0  (0.0)
##       32922        1  (0.1)        0  (0.0)
##       32926        4  (0.2)        0  (0.0)
##       32927       14  (0.8)        0  (0.0)
##       32931        3  (0.2)        1  (0.1)
##       32934        6  (0.4)        0  (0.0)
##       32935        3  (0.2)        0  (0.0)
##       32940        0  (0.0)        1  (0.1)
##       32952        7  (0.4)        3  (0.2)
##       32953       11  (0.7)        0  (0.0)
##       32955        1  (0.1)        2  (0.1)
##       32960        1  (0.1)        0  (0.0)
##       33186        0  (0.0)        1  (0.1)
##       33433        0  (0.0)        1  (0.1)
##       33710        0  (0.0)        1  (0.1)
##       33837        1  (0.1)        0  (0.0)
##       33950        0  (0.0)        1  (0.1)
##       34771        2  (0.1)        0  (0.0)
##       34772        0  (0.0)        1  (0.1)
##       35215        0  (0.0)        1  (0.1)
##       37135        0  (0.0)        1  (0.1)
##       37167        7  (0.4)        0  (0.0)
##       37207        0  (0.0)        1  (0.1)
##       40509        2  (0.1)        0  (0.0)
##       42759        0  (0.0)        1  (0.1)
##       43560        0  (0.0)        1  (0.1)
##       44094        0  (0.0)        1  (0.1)
##       45040        0  (0.0)        2  (0.1)
##       45069        0  (0.0)        1  (0.1)
##       45157        0  (0.0)        1  (0.1)
##       45322        1  (0.1)        0  (0.0)
##       46037        0  (0.0)        1  (0.1)
##       46580        0  (0.0)        1  (0.1)
##       46845        0  (0.0)        1  (0.1)
##       47906        0  (0.0)        1  (0.1)
```

```
##       48025          1 (0.1)        0 (0.0)
##       48044          0 (0.0)        1 (0.1)
##       48098          0 (0.0)        1 (0.1)
##       48642          0 (0.0)        2 (0.1)
##       49684          1 (0.1)        2 (0.1)
##       49770          0 (0.0)        1 (0.1)
##       52246          0 (0.0)        2 (0.1)
##       53186          0 (0.0)        1 (0.1)
##       53527          0 (0.0)        1 (0.1)
##       53711          0 (0.0)        1 (0.1)
##       55126          0 (0.0)        1 (0.1)
##       55410          0 (0.0)        1 (0.1)
##       57104          0 (0.0)        1 (0.1)
##       60047          0 (0.0)        1 (0.1)
##       60048          2 (0.1)        2 (0.1)
##       60062          0 (0.0)        1 (0.1)
##       60148          0 (0.0)        1 (0.1)
##       60201          1 (0.1)        0 (0.0)
##       60555          0 (0.0)        1 (0.1)
##       60565          0 (0.0)        1 (0.1)
##       66227          0 (0.0)        1 (0.1)
##       68118          0 (0.0)        1 (0.1)
##       73012          0 (0.0)        1 (0.1)
##       75006          1 (0.1)        1 (0.1)
##       75010          1 (0.1)        3 (0.2)
##       75149          7 (0.4)        0 (0.0)
##       76034          0 (0.0)        1 (0.1)
##       76502          4 (0.2)        1 (0.1)
##       76513          9 (0.5)        0 (0.0)
##       76522          2 (0.1)        0 (0.0)
##       76528          2 (0.1)        0 (0.0)
##       76537          1 (0.1)        0 (0.0)
##       76542          3 (0.2)        0 (0.0)
##       76557          2 (0.1)        0 (0.0)
##       76561          2 (0.1)        0 (0.0)
##       76566          1 (0.1)        0 (0.0)
##       76638          4 (0.2)        0 (0.0)
##       76643         10 (0.6)        2 (0.1)
##       76655          1 (0.1)        0 (0.0)
##       76657          7 (0.4)        0 (0.0)
##       76702          0 (0.0)        2 (0.1)
##       76706          8 (0.5)        0 (0.0)
##       76708          1 (0.1)        0 (0.0)
##       76710          1 (0.1)        0 (0.0)
##       76712         13 (0.8)        0 (0.0)
##       77005          0 (0.0)        1 (0.1)
##       77007          1 (0.1)        0 (0.0)
##       77088          0 (0.0)        1 (0.1)
##       77089          0 (0.0)        2 (0.1)
##       77494          1 (0.1)        1 (0.1)
##       77573          0 (0.0)        1 (0.1)
##       78415          2 (0.1)        0 (0.0)
##       78520          0 (0.0)        1 (0.1)
##       78521          3 (0.2)        2 (0.1)
```

```
##     78566       4 (0.2)       0 (0.0)
##     78626       0 (0.0)       1 (0.1)
##     78660       2 (0.1)       0 (0.0)
##     78681       2 (0.1)       1 (0.1)
##     78704       1 (0.1)       0 (0.0)
##     78729       0 (0.0)       1 (0.1)
##     78737       1 (0.1)       0 (0.0)
##     78746       1 (0.1)       0 (0.0)
##     78749       0 (0.0)       1 (0.1)
##     80111       0 (0.0)       1 (0.1)
##     80202       0 (0.0)       2 (0.1)
##     80301       0 (0.0)       1 (0.1)
##     80303       0 (0.0)       1 (0.1)
##     80305       0 (0.0)       1 (0.1)
##     80829       0 (0.0)       1 (0.1)
##     80917       0 (0.0)       1 (0.1)
##     81023       0 (0.0)       1 (0.1)
##     84014       0 (0.0)       1 (0.1)
##     84015       0 (0.0)       1 (0.1)
##     85006       0 (0.0)       1 (0.1)
##     85132       0 (0.0)       1 (0.1)
##     85202       0 (0.0)       1 (0.1)
##     85226       0 (0.0)       1 (0.1)
##     85251       3 (0.2)       1 (0.1)
##     85296       0 (0.0)       1 (0.1)
##     85303       0 (0.0)       1 (0.1)
##     85323       0 (0.0)       1 (0.1)
##     85338       0 (0.0)       4 (0.2)
##     85353       0 (0.0)       1 (0.1)
##     87120       1 (0.1)       0 (0.0)
##     88201       1 (0.1)       0 (0.0)
##     89108       0 (0.0)       1 (0.1)
##     89451       1 (0.1)       0 (0.0)
##     90001       0 (0.0)       4 (0.2)
##     90002       3 (0.2)       1 (0.1)
##     90003       0 (0.0)       1 (0.1)
##     90004       1 (0.1)       0 (0.0)
##     90005       0 (0.0)       7 (0.4)
##     90006       0 (0.0)       2 (0.1)
##     90007       0 (0.0)       1 (0.1)
##     90008       3 (0.2)       2 (0.1)
##     90011       0 (0.0)       1 (0.1)
##     90012       0 (0.0)       3 (0.2)
##     90013       1 (0.1)      12 (0.7)
##     90014       0 (0.0)       5 (0.3)
##     90015       1 (0.1)      11 (0.7)
##     90016       1 (0.1)       3 (0.2)
##     90017       0 (0.0)       7 (0.4)
##     90018       0 (0.0)       2 (0.1)
##     90019      17 (1.0)       5 (0.3)
##     90020       0 (0.0)       1 (0.1)
##     90022       2 (0.1)       1 (0.1)
##     90024       0 (0.0)       5 (0.3)
##     90025       2 (0.1)      16 (1.0)
```

```
##      90026          0 (0.0)          5 (0.3)
##      90027          0 (0.0)          3 (0.2)
##      90028          2 (0.1)          3 (0.2)
##      90029          3 (0.2)          0 (0.0)
##      90032          0 (0.0)          1 (0.1)
##      90033          0 (0.0)          1 (0.1)
##      90034          3 (0.2)         19 (1.1)
##      90035          0 (0.0)          3 (0.2)
##      90036          0 (0.0)          4 (0.2)
##      90037          1 (0.1)          4 (0.2)
##      90039         12 (0.7)          7 (0.4)
##      90041          3 (0.2)          2 (0.1)
##      90042          0 (0.0)          4 (0.2)
##      90043          1 (0.1)          2 (0.1)
##      90044          1 (0.1)          3 (0.2)
##      90045          7 (0.4)         24 (1.4)
##      90046          0 (0.0)          2 (0.1)
##      90047          1 (0.1)          5 (0.3)
##      90048          0 (0.0)          2 (0.1)
##      90049         37 (2.2)          4 (0.2)
##      90056          0 (0.0)          1 (0.1)
##      90057          0 (0.0)          1 (0.1)
##      90059          1 (0.1)          2 (0.1)
##      90061          0 (0.0)          2 (0.1)
##      90064          0 (0.0)          6 (0.4)
##      90065          4 (0.2)          3 (0.2)
##      90066          1 (0.1)         23 (1.4)
##      90069          9 (0.5)          0 (0.0)
##      90094          0 (0.0)          7 (0.4)
##      90201         10 (0.6)          2 (0.1)
##      90210          2 (0.1)          0 (0.0)
##      90220          5 (0.3)          9 (0.5)
##      90221          0 (0.0)          2 (0.1)
##      90222          2 (0.1)          1 (0.1)
##      90230          2 (0.1)         17 (1.0)
##      90232          4 (0.2)          9 (0.5)
##      90240          4 (0.2)          3 (0.2)
##      90241          2 (0.1)          2 (0.1)
##      90242          3 (0.2)          2 (0.1)
##      90245         16 (1.0)         41 (2.4)
##      90247          8 (0.5)         18 (1.1)
##      90248          0 (0.0)          1 (0.1)
##      90249         10 (0.6)         11 (0.7)
##      90250         34 (2.0)         85 (5.1)
##      90254         18 (1.1)         70 (4.2)
##      90255          1 (0.1)          0 (0.0)
##      90260         11 (0.7)         30 (1.8)
##      90262          2 (0.1)         11 (0.7)
##      90266          4 (0.2)         34 (2.0)
##      90270         11 (0.7)          2 (0.1)
##      90272          1 (0.1)          0 (0.0)
##      90274          3 (0.2)          6 (0.4)
##      90275          0 (0.0)         12 (0.7)
##      90277          7 (0.4)         47 (2.8)
```

```
##     90278        12 (0.7)        78 (4.7)
##     90280         2 (0.1)         7 (0.4)
##     90291         0 (0.0)        14 (0.8)
##     90292         0 (0.0)        25 (1.5)
##     90293         0 (0.0)        13 (0.8)
##     90301         1 (0.1)         6 (0.4)
##     90302         1 (0.1)         4 (0.2)
##     90303         0 (0.0)         6 (0.4)
##     90304         1 (0.1)         4 (0.2)
##     90305         0 (0.0)         2 (0.1)
##     90401         0 (0.0)         5 (0.3)
##     90403         1 (0.1)        11 (0.7)
##     90404         0 (0.0)         8 (0.5)
##     90405         0 (0.0)        11 (0.7)
##     90501         6 (0.4)        21 (1.3)
##     90502         0 (0.0)         5 (0.3)
##     90503         9 (0.5)        30 (1.8)
##     90504         8 (0.5)        29 (1.7)
##     90505         5 (0.3)        11 (0.7)
##     90601         2 (0.1)         5 (0.3)
##     90602         4 (0.2)         0 (0.0)
##     90605         3 (0.2)         3 (0.2)
##     90606         1 (0.1)         0 (0.0)
##     90620         2 (0.1)         3 (0.2)
##     90621         4 (0.2)         3 (0.2)
##     90630         3 (0.2)         4 (0.2)
##     90631         4 (0.2)         6 (0.4)
##     90640         2 (0.1)         5 (0.3)
##     90650         1 (0.1)         9 (0.5)
##     90660         5 (0.3)         4 (0.2)
##     90670         1 (0.1)         6 (0.4)
##     90680        11 (0.7)         0 (0.0)
##     90701         0 (0.0)         2 (0.1)
##     90703         0 (0.0)         3 (0.2)
##     90706         6 (0.4)        15 (0.9)
##     90710         2 (0.1)         2 (0.1)
##     90712         3 (0.2)        10 (0.6)
##     90713         8 (0.5)         5 (0.3)
##     90715         1 (0.1)         6 (0.4)
##     90717         7 (0.4)         5 (0.3)
##     90720         0 (0.0)         1 (0.1)
##     90723         1 (0.1)         4 (0.2)
##     90731         7 (0.4)        14 (0.8)
##     90732         3 (0.2)         4 (0.2)
##     90744         3 (0.2)         5 (0.3)
##     90745         3 (0.2)        14 (0.8)
##     90746         2 (0.1)         6 (0.4)
##     90802         6 (0.4)        14 (0.8)
##     90803         0 (0.0)         6 (0.4)
##     90804         4 (0.2)         8 (0.5)
##     90805         9 (0.5)        16 (1.0)
##     90806         1 (0.1)         6 (0.4)
##     90807         0 (0.0)         7 (0.4)
##     90808         2 (0.1)         4 (0.2)
```

```
##     90810         1 (0.1)        3 (0.2)
##     90813         3 (0.2)        4 (0.2)
##     90814         0 (0.0)        5 (0.3)
##     90815         2 (0.1)        4 (0.2)
##     91001         0 (0.0)        2 (0.1)
##     91006         1 (0.1)        1 (0.1)
##     91007         0 (0.0)        3 (0.2)
##     91011         0 (0.0)        2 (0.1)
##     91016         0 (0.0)        1 (0.1)
##     91030         2 (0.1)        4 (0.2)
##     91042         0 (0.0)        2 (0.1)
##     91104         0 (0.0)        1 (0.1)
##     91107         1 (0.1)        2 (0.1)
##     91202         0 (0.0)        1 (0.1)
##     91205         4 (0.2)        1 (0.1)
##     91206         1 (0.1)        0 (0.0)
##     91208         0 (0.0)        2 (0.1)
##     91302         0 (0.0)        1 (0.1)
##     91303         1 (0.1)        0 (0.0)
##     91304         0 (0.0)        1 (0.1)
##     91306         1 (0.1)        0 (0.0)
##     91307         0 (0.0)        1 (0.1)
##     91316         0 (0.0)        1 (0.1)
##     91320         1 (0.1)        1 (0.1)
##     91321         0 (0.0)        1 (0.1)
##     91325         0 (0.0)        2 (0.1)
##     91331         0 (0.0)        2 (0.1)
##     91335         1 (0.1)        0 (0.0)
##     91340         0 (0.0)        1 (0.1)
##     91342         3 (0.2)        0 (0.0)
##     91343         3 (0.2)        7 (0.4)
##     91344         0 (0.0)        2 (0.1)
##     91345         0 (0.0)        1 (0.1)
##     91350         0 (0.0)        1 (0.1)
##     91351         1 (0.1)        2 (0.1)
##     91360         0 (0.0)        2 (0.1)
##     91362         4 (0.2)        4 (0.2)
##     91364         1 (0.1)        2 (0.1)
##     91367         2 (0.1)        1 (0.1)
##     91384         0 (0.0)        1 (0.1)
##     91387         1 (0.1)        0 (0.0)
##     91390         0 (0.0)        1 (0.1)
##     91401         0 (0.0)        1 (0.1)
##     91402         0 (0.0)        1 (0.1)
##     91405         0 (0.0)        1 (0.1)
##     91406         1 (0.1)        2 (0.1)
##     91423         0 (0.0)        4 (0.2)
##     91436         0 (0.0)        2 (0.1)
##     91501         1 (0.1)        1 (0.1)
##     91505         1 (0.1)        1 (0.1)
##     91510         0 (0.0)        1 (0.1)
##     91604         0 (0.0)        2 (0.1)
##     91606         0 (0.0)        1 (0.1)
##     91607         0 (0.0)        2 (0.1)
```

```
##     91701            0 (0.0)        2 (0.1)
##     91702            2 (0.1)        0 (0.0)
##     91706            2 (0.1)        1 (0.1)
##     91709            9 (0.5)        2 (0.1)
##     91710            3 (0.2)        1 (0.1)
##     91722            0 (0.0)        1 (0.1)
##     91730            7 (0.4)        0 (0.0)
##     91731            1 (0.1)        0 (0.0)
##     91732            5 (0.3)        1 (0.1)
##     91733            1 (0.1)        0 (0.0)
##     91739            1 (0.1)        0 (0.0)
##     91740            0 (0.0)        2 (0.1)
##     91745            0 (0.0)        8 (0.5)
##     91746            3 (0.2)        1 (0.1)
##     91748            1 (0.1)        1 (0.1)
##     91750            0 (0.0)        1 (0.1)
##     91752            3 (0.2)        0 (0.0)
##     91754            4 (0.2)        3 (0.2)
##     91761            7 (0.4)        1 (0.1)
##     91762            1 (0.1)        0 (0.0)
##     91763            1 (0.1)        0 (0.0)
##     91764            2 (0.1)        2 (0.1)
##     91765            0 (0.0)        8 (0.5)
##     91766            5 (0.3)        0 (0.0)
##     91767            0 (0.0)        1 (0.1)
##     91768            0 (0.0)        3 (0.2)
##     91770            0 (0.0)        2 (0.1)
##     91773            0 (0.0)        1 (0.1)
##     91776            0 (0.0)        1 (0.1)
##     91780            1 (0.1)        1 (0.1)
##     91789           10 (0.6)        0 (0.0)
##     91790            1 (0.1)        2 (0.1)
##     91791            0 (0.0)        1 (0.1)
##     91801            0 (0.0)        2 (0.1)
##     91802            2 (0.1)        0 (0.0)
##     91803            0 (0.0)        2 (0.1)
##     91902            8 (0.5)        0 (0.0)
##     91942            1 (0.1)        1 (0.1)
##     91945            0 (0.0)        1 (0.1)
##     92007            0 (0.0)        1 (0.1)
##     92009           23 (1.4)        1 (0.1)
##     92019            6 (0.4)        0 (0.0)
##     92025            0 (0.0)        1 (0.1)
##     92037            0 (0.0)        2 (0.1)
##     92056            1 (0.1)        0 (0.0)
##     92058            1 (0.1)        0 (0.0)
##     92069            9 (0.5)        0 (0.0)
##     92083            0 (0.0)        1 (0.1)
##     92106            0 (0.0)        1 (0.1)
##     92109           16 (1.0)        2 (0.1)
##     92119            8 (0.5)        1 (0.1)
##     92122            0 (0.0)        1 (0.1)
##     92127            0 (0.0)        1 (0.1)
##     92129           28 (1.7)        1 (0.1)
```

```
##     92139        3 (0.2)       0 (0.0)
##     92307        3 (0.2)       2 (0.1)
##     92320        0 (0.0)       1 (0.1)
##     92335        2 (0.1)       1 (0.1)
##     92336        1 (0.1)       1 (0.1)
##     92337        1 (0.1)       0 (0.0)
##     92345        0 (0.0)       2 (0.1)
##     92346        0 (0.0)       1 (0.1)
##     92359        2 (0.1)       0 (0.0)
##     92375        1 (0.1)       0 (0.0)
##     92382        0 (0.0)       1 (0.1)
##     92385        0 (0.0)       1 (0.1)
##     92395        1 (0.1)       0 (0.0)
##     92505        0 (0.0)       1 (0.1)
##     92507        2 (0.1)       0 (0.0)
##     92509        4 (0.2)       0 (0.0)
##     92530        0 (0.0)       2 (0.1)
##     92532        5 (0.3)       4 (0.2)
##     92545        2 (0.1)       0 (0.0)
##     92553        0 (0.0)       1 (0.1)
##     92555        0 (0.0)       2 (0.1)
##     92557        0 (0.0)       1 (0.1)
##     92562        3 (0.2)       3 (0.2)
##     92563        2 (0.1)       0 (0.0)
##     92570        0 (0.0)       2 (0.1)
##     92571        1 (0.1)       0 (0.0)
##     92584        0 (0.0)       2 (0.1)
##     92586        0 (0.0)       1 (0.1)
##     92591        0 (0.0)       1 (0.1)
##     92602        2 (0.1)       0 (0.0)
##     92604        1 (0.1)       1 (0.1)
##     92612        0 (0.0)       1 (0.1)
##     92614        0 (0.0)       2 (0.1)
##     92618        7 (0.4)       1 (0.1)
##     92619        5 (0.3)       0 (0.0)
##     92620        2 (0.1)       3 (0.2)
##     92625        1 (0.1)       3 (0.2)
##     92626        0 (0.0)       1 (0.1)
##     92629        6 (0.4)       0 (0.0)
##     92630        0 (0.0)       1 (0.1)
##     92646        3 (0.2)       3 (0.2)
##     92647        3 (0.2)       4 (0.2)
##     92648        1 (0.1)       2 (0.1)
##     92649       10 (0.6)       7 (0.4)
##     92651        0 (0.0)       1 (0.1)
##     92656        0 (0.0)       2 (0.1)
##     92660        2 (0.1)       0 (0.0)
##     92673        0 (0.0)       1 (0.1)
##     92677        3 (0.2)       3 (0.2)
##     92679       52 (3.1)       0 (0.0)
##     92683       12 (0.7)       5 (0.3)
##     92691        0 (0.0)       1 (0.1)
##     92692        0 (0.0)       2 (0.1)
##     92694        0 (0.0)       2 (0.1)
```

```
##     92703          2 (0.1)        1 (0.1)
##     92704          3 (0.2)        0 (0.0)
##     92706          1 (0.1)        1 (0.1)
##     92708         10 (0.6)        3 (0.2)
##     92780          1 (0.1)        0 (0.0)
##     92782          1 (0.1)        0 (0.0)
##     92801          2 (0.1)        3 (0.2)
##     92802          0 (0.0)        1 (0.1)
##     92804          3 (0.2)       11 (0.7)
##     92805          3 (0.2)        3 (0.2)
##     92806          0 (0.0)        5 (0.3)
##     92807          5 (0.3)        1 (0.1)
##     92821          6 (0.4)        0 (0.0)
##     92823          0 (0.0)        1 (0.1)
##     92831          0 (0.0)        2 (0.1)
##     92833          6 (0.4)       13 (0.8)
##     92834          0 (0.0)        1 (0.1)
##     92835          0 (0.0)        4 (0.2)
##     92840          3 (0.2)        2 (0.1)
##     92841          3 (0.2)        0 (0.0)
##     92843          2 (0.1)        0 (0.0)
##     92844         12 (0.7)        4 (0.2)
##     92860          2 (0.1)        1 (0.1)
##     92865          1 (0.1)        0 (0.0)
##     92867          0 (0.0)        3 (0.2)
##     92869         22 (1.3)        0 (0.0)
##     92870          0 (0.0)        4 (0.2)
##     92879          8 (0.5)        0 (0.0)
##     92880          2 (0.1)        2 (0.1)
##     92881          1 (0.1)        1 (0.1)
##     92882          4 (0.2)        2 (0.1)
##     92883          1 (0.1)        3 (0.2)
##     93010          3 (0.2)        1 (0.1)
##     93021          0 (0.0)        2 (0.1)
##     93065          8 (0.5)        2 (0.1)
##     93105          0 (0.0)        1 (0.1)
##     93109          1 (0.1)        0 (0.0)
##     93222          1 (0.1)        0 (0.0)
##     93309          1 (0.1)        4 (0.2)
##     93436          9 (0.5)        2 (0.1)
##     93444          2 (0.1)        0 (0.0)
##     93449          2 (0.1)        0 (0.0)
##     93454          0 (0.0)        1 (0.1)
##     93455          1 (0.1)        0 (0.0)
##     93456          1 (0.1)        0 (0.0)
##     93536          3 (0.2)        3 (0.2)
##     93550          0 (0.0)        1 (0.1)
##     93552          1 (0.1)        1 (0.1)
##     93555          0 (0.0)        1 (0.1)
##     93591          0 (0.0)        1 (0.1)
##     93619          1 (0.1)        0 (0.0)
##     94010          0 (0.0)        1 (0.1)
##     94019          5 (0.3)        0 (0.0)
##     94025          0 (0.0)        1 (0.1)
```

```
##     94039         1 (0.1)       0 (0.0)
##     94043         0 (0.0)       1 (0.1)
##     94063         1 (0.1)       4 (0.2)
##     94089        33 (2.0)       2 (0.1)
##     94103         0 (0.0)       1 (0.1)
##     94109       118 (7.0)       0 (0.0)
##     94110         0 (0.0)       2 (0.1)
##     94115         0 (0.0)       2 (0.1)
##     94117         1 (0.1)       2 (0.1)
##     94119         1 (0.1)       0 (0.0)
##     94127         0 (0.0)       1 (0.1)
##     94129         4 (0.2)       0 (0.0)
##     94401         0 (0.0)       1 (0.1)
##     94509        12 (0.7)       0 (0.0)
##     94519         1 (0.1)       0 (0.0)
##     94539       113 (6.7)       0 (0.0)
##     94542         0 (0.0)       1 (0.1)
##     94549        36 (2.1)       0 (0.0)
##     94559         3 (0.2)       0 (0.0)
##     94563         0 (0.0)       1 (0.1)
##     94566         0 (0.0)       1 (0.1)
##     94579         8 (0.5)       2 (0.1)
##     94589         1 (0.1)       0 (0.0)
##     94591         2 (0.1)       0 (0.0)
##     94609        19 (1.1)       0 (0.0)
##     94611         0 (0.0)       1 (0.1)
##     94619        18 (1.1)       0 (0.0)
##     94709         3 (0.2)       0 (0.0)
##     94806         0 (0.0)       1 (0.1)
##     94903         0 (0.0)       1 (0.1)
##     94939         7 (0.4)       0 (0.0)
##     94949        20 (1.2)       1 (0.1)
##     95009         1 (0.1)       0 (0.0)
##     95014         0 (0.0)       1 (0.1)
##     95019         6 (0.4)       0 (0.0)
##     95051         0 (0.0)       1 (0.1)
##     95060         0 (0.0)       2 (0.1)
##     95119         4 (0.2)       0 (0.0)
##     95120         5 (0.3)       0 (0.0)
##     95128         1 (0.1)       0 (0.0)
##     95129        63 (3.8)       1 (0.1)
##     95138         0 (0.0)       1 (0.1)
##     95139        13 (0.8)       0 (0.0)
##     95206         1 (0.1)       0 (0.0)
##     95209         2 (0.1)       0 (0.0)
##     95219         3 (0.2)       0 (0.0)
##     95361         0 (0.0)       1 (0.1)
##     95377         0 (0.0)       1 (0.1)
##     95401         0 (0.0)       1 (0.1)
##     95409         1 (0.1)       1 (0.1)
##     95667         0 (0.0)       1 (0.1)
##     95669         1 (0.1)       0 (0.0)
##     95746         0 (0.0)       1 (0.1)
##     95812         1 (0.1)       1 (0.1)
```

```
##      95969          2 (0.1)         0 (0.0)
##      96094          0 (0.0)         2 (0.1)
##      97045          0 (0.0)         1 (0.1)
##      97086          0 (0.0)         2 (0.1)
##      97223          0 (0.0)         1 (0.1)
##      98004          0 (0.0)         1 (0.1)
##      98007          0 (0.0)         1 (0.1)
##      98012          1 (0.1)         1 (0.1)
##      98020          0 (0.0)         1 (0.1)
##      98027          2 (0.1)         0 (0.0)
##      98037          0 (0.0)         1 (0.1)
##      98052          2 (0.1)         0 (0.0)
##      98053          0 (0.0)         1 (0.1)
##      98057          0 (0.0)         1 (0.1)
##      98059          1 (0.1)         0 (0.0)
##      98073          1 (0.1)         0 (0.0)
##      98074          1 (0.1)         0 (0.0)
##      98077          2 (0.1)         0 (0.0)
##      98102          2 (0.1)         0 (0.0)
##      98104          1 (0.1)         0 (0.0)
##      98109          1 (0.1)         0 (0.0)
##      98112          0 (0.0)         1 (0.1)
##      98115          2 (0.1)         0 (0.0)
##      98122          2 (0.1)         0 (0.0)
##      98178          1 (0.1)         0 (0.0)
##      98406          1 (0.1)         3 (0.2)
##      99352          0 (0.0)         1 (0.1)
```

```
dta_run2 = dta_m2 %>%
  mutate(logcost_md = log(cost_md+1),
         logcost_er = log(cost_er+1),
         logcost_hosp = log(cost_hosp+1),
         logcost_pcp = log(cost_pcp+1),
         logcost_spec = log(cost_spec+1),
         logcost_mh = log(cost_mh+1),
         logcost_pt = log(cost_pt+1),
         logcost_rx = log(cost_rx+1),
         logcost_drugadmin = log(cost_drugadmin + 1),
         logcost_surg = log(cost_surg+1),
         logcost_maternity = log(cost_maternity+1),
         logcost_labs = log(cost_labs+1),
         logcost_rads = log(cost_rads +1),
         logcount_er = log(count_er+1),
         logcount_hosp = log(count_hosp+1),
         logcount_pcp = log(count_pcp+1),
         logcount_spec = log(count_spec+1),
         logcount_mh = log(count_mh+1),
         logcount_pt = log(count_pt+1),
         logcount_drugadmin = log(count_drugadmin+1),
         logcount_surg = log(count_surg+1),
         logcount_maternity = log(count_maternity+1),
         logcount_labs = log(count_labs+1),
         logcount_rads = log(count_rads+1),
         logcost_per_er = log(cost_per_er+1),
         logcost_per_hosp = log(cost_per_hosp+1),
         logcost_per_pcp = log(cost_per_pcp+1),
         logcost_per_spec = log(cost_per_spec+1),
         logcost_per_mh = log(cost_per_mh+1),
         logcost_per_pt = log(cost_per_pt+1),
         logcost_per_drugadmin = log(cost_per_drugadmin+1),
         logcost_per_surg = log(cost_per_surg+1),
         logcost_per_maternity = log(cost_per_maternity+1),
         logcost_per_labs = log(cost_per_labs+1),
         logcost_per_rads = log(cost_per_rads+1)
  )
```

```
prem2 = spacex_dat_ana2 %>%
  mutate(count_er = 1000*count_er,
         count_hosp = 1000*count_hosp,
         count_pcp = 1000*count_pcp,
         count_spec = 1000*count_spec,
         count_mh = 1000*count_mh,
         count_pt = 1000*count_pt,
         count_drugadmin = 1000*count_drugadmin,
         count_surg = 1000*count_surg,
         count_maternity = 1000*count_maternity,
         count_labs = 1000*count_labs,
         count_rads = 1000*count_rads
  )
pretable2 = CreateTableOne(data =prem2, vars = c("age", "female", "hcc", "mm", "cost_md"
, "cost_rx", "cost_er" ,"cost_hosp" , "cost_pcp"  , "cost_spec"  ,"cost_mh" ,"cost_pt" ,
"cost_drugadmin","cost_surg","cost_maternity","cost_labs","cost_rads", "count_er"   , "co
unt_hosp" ,"count_pcp" ,"count_spec", "count_mh",   "count_pt"  , "count_drugadmin","cou
nt_surg","count_maternity","count_labs","count_rads", "cost_per_er", "cost_per_hosp", "c
ost_per_pcp","cost_per_spec","cost_per_mh","cost_per_pt" ,"cost_per_drugadmin","cost_per
_surg"   ,"cost_per_maternity" ,"cost_per_labs", "cost_per_rads"), strata="om_flag", tes
t = T)
pretab2 = print(pretable2, smd = TRUE, contDigits=3, catDigits=3, noSpaces = TRUE, quote
= T)
```

```
##                                        "Stratified by om_flag"
##    ""                                  "0"
##    "n"                                 "31497"
##    "age (mean (SD))"                   "27.736 (15.611)"
##    "female = TRUE (%)"                 "13294 (42.207)"
##    "hcc (mean (SD))"                   "0.086 (0.329)"
##    "mm (mean (SD))"                    "25.639 (15.481)"
##    "cost_md (mean (SD))"              "251.350 (1764.406)"
##    "cost_rx (mean (SD))"              "61.846 (678.494)"
##    "cost_er (mean (SD))"              "10.192 (104.917)"
##    "cost_hosp (mean (SD))"            "8.689 (388.379)"
##    "cost_pcp (mean (SD))"             "8.853 (42.134)"
##    "cost_spec (mean (SD))"            "4.242 (32.635)"
##    "cost_mh (mean (SD))"              "2.552 (43.986)"
##    "cost_pt (mean (SD))"              "4.003 (44.228)"
##    "cost_drugadmin (mean (SD))"       "3.836 (81.724)"
##    "cost_surg (mean (SD))"            "26.907 (374.411)"
##    "cost_maternity (mean (SD))"       "4.685 (145.639)"
##    "cost_labs (mean (SD))"            "6.350 (58.141)"
##    "cost_rads (mean (SD))"            "8.612 (184.241)"
##    "count_er (mean (SD))"             "29.818 (371.512)"
##    "count_hosp (mean (SD))"           "3.561 (72.628)"
##    "count_pcp (mean (SD))"            "61.557 (337.013)"
##    "count_spec (mean (SD))"           "34.907 (263.193)"
##    "count_mh (mean (SD))"             "13.808 (210.871)"
##    "count_pt (mean (SD))"             "96.059 (993.261)"
##    "count_drugadmin (mean (SD))"      "29.807 (218.979)"
##    "count_surg (mean (SD))"           "33.286 (306.302)"
##    "count_maternity (mean (SD))"      "0.374 (9.480)"
##    "count_labs (mean (SD))"           "155.823 (1062.029)"
##    "count_rads (mean (SD))"           "28.100 (228.548)"
##    "cost_per_er (mean (SD))"          "399.880 (282.575)"
##    "cost_per_hosp (mean (SD))"        "2523.146 (4728.429)"
##    "cost_per_pcp (mean (SD))"         "162.064 (83.700)"
##    "cost_per_spec (mean (SD))"        "133.117 (77.266)"
##    "cost_per_mh (mean (SD))"          "218.756 (416.636)"
##    "cost_per_pt (mean (SD))"          "49.183 (59.171)"
##    "cost_per_drugadmin (mean (SD))" "93.073 (272.002)"
##    "cost_per_surg (mean (SD))"        "543.536 (1815.610)"
##    "cost_per_maternity (mean (SD))" "14136.647 (11650.884)"
##    "cost_per_labs (mean (SD))"        "42.195 (98.518)"
##    "cost_per_rads (mean (SD))"        "227.633 (317.877)"
##                                        "Stratified by om_flag"
##    ""                                  "1"                         "p"        "test"
##    "n"                                 "2133"                      ""          ""
##    "age (mean (SD))"                   "30.534 (8.507)"            "<0.001" ""
##    "female = TRUE (%)"                 "313 (14.674)"              "<0.001" ""
##    "hcc (mean (SD))"                   "0.073 (0.181)"             "0.082"  ""
##    "mm (mean (SD))"                    "32.576 (14.190)"           "<0.001" ""
##    "cost_md (mean (SD))"              "242.266 (544.820)"         "0.813"  ""
##    "cost_rx (mean (SD))"              "38.379 (236.644)"          "0.112"  ""
##    "cost_er (mean (SD))"              "18.781 (100.556)"          "<0.001" ""
##    "cost_hosp (mean (SD))"            "5.490 (89.540)"            "0.704"  ""
```

```
##     "cost_pcp (mean (SD))"         "30.497 (44.041)"        "<0.001" ""
##     "cost_spec (mean (SD))"        "2.890 (6.686)"          "0.056"  ""
##     "cost_mh (mean (SD))"          "7.513 (44.421)"         "<0.001" ""
##     "cost_pt (mean (SD))"          "11.972 (57.973)"        "<0.001" ""
##     "cost_drugadmin (mean (SD))"   "7.739 (81.941)"         "0.033"  ""
##     "cost_surg (mean (SD))"        "14.490 (92.592)"        "0.126"  ""
##     "cost_maternity (mean (SD))"   "0.521 (14.587)"         "0.187"  ""
##     "cost_labs (mean (SD))"        "6.483 (15.508)"         "0.916"  ""
##     "cost_rads (mean (SD))"        "4.918 (29.424)"         "0.355"  ""
##     "count_er (mean (SD))"         "52.485 (224.617)"       "0.005"  ""
##     "count_hosp (mean (SD))"       "2.515 (30.045)"         "0.508"  ""
##     "count_pcp (mean (SD))"        "183.048 (260.268)"      "<0.001" ""
##     "count_spec (mean (SD))"       "22.928 (48.243)"        "0.036"  ""
##     "count_mh (mean (SD))"         "44.754 (255.000)"       "<0.001" ""
##     "count_pt (mean (SD))"         "196.768 (880.441)"      "<0.001" ""
##     "count_drugadmin (mean (SD))"  "81.018 (221.249)"       "<0.001" ""
##     "count_surg (mean (SD))"       "29.243 (98.395)"        "0.544"  ""
##     "count_maternity (mean (SD))"  "0.041 (0.959)"          "0.105"  ""
##     "count_labs (mean (SD))"       "313.709 (529.158)"      "<0.001" ""
##     "count_rads (mean (SD))"       "33.176 (98.687)"        "0.308"  ""
##     "cost_per_er (mean (SD))"      "391.429 (340.019)"      "0.666"  ""
##     "cost_per_hosp (mean (SD))"    "2790.994 (6504.487)"    "0.735"  ""
##     "cost_per_pcp (mean (SD))"     "170.488 (39.527)"       "<0.001" ""
##     "cost_per_spec (mean (SD))"    "125.749 (53.577)"       "0.014"  ""
##     "cost_per_mh (mean (SD))"      "195.408 (322.048)"      "0.361"  ""
##     "cost_per_pt (mean (SD))"      "66.927 (40.084)"        "<0.001" ""
##     "cost_per_drugadmin (mean (SD))" "73.396 (107.004)"     "0.023"  ""
##     "cost_per_surg (mean (SD))"    "350.858 (1548.267)"     "0.019"  ""
##     "cost_per_maternity (mean (SD))" "13319.250 (10574.622)" "0.890" ""
##     "cost_per_labs (mean (SD))"    "25.527 (28.741)"        "<0.001" ""
##     "cost_per_rads (mean (SD))"    "129.231 (190.687)"      "<0.001" ""
##                                    "Stratified by om_flag"
##     ""                             "SMD"
##     "n"                            ""
##     "age (mean (SD))"              "0.223"
##     "female = TRUE (%)"            "0.641"
##     "hcc (mean (SD))"              "0.047"
##     "mm (mean (SD))"               "0.467"
##     "cost_md (mean (SD))"          "0.007"
##     "cost_rx (mean (SD))"          "0.046"
##     "cost_er (mean (SD))"          "0.084"
##     "cost_hosp (mean (SD))"        "0.011"
##     "cost_pcp (mean (SD))"         "0.502"
##     "cost_spec (mean (SD))"        "0.057"
##     "cost_mh (mean (SD))"          "0.112"
##     "cost_pt (mean (SD))"          "0.155"
##     "cost_drugadmin (mean (SD))"   "0.048"
##     "cost_surg (mean (SD))"        "0.046"
##     "cost_maternity (mean (SD))"   "0.040"
##     "cost_labs (mean (SD))"        "0.003"
##     "cost_rads (mean (SD))"        "0.028"
##     "count_er (mean (SD))"         "0.074"
##     "count_hosp (mean (SD))"       "0.019"
##     "count_pcp (mean (SD))"        "0.403"
```

```
##    "count_spec (mean (SD))"        "0.063"
##    "count_mh (mean (SD))"          "0.132"
##    "count_pt (mean (SD))"          "0.107"
##    "count_drugadmin (mean (SD))"   "0.233"
##    "count_surg (mean (SD))"        "0.018"
##    "count_maternity (mean (SD))"   "0.049"
##    "count_labs (mean (SD))"        "0.188"
##    "count_rads (mean (SD))"        "0.029"
##    "cost_per_er (mean (SD))"       "0.027"
##    "cost_per_hosp (mean (SD))"     "0.047"
##    "cost_per_pcp (mean (SD))"      "0.129"
##    "cost_per_spec (mean (SD))"     "0.111"
##    "cost_per_mh (mean (SD))"       "0.063"
##    "cost_per_pt (mean (SD))"       "0.351"
##    "cost_per_drugadmin (mean (SD))" "0.095"
##    "cost_per_surg (mean (SD))"     "0.114"
##    "cost_per_maternity (mean (SD))" "0.073"
##    "cost_per_labs (mean (SD))"     "0.230"
##    "cost_per_rads (mean (SD))"     "0.375"
```

```
postm2 = dta_run2 %>%
  mutate(count_er = 1000*count_er,
         count_hosp = 1000*count_hosp,
         count_pcp = 1000*count_pcp,
         count_spec = 1000*count_spec,
         count_mh = 1000*count_mh,
         count_pt = 1000*count_pt,
         count_drugadmin = 1000*count_drugadmin,
         count_surg = 1000*count_surg,
         count_maternity = 1000*count_maternity,
         count_labs = 1000*count_labs,
         count_rads = 1000*count_rads
  )
posttable2 = CreateTableOne(data =postm2, vars = c("age", "female", "hcc", "mm", "cost_m
d", "cost_rx", "cost_er" ,"cost_hosp" , "cost_pcp"  , "cost_spec"  ,"cost_mh" ,"cost_pt"
,  "cost_drugadmin","cost_surg","cost_maternity","cost_labs","cost_rads", "count_er"   ,
"count_hosp" ,"count_pcp" ,"count_spec", "count_mh",   "count_pt"  , "count_drugadmin",
"count_surg","count_maternity","count_labs","count_rads", "cost_per_er", "cost_per_hosp"
, "cost_per_pcp","cost_per_spec","cost_per_mh","cost_per_pt" ,"cost_per_drugadmin","cost
_per_surg"   ,"cost_per_maternity" ,"cost_per_labs", "cost_per_rads"), strata="om_flag",
test = T)
posttab2 = print(posttable2, smd = TRUE, contDigits=1, catDigits=1, noSpaces = TRUE, quo
te = T)
```

```
##                                   "Stratified by om_flag"
##     ""                            "0"                "1"
##      "n"                          "1677"             "1677"
##     "age (mean (SD))"             "30.2 (14.6)"      "30.5 (8.6)"
##     "female = TRUE (%)"           "297 (17.7)"       "305 (18.2)"
##     "hcc (mean (SD))"             "0.1 (0.3)"        "0.1 (0.2)"
##     "mm (mean (SD))"              "31.1 (14.8)"      "31.4 (14.4)"
##     "cost_md (mean (SD))"         "647.0 (2159.9)"   "247.0 (563.3)"
##     "cost_rx (mean (SD))"         "107.1 (813.5)"    "37.0 (240.3)"
##     "cost_er (mean (SD))"         "38.2 (164.3)"     "22.2 (112.3)"
##     "cost_hosp (mean (SD))"       "32.7 (363.3)"     "4.0 (61.4)"
##     "cost_pcp (mean (SD))"        "29.8 (64.0)"      "30.7 (37.6)"
##     "cost_spec (mean (SD))"       "14.2 (59.0)"      "3.1 (7.1)"
##     "cost_mh (mean (SD))"         "10.5 (92.4)"      "7.6 (39.7)"
##     "cost_pt (mean (SD))"         "13.2 (75.0)"      "11.7 (57.9)"
##     "cost_drugadmin (mean (SD))"  "11.9 (89.0)"      "7.5 (91.4)"
##     "cost_surg (mean (SD))"       "61.6 (423.6)"     "15.0 (94.5)"
##     "cost_maternity (mean (SD))"  "9.2 (250.0)"      "0.4 (12.1)"
##     "cost_labs (mean (SD))"       "14.9 (64.1)"      "6.8 (16.3)"
##     "cost_rads (mean (SD))"       "19.9 (118.0)"     "5.6 (32.8)"
##     "count_er (mean (SD))"        "113.4 (630.7)"    "61.4 (248.8)"
##     "count_hosp (mean (SD))"      "11.2 (90.7)"      "2.8 (33.4)"
##     "count_pcp (mean (SD))"       "194.9 (506.9)"    "184.0 (219.7)"
##     "count_spec (mean (SD))"      "112.0 (477.5)"    "24.2 (50.3)"
##     "count_mh (mean (SD))"        "55.9 (433.9)"     "43.5 (207.2)"
##     "count_pt (mean (SD))"        "316.8 (1810.4)"   "199.7 (902.1)"
##     "count_drugadmin (mean (SD))" "111.4 (340.3)"    "72.5 (162.1)"
##     "count_surg (mean (SD))"      "80.7 (320.4)"     "29.5 (98.2)"
##     "count_maternity (mean (SD))" "0.5 (8.2)"        "0.0 (1.0)"
##     "count_labs (mean (SD))"      "420.9 (1313.2)"   "328.9 (532.1)"
##     "count_rads (mean (SD))"      "73.4 (176.8)"     "35.4 (99.3)"
##     "cost_per_er (mean (SD))"     "287.9 (121.0)"    "282.2 (118.5)"
##     "cost_per_hosp (mean (SD))"   "322.7 (1380.3)"   "200.7 (327.2)"
##     "cost_per_pcp (mean (SD))"    "148.4 (91.9)"     "171.0 (40.9)"
##     "cost_per_spec (mean (SD))"   "84.4 (92.3)"      "43.6 (68.1)"
##     "cost_per_mh (mean (SD))"     "33.0 (160.9)"     "31.2 (158.4)"
##     "cost_per_pt (mean (SD))"     "10.9 (30.9)"      "19.8 (37.1)"
##     "cost_per_drugadmin (mean (SD))" "34.8 (115.6)"  "36.8 (89.6)"
##     "cost_per_surg (mean (SD))"   "255.3 (1738.9)"   "137.8 (902.4)"
##     "cost_per_maternity (mean (SD))" "8785.2 (7278.1)" "7893.0 (6367.8)"
##     "cost_per_labs (mean (SD))"   "30.6 (62.0)"      "21.9 (26.1)"
##     "cost_per_rads (mean (SD))"   "101.3 (225.4)"    "46.2 (122.5)"
##                                   "Stratified by om_flag"
##     ""                            "p"        "test" "SMD"
##      "n"                          ""          ""     ""
##     "age (mean (SD))"             "0.419"    ""     "0.028"
##     "female = TRUE (%)"           "0.753"    ""     "0.012"
##     "hcc (mean (SD))"             "0.443"    ""     "0.026"
##     "mm (mean (SD))"              "0.514"    ""     "0.023"
##     "cost_md (mean (SD))"         "<0.001"   ""     "0.253"
##     "cost_rx (mean (SD))"         "0.001"    ""     "0.117"
##     "cost_er (mean (SD))"         "0.001"    ""     "0.114"
##     "cost_hosp (mean (SD))"       "0.001"    ""     "0.110"
```

```
##     "cost_pcp (mean (SD))"             "0.608"   ""     "0.018"
##     "cost_spec (mean (SD))"            "<0.001"  ""     "0.264"
##     "cost_mh (mean (SD))"              "0.229"   ""     "0.042"
##     "cost_pt (mean (SD))"              "0.507"   ""     "0.023"
##     "cost_drugadmin (mean (SD))"       "0.157"   ""     "0.049"
##     "cost_surg (mean (SD))"            "<0.001"  ""     "0.152"
##     "cost_maternity (mean (SD))"       "0.148"   ""     "0.050"
##     "cost_labs (mean (SD))"            "<0.001"  ""     "0.174"
##     "cost_rads (mean (SD))"            "<0.001"  ""     "0.165"
##     "count_er (mean (SD))"             "0.002"   ""     "0.109"
##     "count_hosp (mean (SD))"           "<0.001"  ""     "0.123"
##     "count_pcp (mean (SD))"            "0.420"   ""     "0.028"
##     "count_spec (mean (SD))"           "<0.001"  ""     "0.258"
##     "count_mh (mean (SD))"             "0.294"   ""     "0.036"
##     "count_pt (mean (SD))"             "0.018"   ""     "0.082"
##     "count_drugadmin (mean (SD))"      "<0.001"  ""     "0.146"
##     "count_surg (mean (SD))"           "<0.001"  ""     "0.216"
##     "count_maternity (mean (SD))"      "0.033"   ""     "0.074"
##     "count_labs (mean (SD))"           "0.008"   ""     "0.092"
##     "count_rads (mean (SD))"           "<0.001"  ""     "0.265"
##     "cost_per_er (mean (SD))"          "0.167"   ""     "0.048"
##     "cost_per_hosp (mean (SD))"        "<0.001"  ""     "0.122"
##     "cost_per_pcp (mean (SD))"         "<0.001"  ""     "0.318"
##     "cost_per_spec (mean (SD))"        "<0.001"  ""     "0.504"
##     "cost_per_mh (mean (SD))"          "0.740"   ""     "0.011"
##     "cost_per_pt (mean (SD))"          "<0.001"  ""     "0.259"
##     "cost_per_drugadmin (mean (SD))"   "0.567"   ""     "0.020"
##     "cost_per_surg (mean (SD))"        "0.014"   ""     "0.085"
##     "cost_per_maternity (mean (SD))"   "<0.001"  ""     "0.130"
##     "cost_per_labs (mean (SD))"        "<0.001"  ""     "0.184"
##     "cost_per_rads (mean (SD))"        "<0.001"  ""     "0.304"
```

# regs

```
glmMatched1_c <- glm(formula = logcost_md ~ om_flag + age + female + mm + hcc + ccs + zi
p ,
                     data    = dta_run2)

glmMatched2_c <- glm(formula = logcost_er ~ om_flag + age + female + mm + hcc + ccs + zi
p ,
                     data    = dta_run2)

glmMatched3_c <- glm(formula = logcost_hosp ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                     data    = dta_run2)

glmMatched4_c <- glm(formula = logcost_pcp ~ om_flag + age + female + mm + hcc + ccs + z
ip ,
                     data    = dta_run2)

glmMatched5_c <- glm(formula = logcost_spec ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                     data    = dta_run2)


glmMatched5a_c <- glm(formula = logcost_mh ~ om_flag + age + female + mm + hcc + ccs+ zi
p  ,
                      data    = dta_run2)


glmMatched5b_c <- glm(formula = logcost_pt ~ om_flag + age + female + mm + hcc + ccs + z
ip ,
                      data    = dta_run2)


glmMatched6_c <- glm(formula = logcost_rx ~ om_flag + age + female + mm + hcc + ccs + zi
p ,
                     data    = dta_run2)


glmMatched6a_c <- glm(formula = logcost_drugadmin ~ om_flag + age + female + mm + hcc +
ccs + zip ,
                      data    = dta_run2)
glmMatched6b_c <- glm(formula = logcost_surg ~ om_flag + age + female + mm + hcc + ccs+
zip  ,
                      data    = dta_run2)
glmMatched6c_c <- glm(formula = logcost_maternity ~ om_flag + age + female + mm + hcc +
ccs+ zip  ,
                      data    = dta_run2)
glmMatched6d_c <- glm(formula = logcost_labs ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                      data    = dta_run2)
glmMatched6e_c <- glm(formula = logcost_rads ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                      data    = dta_run2)
```

```
glmMatched7_c <- glm(formula = logcount_er ~ om_flag + age + female + mm + hcc + ccs + z
ip ,
                     data     = dta_run2)


glmMatched8_c <- glm(formula = logcount_hosp ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                     data     = dta_run2)


glmMatched9_c <- glm(formula = logcount_pcp ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                     data     = dta_run2)

glmMatched10_c <- glm(formula = logcount_spec ~ om_flag + age + female + mm + hcc + ccs+
zip  ,
                      data     = dta_run2)



glmMatched10a_c <- glm(formula = logcount_mh ~ om_flag + age + female + mm + hcc + ccs +
zip ,
                       data     = dta_run2)



glmMatched10b_c <- glm(formula = logcount_pt ~ om_flag + age + female + mm + hcc + ccs+
zip  ,
                       data     = dta_run2)



glmMatched10c_c <- glm(formula = logcount_drugadmin ~ om_flag + age + female + mm + hcc
+ ccs + zip ,
                       data     = dta_run2)
glmMatched10d_c <- glm(formula = logcount_surg ~ om_flag + age + female + mm + hcc + ccs
+ zip ,
                       data     = dta_run2)
glmMatched10e_c <- glm(formula = logcount_maternity ~ om_flag + age + female + mm + hcc
+ ccs + zip ,
                       data     = dta_run2)
glmMatched10f_c <- glm(formula = logcount_labs ~ om_flag + age + female + mm + hcc + ccs
+ zip ,
                       data     = dta_run2)
glmMatched10g_c <- glm(formula = logcount_rads ~ om_flag + age + female + mm + hcc + ccs
+ zip ,
                       data     = dta_run2)



glmMatched11_c <- glm(formula = logcost_per_er ~ om_flag + age + female + mm + hcc + ccs
+ zip ,
                      data     = dta_run2)

glmMatched11b_c <- glm(formula = logcost_per_hosp ~ om_flag + age + female + mm + hcc +
ccs+ zip  ,
```

```
                       data     = dta_run2)

glmMatched11c_c <- glm(formula = logcost_per_pcp ~ om_flag + age + female + mm + hcc + c
cs + zip ,
                       data     = dta_run2)


glmMatched5c_c <- glm(formula = logcost_per_spec ~ om_flag + age + female + mm + hcc + c
cs + zip ,
                       data     = dta_run2)


glmMatched5ca_c <- glm(formula = logcost_per_mh ~ om_flag + age + female + mm + hcc + cc
s + zip ,
                       data     = dta_run2)


glmMatched5cb_c <- glm(formula = logcost_per_pt ~ om_flag + age + female + mm + hcc + cc
s + zip ,
                       data     = dta_run2)


glmMatched5cc_c <- glm(formula = logcost_per_drugadmin ~ om_flag + age + female + mm + h
cc + ccs + zip ,
                       data     = dta_run2)

glmMatched5cd_c <- glm(formula = logcost_per_surg ~ om_flag + age + female + mm + hcc +
ccs + zip ,
                       data     = dta_run2)

glmMatched5ce_c <- glm(formula = logcost_per_maternity ~ om_flag + age + female + mm + h
cc + ccs + zip ,
                       data     = dta_run2)

glmMatched5cf_c <- glm(formula = logcost_per_labs ~ om_flag + age + female + mm + hcc +
ccs+ zip  ,
                       data     = dta_run2)

glmMatched5cg_c <- glm(formula = logcost_per_rads ~ om_flag + age + female + mm + hcc +
ccs + zip ,
                       data     = dta_run2)
```

```
exponentiate_c <- function(x) ((exp(x)-1)*100)


stargazer::stargazer(glmMatched1_c, glmMatched2_c, glmMatched3_c, glmMatched4_c, glmMatc
hed5_c, glmMatched5a_c, glmMatched5b_c, glmMatched6_c,glmMatched6a_c,glmMatched6b_c,glmM
atched6c_c,glmMatched6d_c,glmMatched6e_c,
                     title="Spending",
                     type = "html",
                     keep=c("om_flag","age","female","mm","hcc"),
                     ci=TRUE, ci.level=0.95,
                     apply.coef=exponentiate, apply.se = exponentiate,
                     digits = 1,
                     star.cutoffs = c(0.05, 0.01, 0.001),
                     column.labels = c("Total Spend", "Emergency", "Hospital", "Primary
 Care", "Specialist", "Mental Health", "Physical Therapy", "Rx", "Drug admin", "Surgery"
, "Maternity", "Labs", "Radiology"),
                     out = "table1c.htm")
```

```
##
## <table style="text-align:center"><caption><strong>Spending</strong></caption>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"></td><td colspan="13"><em>Dependent variable:</em></td></tr>
## <tr><td></td><td colspan="13" style="border-bottom: 1px solid black"></td></tr>
## <tr><td style="text-align:left"></td><td>logcost_md</td><td>logcost_er</td><td>logcos
t_hosp</td><td>logcost_pcp</td><td>logcost_spec</td><td>logcost_mh</td><td>logcost_pt</t
d><td>logcost_rx</td><td>logcost_drugadmin</td><td>logcost_surg</td><td>logcost_maternit
y</td><td>logcost_labs</td><td>logcost_rads</td></tr>
## <tr><td style="text-align:left"></td><td>Total Spend</td><td>Emergency</td><td>Hospit
al</td><td>Primary Care</td><td>Specialist</td><td>Mental Health</td><td>Physical Therap
y</td><td>Rx</td><td>Drug admin</td><td>Surgery</td><td>Maternity</td><td>Labs</td><td>R
adiology</td></tr>
## <tr><td style="text-align:left"></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td>
<td>(5)</td><td>(6)</td><td>(7)</td><td>(8)</td><td>(9)</td><td>(10)</td><td>(11)</td><t
d>(12)</td><td>(13)</td></tr>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">om_flag</td><td>-32.4<sup>***</sup></td><td>-19.9<sup>*</sup></td><td
>-17.3<sup>***</sup></td><td>50.9<sup>***</sup></td><td>-58.3<sup>***</sup></td><td>-11.
6<sup>*</sup></td><td>40.3<sup>***</sup></td><td>-37.1<sup>***</sup></td><td>-8.0</td><t
d>-39.6<sup>***</sup></td><td>-2.1</td><td>-29.5<sup>***</sup></td><td>-48.2<sup>***</su
p></td></tr>
## <tr><td style="text-align:left"></td><td>(-45.4, -19.4)</td><td>(-36.3, -3.4)</td><td
>(-26.2, -8.3)</td><td>(40.5, 61.2)</td><td>(-71.4, -45.3)</td><td>(-22.6, -0.5)</td><td
>(27.9, 52.6)</td><td>(-55.8, -18.4)</td><td>(-20.5, 4.6)</td><td>(-55.8, -23.4)</td><td
>(-5.5, 1.4)</td><td>(-42.8, -16.3)</td><td>(-62.4, -33.9)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">age</td><td>0.5<sup>**</sup></td><td>0.2</td><td>-0.2
</td><td>-0.6<sup>***</sup></td><td>0.7<sup>***</sup></td><td>0.3</td><td>0.1</td><td>1.
3<sup>***</sup></td><td>-1.3<sup>***</sup></td><td>1.1<sup>***</sup></td><td>0.1</td><td
>1.2<sup>***</sup></td><td>0.8<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(0.1, 0.9)</td><td>(-0.3, 0.7)</td><td>(-0.
5, 0.1)</td><td>(-0.9, -0.2)</td><td>(0.3, 1.1)</td><td>(-0.1, 0.6)</td><td>(-0.2, 0.5)
</td><td>(0.7, 1.8)</td><td>(-1.7, -0.9)</td><td>(0.6, 1.6)</td><td>(-0.02, 0.2)</td><td
>(0.8, 1.6)</td><td>(0.4, 1.2)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">female</td><td>-6.0</td><td>-3.0</td><td>-1.5</td><td
>1.1</td><td>-13.5<sup>*</sup></td><td>-0.1</td><td>-11.9<sup>*</sup></td><td>59.9<sup>*
**</sup></td><td>8.9</td><td>-8.8</td><td>6.6<sup>***</sup></td><td>12.9<sup>*</sup></td
><td>15.4<sup>*</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-18.4, 6.5)</td><td>(-18.8, 12.8)</td><td>
(-10.1, 7.1)</td><td>(-8.9, 11.0)</td><td>(-26.1, -1.0)</td><td>(-10.7, 10.6)</td><td>(-
23.8, -0.1)</td><td>(42.0, 77.9)</td><td>(-3.1, 21.0)</td><td>(-24.3, 6.7)</td><td>(3.3,
9.9)</td><td>(0.2, 25.5)</td><td>(1.7, 29.1)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">mm</td><td>-2.7<sup>***</sup></td><td>-0.6<sup>*</sup
></td><td>-0.3<sup>*</sup></td><td>-2.9<sup>***</sup></td><td>-0.7<sup>***</sup></td><td
>-0.3<sup>*</sup></td><td>-0.3</td><td>-0.8<sup>**</sup></td><td>-0.7<sup>***</sup></td>
<td>-0.3</td><td>-0.01</td><td>-1.3<sup>***</sup></td><td>-0.5<sup>**</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-3.0, -2.3)</td><td>(-1.0, -0.1)</td><td>(-
```

```
0.5, -0.1)</td><td>(-3.2, -2.6)</td><td>(-1.1, -0.3)</td><td>(-0.7, -0.04)</td><td>(-0.
7, 0.02)</td><td>(-1.3, -0.3)</td><td>(-1.0, -0.3)</td><td>(-0.7, 0.2)</td><td>(-0.1, 0.
1)</td><td>(-1.6, -0.9)</td><td>(-0.9, -0.2)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">hcc</td><td>252.4<sup>***</sup></td><td>179.1<sup>***
</sup></td><td>146.1<sup>***</sup></td><td>101.0<sup>***</sup></td><td>43.3<sup>***</sup
></td><td>74.3<sup>***</sup></td><td>31.4<sup>**</sup></td><td>313.4<sup>***</sup></td><
td>16.4</td><td>165.0<sup>***</sup></td><td>-3.3</td><td>101.0<sup>***</sup></td><td>80.
2<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(228.6, 276.2)</td><td>(148.7, 209.5)</td><t
d>(129.9, 162.4)</td><td>(82.1, 119.9)</td><td>(19.4, 67.3)</td><td>(54.0, 94.6)</td><td
>(8.9, 54.0)</td><td>(278.7, 348.1)</td><td>(-6.6, 39.4)</td><td>(135.1, 194.8)</td><td>
(-9.5, 2.9)</td><td>(76.7, 125.2)</td><td>(54.0, 106.4)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">Observations</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354
</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354</td
><td>3,354</td><td>3,354</td><td>3,354</td></tr>
## <tr><td style="text-align:left">Log Likelihood</td><td>-4,802.2</td><td>-5,571.4</td>
<td>-3,584.1</td><td>-4,062.8</td><td>-4,819.9</td><td>-4,290.5</td><td>-4,633.7</td><td
>-5,984.2</td><td>-4,691.3</td><td>-5,513.4</td><td>-418.9</td><td>-4,859.0</td><td>-5,1
04.3</td></tr>
## <tr><td style="text-align:left">Akaike Inf. Crit.</td><td>11,048.4</td><td>12,586.9</
td><td>8,612.3</td><td>9,569.6</td><td>11,083.8</td><td>10,025.1</td><td>10,711.4</td><t
d>13,412.4</td><td>10,826.5</td><td>12,470.7</td><td>2,281.8</td><td>11,162.1</td><td>1
1,652.5</td></tr>
## <tr><td colspan="14" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"><em>Note:</em></td><td colspan="13" style="text-align:right"><sup>*</
sup>p<0.05; <sup>**</sup>p<0.01; <sup>***</sup>p<0.001</td></tr>
## </table>
```

```
stargazer::stargazer(glmMatched7_c, glmMatched8_c, glmMatched9_c, glmMatched10_c, glmMat
ched10a_c, glmMatched10b_c,glmMatched10c_c,glmMatched10d_c,glmMatched10e_c,glmMatched10f
_c,glmMatched10g_c,
                    title="Utilization",
                    type = "html",
                    keep=c("om_flag","age","female","mm","hcc"),
                    ci=TRUE, ci.level=0.95,
                    apply.coef=exponentiate,apply.se = exponentiate,
                    digits = 1,
                    star.cutoffs = c(0.05, 0.01, 0.001),
                    column.labels = c("Emergency", "Hospital", "Primary Care", "Special
ist", "Mental Health", "Physical Therapy", "Drug admin", "Surgery", "Maternity", "Labs",
"Radiology"),
                    out = "table2c.htm")
```

```
## 
## <table style="text-align:center"><caption><strong>Utilization</strong></caption>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"></td><td colspan="11"><em>Dependent variable:</em></td></tr>
## <tr><td></td><td colspan="11" style="border-bottom: 1px solid black"></td></tr>
## <tr><td style="text-align:left"></td><td>logcount_er</td><td>logcount_hosp</td><td>lo
gcount_pcp</td><td>logcount_spec</td><td>logcount_mh</td><td>logcount_pt</td><td>logcoun
t_drugadmin</td><td>logcount_surg</td><td>logcount_maternity</td><td>logcount_labs</td><
td>logcount_rads</td></tr>
## <tr><td style="text-align:left"></td><td>Emergency</td><td>Hospital</td><td>Primary C
are</td><td>Specialist</td><td>Mental Health</td><td>Physical Therapy</td><td>Drug admin
</td><td>Surgery</td><td>Maternity</td><td>Labs</td><td>Radiology</td></tr>
## <tr><td style="text-align:left"></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td>
<td>(5)</td><td>(6)</td><td>(7)</td><td>(8)</td><td>(9)</td><td>(10)</td><td>(11)</td></
tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">om_flag</td><td>-3.0<sup>***</sup></td><td>-1.4<sup>***</sup></td><td
>-1.8<sup>*</sup></td><td>-6.6<sup>***</sup></td><td>-1.2<sup>*</sup></td><td>-0.7</td><
td>-2.5<sup>***</sup></td><td>-3.9<sup>***</sup></td><td>-0.1<sup>**</sup></td><td>-4.4<
sup>**</sup></td><td>-4.3<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-4.7, -1.3)</td><td>(-1.9, -0.9)</td><td>(-
3.4, -0.3)</td><td>(-7.8, -5.3)</td><td>(-2.4, -0.04)</td><td>(-3.6, 2.2)</td><td>(-3.8,
-1.2)</td><td>(-5.1, -2.7)</td><td>(-0.1, -0.02)</td><td>(-7.3, -1.5)</td><td>(-5.3, -3.
3)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">age</td><td>0.03</td><td>-0.004</td><td>-0.03</td><td
>0.1<sup>***</sup></td><td>0.1<sup>**</sup></td><td>0.03</td><td>-0.1<sup>***</sup></td>
<td>0.04<sup>*</sup></td><td>-0.001</td><td>0.3<sup>***</sup></td><td>0.1<sup>***</sup>
</td></tr>
## <tr><td style="text-align:left"></td><td>(-0.02, 0.1)</td><td>(-0.02, 0.01)</td><td>
(-0.1, 0.02)</td><td>(0.04, 0.1)</td><td>(0.02, 0.1)</td><td>(-0.1, 0.1)</td><td>(-0.2,
-0.1)</td><td>(0.003, 0.1)</td><td>(-0.003, 0.001)</td><td>(0.2, 0.3)</td><td>(0.02, 0.
1)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">female</td><td>-0.7</td><td>-0.3</td><td>-1.0</td><td
>-1.3<sup>*</sup></td><td>-0.3</td><td>-1.3</td><td>-1.2</td><td>-1.0</td><td>0.05</td><
td>4.3<sup>**</sup></td><td>0.8</td></tr>
## <tr><td style="text-align:left"></td><td>(-2.3, 1.0)</td><td>(-0.8, 0.1)</td><td>(-2.
5, 0.5)</td><td>(-2.5, -0.1)</td><td>(-1.5, 0.8)</td><td>(-4.1, 1.5)</td><td>(-2.4, 0.0
4)</td><td>(-2.2, 0.1)</td><td>(-0.01, 0.1)</td><td>(1.5, 7.0)</td><td>(-0.2, 1.7)</td>
</tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">mm</td><td>-0.2<sup>***</sup></td><td>-0.04<sup>***</
sup></td><td>-0.5<sup>***</sup></td><td>-0.2<sup>***</sup></td><td>-0.1<sup>***</sup></t
d><td>-0.3<sup>***</sup></td><td>-0.2<sup>***</sup></td><td>-0.1<sup>***</sup></td><td>-
0.002<sup>**</sup></td><td>-0.7<sup>***</sup></td><td>-0.1<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-0.2, -0.2)</td><td>(-0.1, -0.03)</td><td>
(-0.5, -0.5)</td><td>(-0.2, -0.2)</td><td>(-0.1, -0.1)</td><td>(-0.4, -0.2)</td><td>(-0.
3, -0.2)</td><td>(-0.2, -0.1)</td><td>(-0.004, -0.001)</td><td>(-0.7, -0.6)</td><td>(-0.
2, -0.1)</td></tr>
```

```
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">hcc</td><td>7.3<sup>***</sup></td><td>2.8<sup>***</su
p></td><td>8.8<sup>***</sup></td><td>-1.1</td><td>1.3</td><td>4.2</td><td>1.4</td><td>2.
0</td><td>-0.02</td><td>17.8<sup>***</sup></td><td>3.6<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(4.3, 10.4)</td><td>(1.9, 3.7)</td><td>(6.0,
11.5)</td><td>(-3.4, 1.2)</td><td>(-0.8, 3.4)</td><td>(-1.0, 9.4)</td><td>(-0.9, 3.7)</t
d><td>(-0.1, 4.2)</td><td>(-0.1, 0.1)</td><td>(12.7, 23.0)</td><td>(1.8, 5.3)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">Observations</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354
</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354</td
><td>3,354</td></tr>
## <tr><td style="text-align:left">Log Likelihood</td><td>1,887.4</td><td>6,087.2</td><t
d>2,235.0</td><td>2,913.4</td><td>3,165.9</td><td>141.7</td><td>2,890.1</td><td>3,080.7
</td><td>13,302.7</td><td>181.6</td><td>3,798.9</td></tr>
## <tr><td style="text-align:left">Akaike Inf. Crit.</td><td>-2,330.8</td><td>-10,730.3
</td><td>-3,026.0</td><td>-4,382.8</td><td>-4,887.8</td><td>1,160.5</td><td>-4,336.1</td
><td>-4,717.4</td><td>-25,161.3</td><td>1,080.8</td><td>-6,153.7</td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"><em>Note:</em></td><td colspan="11" style="text-align:right"><sup>*</
sup>p<0.05; <sup>**</sup>p<0.01; <sup>***</sup>p<0.001</td></tr>
## </table>
```

```
stargazer::stargazer(glmMatched11_c, glmMatched11b_c, glmMatched11c_c, glmMatched5c_c, g
lmMatched5ca_c, glmMatched5cb_c,  glmMatched5cc_c,  glmMatched5cd_c,  glmMatched5ce_c,
glmMatched5cf_c,  glmMatched5cg_c,
                    title="Cost per Utilization",
                    type = "html",
                    keep=c("om_flag","age","female","mm","hcc"),
                    ci=TRUE, ci.level=0.95,
                    apply.coef=exponentiate,apply.se = exponentiate,
                    digits = 1,
                    star.cutoffs = c(0.05, 0.01, 0.001),
                    column.labels = c("Emergency", "Hospital", "Primary Care", "Special
ist", "Mental Health", "Physical Therapy", "Drug admin", "Surgery", "Maternity", "Labs",
"Radiology"),
                    out = "table3c.htm")
```

```
##
## <table style="text-align:center"><caption><strong>Cost per Utilization</strong></capt
ion>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"></td><td colspan="11"><em>Dependent variable:</em></td></tr>
## <tr><td></td><td colspan="11" style="border-bottom: 1px solid black"></td></tr>
## <tr><td style="text-align:left"></td><td>logcost_per_er</td><td>logcost_per_hosp</td>
<td>logcost_per_pcp</td><td>logcost_per_spec</td><td>logcost_per_mh</td><td>logcost_per_
pt</td><td>logcost_per_drugadmin</td><td>logcost_per_surg</td><td>logcost_per_maternity
</td><td>logcost_per_labs</td><td>logcost_per_rads</td></tr>
## <tr><td style="text-align:left"></td><td>Emergency</td><td>Hospital</td><td>Primary C
are</td><td>Specialist</td><td>Mental Health</td><td>Physical Therapy</td><td>Drug admin
</td><td>Surgery</td><td>Maternity</td><td>Labs</td><td>Radiology</td></tr>
## <tr><td style="text-align:left"></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td>
<td>(5)</td><td>(6)</td><td>(7)</td><td>(8)</td><td>(9)</td><td>(10)</td><td>(11)</td></
tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">om_flag</td><td>2.4</td><td>-8.5</td><td>93.7<sup>***</sup></td><td>-
77.2<sup>***</sup></td><td>-18.7<sup>*</sup></td><td>68.5<sup>***</sup></td><td>-1.6</td
><td>-34.4<sup>**</sup></td><td>4.3</td><td>27.2<sup>***</sup></td><td>-45.6<sup>***</su
p></td></tr>
## <tr><td style="text-align:left"></td><td>(-1.1, 6.0)</td><td>(-25.7, 8.8)</td><td>(8
1.4, 106.0)</td><td>(-102.0, -52.4)</td><td>(-36.5, -0.9)</td><td>(51.6, 85.4)</td><td>
(-19.3, 16.2)</td><td>(-57.6, -11.1)</td><td>(-32.3, 40.9)</td><td>(16.4, 38.1)</td><td>
(-65.6, -25.6)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">age</td><td>-0.1</td><td>-0.1</td><td>-0.4<sup>*</sup
></td><td>1.4<sup>***</sup></td><td>0.2</td><td>0.3</td><td>-1.4<sup>***</sup></td><td>
0.6</td><td>0.4</td><td>0.7<sup>***</sup></td><td>0.8<sup>**</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(-0.2, 0.03)</td><td>(-0.6, 0.5)</td><td>(-
0.8, -0.1)</td><td>(0.6, 2.1)</td><td>(-0.3, 0.7)</td><td>(-0.2, 0.8)</td><td>(-1.9, -0.
9)</td><td>(-0.1, 1.3)</td><td>(-0.6, 1.5)</td><td>(0.4, 1.0)</td><td>(0.2, 1.4)</td></t
r>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">female</td><td>1.3</td><td>-2.0</td><td>6.8</td><td>-
15.3</td><td>1.4</td><td>-14.8</td><td>16.4</td><td>-11.2</td><td>9.0</td><td>14.3<sup>*
*</sup></td><td>12.1</td></tr>
## <tr><td style="text-align:left"></td><td>(-2.1, 4.7)</td><td>(-18.5, 14.6)</td><td>(-
5.1, 18.6)</td><td>(-39.1, 8.5)</td><td>(-15.7, 18.5)</td><td>(-31.1, 1.4)</td><td>(-0.
7, 33.5)</td><td>(-33.5, 11.2)</td><td>(-26.1, 44.1)</td><td>(3.9, 24.8)</td><td>(-7.1,
31.3)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">mm</td><td>0.1</td><td>-0.3</td><td>0.03</td><td>1.9<
sup>***</sup></td><td>0.3</td><td>0.5<sup>*</sup></td><td>1.0<sup>***</sup></td><td>1.0<
sup>**</sup></td><td>6.7<sup>***</sup></td><td>0.4<sup>**</sup></td><td>0.7<sup>**</sup>
</td></tr>
## <tr><td style="text-align:left"></td><td>(-0.05, 0.1)</td><td>(-0.8, 0.1)</td><td>(-
0.3, 0.4)</td><td>(1.3, 2.6)</td><td>(-0.2, 0.8)</td><td>(0.1, 1.0)</td><td>(0.6, 1.5)</
td><td>(0.4, 1.6)</td><td>(5.7, 7.6)</td><td>(0.1, 0.7)</td><td>(0.2, 1.2)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
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></td><td></td><td></td><td></td><td></td><td></td></tr>
## <tr><td style="text-align:left">hcc</td><td>13.8<sup>***</sup></td><td>62.6<sup>***</
sup></td><td>20.6</td><td>147.2<sup>***</sup></td><td>143.9<sup>***</sup></td><td>36.6<s
up>*</sup></td><td>16.0</td><td>118.1<sup>***</sup></td><td>44.9</td><td>30.4<sup>**</su
p></td><td>126.3<sup>***</sup></td></tr>
## <tr><td style="text-align:left"></td><td>(7.4, 20.1)</td><td>(30.8, 94.5)</td><td>(-
2.0, 43.1)</td><td>(100.7, 193.8)</td><td>(110.9, 176.9)</td><td>(5.3, 67.8)</td><td>(-1
6.9, 48.9)</td><td>(74.6, 161.5)</td><td>(-25.3, 115.0)</td><td>(10.6, 50.3)</td><td>(8
9.1, 163.5)</td></tr>
## <tr><td style="text-align:left"></td><td></td><td></td><td></td><td></td><td></td><td
></td><td></td><td></td><td></td><td></td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left">Observations</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354
</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354</td><td>3,354</td
><td>3,354</td></tr>
## <tr><td style="text-align:left">Log Likelihood</td><td>-524.0</td><td>-5,719.2</td><t
d>-4,629.3</td><td>-6,882.2</td><td>-5,825.6</td><td>-5,656.1</td><td>-5,818.6</td><td>-
6,673.7</td><td>-8,095.8</td><td>-4,221.5</td><td>-6,197.8</td></tr>
## <tr><td style="text-align:left">Akaike Inf. Crit.</td><td>2,491.9</td><td>12,882.3</t
d><td>10,702.6</td><td>15,208.5</td><td>13,095.2</td><td>12,756.2</td><td>13,081.2</td><
td>14,791.4</td><td>17,635.5</td><td>9,886.9</td><td>13,839.6</td></tr>
## <tr><td colspan="12" style="border-bottom: 1px solid black"></td></tr><tr><td style
="text-align:left"><em>Note:</em></td><td colspan="11" style="text-align:right"><sup>*</
sup>p<0.05; <sup>**</sup>p<0.01; <sup>***</sup>p<0.001</td></tr>
## </table>
```

```
save.image("onemedical.RData")
```