```
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-----------------------------------------------
      name:
       log:  ...\LTO Mortality\Logs\analysis_lto_mortality_20230605.log
  log type:  text
 opened on:   5 Jun 2023, 15:46:46

.
.
*************************************************************************
*
. * Project:      LTO Mortality in COVID+ patients
. *
. * Author:       Sarah Seelye
. *
. * Date Created: 2022 May 24
. * Date Updated: 2023 June 5
.
*************************************************************************
*
.
. * open death dataset using Portland mortality definitions
. use Data\cohort_dod_allsrc, clear

.
. * address duplicates
. duplicates report patienticn

Duplicates in terms of patienticn

--------------------------------------
   Copies | Observations       Surplus
----------+---------------------------
        1 |      3147853             0
        2 |          266           133
--------------------------------------

. duplicates report patienticn birthdate

Duplicates in terms of patienticn birthdate

--------------------------------------
   Copies | Observations       Surplus
----------+---------------------------
        1 |      3147853             0
        2 |          266           133
--------------------------------------

.         //all of the duplicates have the same birthdate and
patienticn.
. duplicates report patienticn scrssn_numeric
```

```
Duplicates in terms of patienticn scrssn_numeric

--------------------------------------
   Copies | Observations       Surplus
----------+---------------------------
        1 |      3148119             0
--------------------------------------

.         //patienticn and SCRSSN uniquely identify patients, but SCRSSN
is not
.         //included in the matchedcohort dataset
. duplicates tag patienticn, gen(dup)

Duplicates in terms of patienticn

. tab dup //266 duplicates; 133 unique Vets

        dup |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  3,147,853       99.99       99.99
          1 |        266        0.01      100.00
------------+-----------------------------------
      Total |  3,148,119      100.00

. bysort patienticn (scrssn): gen patientn = _n

. bysort patienticn: gen dod_notsame = 1 if
best_death_date!=best_death_date[_n-1] & patientn==2
(3,148,105 missing values generated)

. bysort patienticn: egen dod_notsame_pat = max(dod_notsame)
(3,148,091 missing values generated)

. tab dod_notsame_pat patientn

dod_notsam |       patientn
     e_pat |         1          2 |     Total
-----------+----------------------+----------
         1 |        14         14 |        28
-----------+----------------------+----------
     Total |        14         14 |        28


.
. * drop duplicates that have different birth dates
. drop if dup==1 & dod_notsame_pat==1
(28 observations deleted)


.
. * drop duplicate patienticns for second SCRSSN on record
. drop if patientn==2
(119 observations deleted)

.
. * keep variables for merge
```

```
. keep patienticn best_death_date

. destring patienticn, replace
patienticn: all characters numeric; replaced as long

.
. format best_death_date %td

.
. tempfile dod

. save `dod'
file D:\Temp\STATA\VHAANNSeelyS\ST_9a30_000001.tmp saved as .dta format

.
. * merge dod dataset with updated _datalong dataset(version 8/22/2022)
. use Data\matchedcohort_25to1_datalong, clear
(Created in file
'P:\ORD_Ioannou_202104007D\MethodsGroup\Programs\CORC_DataExplor)

. destring patienticn, replace
patienticn: all characters numeric; replaced as long

. format patienticn %12.0g

.
. merge m:1 patienticn using `dod'

    Result                      Number of obs
    -----------------------------------------
    Not matched                            83
        from master                        83  (_merge==1)
        from using                          0  (_merge==2)

    Matched                         5,382,629  (_merge==3)
    -----------------------------------------

. drop _merge

.
. *-----------------------------
. * Build 5:1 Matched Cohort
. *-----------------------------
.
. * drop comparators who aren't matched to cases
. tab ismatched_case

 case has a |
     match? |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |        776        0.01        0.01
          1 |  5,381,936       99.99      100.00
------------+-----------------------------------
      Total |  5,382,712      100.00
```

```
. drop if ismatched_case==0
(776 observations deleted)

. count //n=5,381,936
  5,381,936

. tab case //case=208,536

 indicator: |
         is |
 `index_dt` |
the date of |
  the first |
   positive |
   covid-19 |
test result |
        for |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  5,173,400       96.13       96.13
          1 |    208,536        3.87      100.00
------------+-----------------------------------
      Total |  5,381,936      100.00

.
. * create a new index_dt variable to use the case's index date for all
controls
. gen index_dt_case = index_dt if case==1
(5,173,400 missing values generated)

. format index_dt_case %td

. gsort matchgroupnumber -case

. by matchgroupnumber: replace index_dt_case = index_dt_case[_n-1] if
index_dt_case[_n-1]!=.
(5173400 real changes made)

.
. * create an indextodeath variable to count number of days between
index date
. * and death
. gen indextodeath_caseindex = best_death_date-index_dt_case
(4,979,036 missing values generated)

. sum indextodeath_caseindex

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |    402,900    287.2704    304.4486     -28306        881

. sum indextodeath_caseindex if indextodeath_caseindex<0

    Variable |        Obs        Mean    Std. dev.       Min        Max
```

```
-------------+---------------------------------------------------------
indextodea~x |     11,653   -284.7707    1266.695     -28306         -1

.
. * drop indextodeath_caseindex<0 to exclude observations that die
before the
. * index date
. drop if indextodeath_caseindex<0
(11,653 observations deleted)

. tab case //case=208,063

 indicator: |
         is |
 `index_dt` |
the date of |
  the first |
   positive |
   covid-19 |
test result |
        for |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  5,162,220       96.13       96.13
          1 |    208,063        3.87      100.00
------------+-----------------------------------
      Total |  5,370,283      100.00

.
. * drop those with an infection date prior to index date
. * create time-to-infection variable
. gen ttinfection = futureinfectedcontrolindexdate - index_dt_case
(4,682,272 missing values generated)

.
. sum ttinfection

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |    688,011    338.3773    180.3509       -417        867

. sum ttinfection if ttinfection <0

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |      1,411   -61.74557    63.32246       -417         -1

. drop if ttinfection<0 //n=1411
(1,411 observations deleted)

. tab case //case=208,063

 indicator: |
         is |
 `index_dt` |
```

```
the date of |
  the first |
   positive |
    covid-19 |
test result |
        for |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  5,160,809       96.12       96.12
          1 |    208,063        3.88      100.00
------------+-----------------------------------
      Total |  5,368,872      100.00

.
. drop ttinfection

.
. * keep the best 5 matches
. gsort matchgroupnumber propensityscoreabsdiffrank -case

. by matchgroupnumber: gen n = _n

. tab n

          n |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |    208,536        3.88        3.88
          2 |    208,533        3.88        7.77
          3 |    208,198        3.88       11.65
          4 |    207,853        3.87       15.52
          5 |    207,664        3.87       19.39
          6 |    207,532        3.87       23.25
          7 |    207,375        3.86       27.11
          8 |    207,263        3.86       30.97
          9 |    207,173        3.86       34.83
         10 |    207,096        3.86       38.69
         11 |    207,040        3.86       42.55
         12 |    206,971        3.86       46.40
         13 |    206,888        3.85       50.25
         14 |    206,801        3.85       54.11
         15 |    206,736        3.85       57.96
         16 |    206,696        3.85       61.81
         17 |    206,645        3.85       65.66
         18 |    206,575        3.85       69.50
         19 |    206,491        3.85       73.35
         20 |    206,423        3.84       77.19
         21 |    206,341        3.84       81.04
         22 |    206,304        3.84       84.88
         23 |    206,258        3.84       88.72
         24 |    206,154        3.84       92.56
         25 |    205,551        3.83       96.39
         26 |    193,775        3.61      100.00
------------+-----------------------------------
      Total |  5,368,872      100.00
```

```
.
. keep if n<=6
(4,120,556 observations deleted)

.
. tab n

          n |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |    208,536       16.71       16.71
          2 |    208,533       16.71       33.41
          3 |    208,198       16.68       50.09
          4 |    207,853       16.65       66.74
          5 |    207,664       16.64       83.38
          6 |    207,532       16.62      100.00
------------+-----------------------------------
      Total |  1,248,316      100.00

. tab n case

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
           | covid-19 test result
           |          for
         n |         0          1 |     Total
-----------+----------------------+----------
         1 |       473    208,063 |   208,536
         2 |   208,533          0 |   208,533
         3 |   208,198          0 |   208,198
         4 |   207,853          0 |   207,853
         5 |   207,664          0 |   207,664
         6 |   207,532          0 |   207,532
-----------+----------------------+----------
     Total | 1,040,253    208,063 | 1,248,316

.
. bysort matchgroupnumber (n): egen totalpairs = max(n)

. tab totalpairs

 totalpairs |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |          3        0.00        0.00
          2 |        670        0.05        0.05
          3 |      1,035        0.08        0.14
          4 |        756        0.06        0.20
          5 |        660        0.05        0.25
          6 |  1,245,192       99.75      100.00
------------+-----------------------------------
      Total |  1,248,316      100.00

. tab totalpairs case // 3 patients - 2 cases - have no matched pair
```

```
           |     indicator: is
           |  `index_dt` the date
           | of the first positive
           | covid-19 test result
           |          for
totalpairs |         0          1 |     Total
-----------+----------------------+----------
         1 |         1          2 |         3
         2 |       335        335 |       670
         3 |       691        344 |     1,035
         4 |       567        189 |       756
         5 |       528        132 |       660
         6 | 1,038,131    207,061 | 1,245,192
-----------+----------------------+----------
     Total | 1,040,253    208,063 | 1,248,316

.
. * drop the 3 patients with no matched pair
. drop if totalpairs==1
(3 observations deleted)

. tab case //case=208,061

 indicator: |
         is |
 `index_dt` |
the date of |
  the first |
   positive |
   covid-19 |
test result |
        for |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  1,040,252       83.33       83.33
          1 |    208,061       16.67      100.00
------------+-----------------------------------
      Total |  1,248,313      100.00

.
. * confirm that all matched groups have a case
. bysort matchgroupnumber: egen groupwithacase = max(case)

. tab groupwithacase //2,829 comparators don't have a matched case

groupwithac |
        ase |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |      2,829        0.23        0.23
          1 |  1,245,484       99.77      100.00
------------+-----------------------------------
      Total |  1,248,313      100.00

.
. * drop comparator observations who don't have a matched case
```

```
. drop if groupwithacase==0 //2,829 comparators dropped
(2,829 observations deleted)

.
. * confirm that each case does not have more than 5 controls
. gen control = case==0

. by matchgroupnumber: egen totalcontrols = sum(control)

. tab totalcontrols if case==1

totalcontro |
         ls |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        335        0.16        0.16
          2 |        344        0.17        0.33
          3 |        189        0.09        0.42
          4 |        132        0.06        0.48
          5 |    207,061       99.52      100.00
------------+-----------------------------------
      Total |    208,061      100.00

.
. * count
. tab case //n=1,245,484, of which 208,061 are cases

 indicator: |
         is |
 `index_dt` |
the date of |
  the first |
   positive |
   covid-19 |
test result |
        for |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  1,037,423       83.29       83.29
          1 |    208,061       16.71      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

.
. * drop variables no longer needed
. drop n totalpairs groupwithacase control totalcontrols

.
. * merge with covid+ hospitalization dataset
. merge 1:1 matchgroupnumber patienticn using
Data\Hospitalizations\lto_mortality_hospitalizations_20230516

    Result                      Number of obs
    ----------------------------------------
    Not matched                     1,237,206
        from master                 1,185,956  (_merge==1)
```

```
        from using                     51,250  (_merge==2)

    Matched                            59,528  (_merge==3)
    -----------------------------------------

. drop if _merge==2
(51,250 observations deleted)

. drop _merge

. count //1,245,484
  1,245,484

.
. recode index_hospitalization (.=0)
(1,185,956 changes made to index_hospitalization)

.
. * identify matchgroups in which the covid+ case was hospitalized/not
hospitalized
. gen case_hospitalized=index_hospitalization==1 if case==1
(1,037,423 missing values generated)

. bysort matchgroupnumber: egen case_hospitalized_matchgrp =
max(case_hospitalized)

.
. drop case_hospitalized

.
. *-------------------------
. * Construct Covariates
. *-------------------------
.
. * create a new unique patient id variable that combines patienticn &
matchgroupnumber
. tostring patienticn, gen(patienticn_str)
patienticn_str generated as str10

. tostring matchgroupnumber, gen(matchgroup_str)
matchgroup_str generated as str6

.
. gen uniq_patid_str = patienticn_str + matchgroup_str

. destring uniq_patid_str, gen(uniq_patid)
uniq_patid_str: all characters numeric; uniq_patid generated as double

. format uniq_patid %14.0g

.
. drop patienticn_str matchgroup_str uniq_patid_str

. duplicates report uniq_patid
```

```
Duplicates in terms of uniq_patid

--------------------------------------
   Copies | Observations       Surplus
----------+---------------------------
        1 |      1245484             0
--------------------------------------


.
. * wave of infection
.         * March-June 2020
.         * July-Nov 2020
.         * Dec 2020-Apr 2021
.
. tab index_month

  number of |
     months |
    *after* |
 march 2020 |
   when the |
 index date |
    occurs, |
      i.e., |
 0=march 20 |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |     13,998        1.12        1.12
          1 |     40,162        3.22        4.35
          2 |     26,037        2.09        6.44
          3 |     41,683        3.35        9.79
          4 |     89,471        7.18       16.97
          5 |     50,101        4.02       20.99
          6 |     40,590        3.26       24.25
          7 |     72,930        5.86       30.11
          8 |    185,021       14.86       44.96
          9 |    261,384       20.99       65.95
         10 |    216,893       17.41       83.36
         11 |     93,827        7.53       90.90
         12 |     59,322        4.76       95.66
         13 |     54,065        4.34      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

.
. gen wave = .
(1,245,484 missing values generated)

. replace wave = 1 if inrange(index_month, 0, 3)
(121,880 real changes made)

. replace wave = 2 if inrange(index_month, 4, 8)
(438,113 real changes made)
```

```
. replace wave = 3 if inrange(index_month, 9, 13)
(685,491 real changes made)

. tab index_month wave
```

number of months *after* march 2020 when the index date occurs, i.e.,	wave			
0=march 20	1	2	3	Total
0	13,998	0	0	13,998
1	40,162	0	0	40,162
2	26,037	0	0	26,037
3	41,683	0	0	41,683
4	0	89,471	0	89,471
5	0	50,101	0	50,101
6	0	40,590	0	40,590
7	0	72,930	0	72,930
8	0	185,021	0	185,021
9	0	0	261,384	261,384
10	0	0	216,893	216,893
11	0	0	93,827	93,827
12	0	0	59,322	59,322
13	0	0	54,065	54,065
Total	121,880	438,113	685,491	1,245,484

```
.
. * age categories
. sum ageatindexdate

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
ageatinde~te |  1,245,484    60.47358    16.41887   18.88493   99.99726

.
. gen agecat = .
(1,245,484 missing values generated)

. replace agecat=1 if ageatindexdate<65
(670,258 real changes made)

. replace agecat=2 if inrange(ageatindexdate, 65, 85)
(513,602 real changes made)

. replace agecat=3 if ageatindexdate>85
(61,624 real changes made)

.
```

```
. * create indicator for COVID+ cases
. gen infected = .
(1,245,484 missing values generated)

. replace infected = 1 if case==1
(208,061 real changes made)

. replace infected = 0 if case==0
(1,037,423 real changes made)

.
. * label values of categorical variables
. tab sex3cat infected

    sex of |
   veteran |       infected
 (3-level) |         0          1 |     Total
-----------+----------------------+----------
         0 |    13,977      2,899 |    16,876
         1 |   109,085     21,936 |   131,021
         2 |   914,361    183,226 | 1,097,587
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

. recode sex3cat 0=99
(16,876 changes made to sex3cat)

. lab def sex3cat 99 "Unknown" 1 "Female" 2 "Male", replace

. lab val sex3cat sex3cat

. tab sex3cat infected

    sex of |
   veteran |       infected
 (3-level) |         0          1 |     Total
-----------+----------------------+----------
    Female |   109,085     21,936 |   131,021
      Male |   914,361    183,226 | 1,097,587
   Unknown |    13,977      2,899 |    16,876
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. tab race7cat infected

   race of |
   veteran |       infected
 (7-level) |         0          1 |     Total
-----------+----------------------+----------
         0 |    63,531     12,851 |    76,382
         1 |     9,578      1,961 |    11,539
         2 |    10,536      2,081 |    12,617
         3 |   237,896     47,645 |   285,541
```

```
          4 |      9,704      1,944 |     11,648
          5 |    696,309    139,604 |    835,913
          6 |      9,869      1,975 |     11,844
------------+----------------------+-----------
      Total | 1,037,423    208,061 | 1,245,484

. recode race7cat 0=99
(76,382 changes made to race7cat)

. lab def race7cat 1 "AmericanIndian/AlaskaNative" 2 "Asian" 3
"Black/AfricanAmer" ///
>                                   4 "NativeHawaiian/PacificIsland" 5
"White" 6 "MultipleRace"     ///
>                                   99 "Missing" , replace

. lab val race7cat race7cat

. tab race7cat infected

      race of veteran |       infected
            (7-level) |         0          1 |     Total
----------------------+----------------------+----------
AmericanIndian/Alaska |     9,578      1,961 |    11,539
                Asian |    10,536      2,081 |    12,617
    Black/AfricanAmer |   237,896     47,645 |   285,541
NativeHawaiian/Pacifi |     9,704      1,944 |    11,648
                White |   696,309    139,604 |   835,913
          MultipleRace |     9,869      1,975 |    11,844
               Missing |    63,531     12,851 |    76,382
----------------------+----------------------+----------
                Total | 1,037,423    208,061 | 1,245,484

.
. tab ethnicity3cat infected

 ethnicity |
of veteran |       infected
 (3-level) |         0          1 |     Total
-----------+----------------------+----------
         0 |    35,330      7,106 |    42,436
         1 |    99,093     20,280 |   119,373
         2 |   903,000    180,675 | 1,083,675
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

. recode ethnicity3cat 0=99
(42,436 changes made to ethnicity3cat)

. lab def ethnicity3cat 1 "Hispanic" 2 "NotHispanic" 99 "Missing",
replace

. lab val ethnicity3cat ethnicity3cat

. tab ethnicity3cat infected, nol
```

```
 ethnicity |
of veteran |       infected
 (3-level) |         0          1 |     Total
-----------+----------------------+----------
         1 |    99,093     20,280 |   119,373
         2 |   903,000    180,675 | 1,083,675
        99 |    35,330      7,106 |    42,436
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. tab rurality2cat infected

  rurality |
        of |
 veteran's |
  home zip |
      code |       infected
 (2-level) |         0          1 |     Total
-----------+----------------------+----------
         0 |   294,989     59,064 |   354,053
         1 |   742,434    148,997 |   891,431
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

. lab def rurality2cat 0 "NotUrban" 1 "Urban", replace

. lab val rurality2cat rurality2cat

. tab rurality2cat infected

  rurality |
        of |
 veteran's |
  home zip |
      code |       infected
 (2-level) |         0          1 |     Total
-----------+----------------------+----------
  NotUrban |   294,989     59,064 |   354,053
     Urban |   742,434    148,997 |   891,431
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. tab smoking4cat infected

   smoking |
 status of |
   veteran |       infected
 (4-level) |         0          1 |     Total
-----------+----------------------+----------
         0 |    57,618     12,115 |    69,733
         1 |   131,249     26,144 |   157,393
```

```
          2 |   439,908     88,025 |   527,933
          3 |   408,648     81,777 |   490,425
------------+----------------------+----------
      Total | 1,037,423    208,061 | 1,245,484

. recode smoking4cat 0=99
(69,733 changes made to smoking4cat)

. lab def smoking4cat 1 "Current" 2 "Former" 3 "Never" 99 "Missing",
replace

. lab val smoking4cat smoking4cat

. tab smoking4cat infected

   smoking |
 status of |
   veteran |       infected
 (4-level) |         0          1 |     Total
-----------+----------------------+----------
   Current |   131,249     26,144 |   157,393
    Former |   439,908     88,025 |   527,933
     Never |   408,648     81,777 |   490,425
   Missing |    57,618     12,115 |    69,733
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. tab immuno infected

immunosupp |       infected
   ressed? |         0          1 |     Total
-----------+----------------------+----------
         0 |   936,167    187,748 | 1,123,915
         1 |   101,256     20,313 |   121,569
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

. tab clcatindexdate infected

  clc care |
  received |
 before or |
  on index |       infected
      date |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,027,879    205,899 | 1,233,778
         1 |     9,544      2,162 |    11,706
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. tab nosos11cat infected
```

```
     nosos |       infected
(11-level) |         0          1 |     Total
-----------+----------------------+----------
         0 |    25,455      4,789 |    30,244
         1 |    26,035      5,694 |    31,729
         2 |    45,530      9,582 |    55,112
         3 |    60,994     12,431 |    73,425
         4 |    75,933     15,159 |    91,092
         5 |    90,104     17,707 |   107,811
         6 |   105,586     20,526 |   126,112
         7 |   119,913     23,431 |   143,344
         8 |   136,532     26,893 |   163,425
         9 |   157,063     31,294 |   188,357
        10 |   194,278     40,555 |   234,833
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

. recode nosos11cat 0=99
(30,244 changes made to nosos11cat)

. tab nosos11cat infected

     nosos |       infected
(11-level) |         0          1 |     Total
-----------+----------------------+----------
         1 |    26,035      5,694 |    31,729
         2 |    45,530      9,582 |    55,112
         3 |    60,994     12,431 |    73,425
         4 |    75,933     15,159 |    91,092
         5 |    90,104     17,707 |   107,811
         6 |   105,586     20,526 |   126,112
         7 |   119,913     23,431 |   143,344
         8 |   136,532     26,893 |   163,425
         9 |   157,063     31,294 |   188,357
        10 |   194,278     40,555 |   234,833
        99 |    25,455      4,789 |    30,244
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. tab canscore7cat infected

 can score |       infected
 (7-level) |         0          1 |     Total
-----------+----------------------+----------
         0 |    20,816      4,056 |    24,872
         1 |   170,471     34,417 |   204,888
         2 |   160,008     31,900 |   191,908
         3 |   194,475     38,219 |   232,694
         4 |   235,676     46,759 |   282,435
         5 |   153,135     30,638 |   183,773
         6 |   102,842     22,072 |   124,914
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
```

```
. recode canscore7cat 0=99
(24,872 changes made to canscore7cat)

. tab canscore7cat infected

 can score |       infected
 (7-level) |         0          1 |     Total
-----------+----------------------+----------
         1 |   170,471     34,417 |   204,888
         2 |   160,008     31,900 |   191,908
         3 |   194,475     38,219 |   232,694
         4 |   235,676     46,759 |   282,435
         5 |   153,135     30,638 |   183,773
         6 |   102,842     22,072 |   124,914
        99 |    20,816      4,056 |    24,872
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. *--------------------------
. * Time to Study End
. *--------------------------
.
. * identify study end as April 1, 2022
. gen studyend = mdy(4, 1, 2022)

. format studyend %td

.
. * count days from index to studyend
. gen ttstudyend = studyend-index_dt_case

.
. *-----------------------
. * Mortality Variables
. *-----------------------
.
. * Alive on day 91
. gen alive_day91 = .
(1,245,484 missing values generated)

. replace alive_day91 = 1 if indextodeath_caseindex>=91
(1,221,670 real changes made)

. replace alive_day91 = 0 if inrange(indextodeath_caseindex, 0, 90)
(23,814 real changes made)

. replace alive_day91 = 0 if ttstudyend<91
(0 real changes made)

. bysort alive_day91: sum indextodeath_caseindex

-------------------------------------------------------------------------------
```

```
-------------------------------------------------------------------------------
-------------------------------------------------
-> alive_day91 = 0

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+--------------------------------------------------------
indextodea~x |     23,814    32.98224     25.4598          0         90

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-------------------------------------------------
-> alive_day91 = 1

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+--------------------------------------------------------
indextodea~x |     72,781    360.3306    166.2994         91        881


. 
. * Alive on day 181
. gen alive_day181 = .
(1,245,484 missing values generated)

. replace alive_day181 = 1 if indextodeath_caseindex>=181
(1,209,311 real changes made)

. replace alive_day181 = 0 if inrange(indextodeath_caseindex, 0, 180)
(36,173 real changes made)

. replace alive_day181 = 0 if ttstudyend<181
(0 real changes made)

. bysort alive_day181: sum indextodeath_caseindex

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-------------------------------------------------
-> alive_day181 = 0

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+--------------------------------------------------------
indextodea~x |     36,173    67.94139    54.91375          0        180

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-------------------------------------------------
-> alive_day181 = 1

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+--------------------------------------------------------
indextodea~x |     60,422    406.3589    143.8607        181        881


.
```

```
. * Alive on day 366
. gen alive_day366 = .
(1,245,484 missing values generated)

. replace alive_day366 = 1 if indextodeath_caseindex>=366
(1,183,181 real changes made)

. replace alive_day366 = 0 if inrange(indextodeath_caseindex, 0, 365)
(62,303 real changes made)

. replace alive_day366 = 0 if ttstudyend<366
(52,071 real changes made)

. bysort alive_day366: sum indextodeath_caseindex

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-------------------------------------------
-> alive_day366 = 0

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     62,734    156.0614    116.8082          0        498

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-------------------------------------------
-> alive_day366 = 1

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     33,861    508.5585    103.4674        366        881


.
. * Died Index Day-Day 90
. gen died_0_90 = .
(1,245,484 missing values generated)

. replace died_0_90 = 1 if inrange(indextodeath_caseindex, 0, 90)
(23,814 real changes made)

. replace died_0_90 = 0 if indextodeath_caseindex>90
(1,221,670 real changes made)

. tab died_0_90, m

  died_0_90 |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  1,221,670       98.09       98.09
          1 |     23,814        1.91      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00
```

```
.
. * Died Day 91-Day 180
. gen died_91_180 = .
(1,245,484 missing values generated)

. replace died_91_180 = 1 if inrange(indextodeath_caseindex, 91, 180)
(12,359 real changes made)

. replace died_91_180 = 0 if indextodeath_caseindex>180
(1,209,311 real changes made)

. replace died_91_180 = 0 if (indextodeath_caseindex>ttstudyend) &
(inrange(indextodeath_caseindex, 91, 180)) ///
>
& (inrange(ttstudyend, 91, 180))
(0 real changes made)

. tab died_91_180, m

died_91_180 |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  1,209,311       97.10       97.10
          1 |     12,359        0.99       98.09
          . |     23,814        1.91      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

. sum indextodeath_caseindex if indextodeath_caseindex<91

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     23,814    32.98224     25.4598          0         90

.
. * Died Day 181-Day 365
. gen died_181_365 = .
(1,245,484 missing values generated)

. replace died_181_365 = 1 if inrange(indextodeath_caseindex, 181, 365)
(26,130 real changes made)

. replace died_181_365 = 0 if indextodeath_caseindex>365
(1,183,181 real changes made)

. replace died_181_365 = 0 if (indextodeath_caseindex>ttstudyend) &
(inrange(indextodeath_caseindex, 181, 365)) ///
>
& (inrange(ttstudyend, 181, 365))
(63 real changes made)

. tab died_181_365, m

died_181_36 |
          5 |      Freq.     Percent        Cum.
```

```
------------+-----------------------------------
          0 |  1,183,244       95.00       95.00
          1 |     26,067        2.09       97.10
          . |     36,173        2.90      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

. sum indextodeath_caseindex if indextodeath_caseindex<181

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     36,173    67.94139    54.91375          0        180

.
. * Died Day 366-730
. gen died_366_730 = .
(1,245,484 missing values generated)

. replace died_366_730 = 1 if inrange(indextodeath_caseindex, 366, 730)
(32,904 real changes made)

. replace died_366_730 = 0 if indextodeath_caseindex>730
(1,150,277 real changes made)

. replace died_366_730 = 0 if (indextodeath_caseindex>ttstudyend) &
(inrange(indextodeath_caseindex, 366, 730)) ///
>
& (inrange(ttstudyend, 366, 730))
(12,316 real changes made)

. tab died_366_730, m

died_366_73 |
          0 |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  1,162,593       93.34       93.34
          1 |     20,588        1.65       95.00
          . |     62,303        5.00      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

. sum indextodeath_caseindex if indextodeath_caseindex<366

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     62,303    154.2197    115.0548          0        365

.
. * Died Day 0-365
. gen died_0_365 = .
(1,245,484 missing values generated)

. replace died_0_365 = 1 if inrange(indextodeath_caseindex, 0, 365)
(62,303 real changes made)
```

```
. replace died_0_365 = 0 if indextodeath_caseindex>365
(1,183,181 real changes made)

. replace died_0_365 = 0 if (indextodeath_caseindex>ttstudyend) &
(inrange(indextodeath_caseindex, 0, 365)) ///
>
& (inrange(ttstudyend, 0, 365))
(63 real changes made)


.
. * Died Day 0-730
. gen died_0_730 = .
(1,245,484 missing values generated)

. replace died_0_730 = 1 if inrange(indextodeath_caseindex, 0, 730)
(95,207 real changes made)

. replace died_0_730 = 0 if indextodeath_caseindex>730
(1,150,277 real changes made)

. replace died_0_730 = 0 if (indextodeath_caseindex>ttstudyend) &
(inrange(indextodeath_caseindex, 0, 730)) ///
>
& (inrange(ttstudyend, 0, 730))
(12,810 real changes made)


.
. * Died Day 91-730
. gen died_91_730 = .
(1,245,484 missing values generated)

. replace died_91_730 = 1 if inrange(indextodeath_caseindex, 91, 730)
(71,393 real changes made)

. replace died_91_730 = 0 if indextodeath_caseindex>730
(1,150,277 real changes made)

. replace died_91_730 = 0 if (indextodeath_caseindex>ttstudyend) &
(inrange(indextodeath_caseindex, 91, 730)) ///
>
& (inrange(ttstudyend, 91, 730))
>
(12,810 real changes made)


.
. *--------------------------
. * Time to Event Variables
. *--------------------------
.
. * alive on index day, censored at 90 days
. gen tte_0_90 = ttstudyend

. replace tte_0_90 = 90 if ttstudyend>90
```

```
(1,245,484 real changes made)

. replace tte_0_90 = indextodeath_caseindex  ///
>                                           if indextodeath_caseindex
indextodeath_caseindex<90
(23,659 real changes made)


.
. * alive on Day 91, censored at 180 days
. gen tte_91_180 = ttstudyend

. replace tte_91_180 = 180 if ttstudyend>180
(1,245,484 real changes made)

. replace tte_91_180 = indextodeath_caseindex if  ///
>                                                 indextodeath_caseindex
inrange(indextodeath_caseindex, 91, 180)
(12,195 real changes made)

. replace tte_91_180 = . if alive_day91==0
(23,814 real changes made, 23,814 to missing)


.
. * alive on Day 181, censored at 365 days
. gen tte_181_365 = ttstudyend

. replace tte_181_365 = 365 if ttstudyend>365
(1,191,419 real changes made)

. replace tte_181_365 = indextodeath_caseindex if         ///
>                                                 indextodeath_caseindex
inrange(indextodeath_caseindex, 181, 365)
(25,921 real changes made)

. replace tte_181_365 = . if alive_day181==0
(36,173 real changes made, 36,173 to missing)


.
. * alive on Day 366, censored at 730 days
. gen tte_366_730 = ttstudyend

. replace tte_366_730 = 730 if ttstudyend>730
(13,998 real changes made)

. replace tte_366_730 = indextodeath_caseindex if         ///
>                                                 indextodeath_caseindex
inrange(indextodeath_caseindex, 366, 730)
(20,049 real changes made)

. replace tte_366_730 = . if alive_day366==0
(114,374 real changes made, 114,374 to missing)

.
. * alive on index day, censored at 365 days
```

```
. gen tte_0_365 = ttstudyend

. replace tte_0_365 = 365 if ttstudyend>365
(1,191,419 real changes made)

. replace tte_0_365 = indextodeath_caseindex if ///
>                                                 indextodeath_caseindex
indextodeath_caseindex<365
(62,094 real changes made)


.
. * alive on index day, censored at 730 days
. gen tte_0_730 = ttstudyend

. replace tte_0_730 = 730 if ttstudyend>730
(13,998 real changes made)

. replace tte_0_730 = indextodeath_caseindex if ///
>                                                 indextodeath_caseindex
indextodeath_caseindex<730
(82,285 real changes made)


.
. * alive on Day 91, censored at 730 days
. gen tte_91_730 = ttstudyend

. replace tte_91_730 = 730 if ttstudyend>730
(13,998 real changes made)

. replace tte_91_730 = indextodeath_caseindex if  ///
>                                                 indextodeath_caseindex
inrange(indextodeath_caseindex, 91, 730)
(58,471 real changes made)

. replace tte_91_730 = . if alive_day91==0
(23,814 real changes made, 23,814 to missing)


.
. *-----------------------------------------------------------------
----------
. * for each period, identify whether the case and at least one
comparator
. * in a matched group are alive on the first day of the period
. *-----------------------------------------------------------------
----------
.
. ** Index Day, Day 0 **
.         * Each match group in dataset has at least one case and one
comparator alive
.         * on index day
.
. ** Alive on Day 91, 181, 366 **
.
. foreach i of numlist 91 181 366 {
```

```
  2.
.         //cases
.         gen alive_day`i'_case = 0
  3.         replace alive_day`i'_case = 1 if case==1 & alive_day`i'==1
  4.         replace alive_day`i'_case = 0 if case==1 & ttstudyend<`i'
  5.         tab alive_day`i'_case alive_day`i' if case==1
  6.         sum indextodeath if indextodeath<`i' & case==1
  7.
.         bysort matchgroupnumber: egen alive_day`i'_case_grp =
max(alive_day`i'_case)
  8.
.
.         //comparators
.         gen alive_day`i'_control = 0
  9.         replace alive_day`i'_control = 1 if case==0 &
alive_day`i'==1
 10.         replace alive_day`i'_control = 0 if case==0 &
ttstudyend<`i'
 11.
.         tab alive_day`i'_control alive_day`i' if case==0
 12.         sum indextodeath if indextodeath<`i' & case==0
 13.
.         bysort matchgroupnumber: egen alive_day`i'_control_num =
sum(alive_day`i'_control)
 14.
.         //case and at least one comparator alive on day`i'
.         gen alive_day`i'_casecontrol = 0
 15.         replace alive_day`i'_casecontrol = 1 if
alive_day`i'_case_grp==1 & alive_day`i'_control_num>=1
 16.
.         tab alive_day`i'_casecontrol case
 17.
.         //drop variables we no longer need
.         drop alive_day`i'_case alive_day`i'_case_grp
alive_day`i'_control alive_day`i'_control_num
 18.
. }
(195,646 real changes made)
(0 real changes made)

alive_day9 |      alive_day91
    1_case |         0          1 |     Total
-----------+----------------------+----------
         0 |    12,415          0 |    12,415
         1 |         0    195,646 |   195,646
-----------+----------------------+----------
     Total |    12,415    195,646 |   208,061

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     12,415    22.35747    19.79229          0         90
(1,026,024 real changes made)
(0 real changes made)
```

```
alive_day9 |      alive_day91
 1_control |         0          1 |     Total
-----------+----------------------+----------
         0 |    11,399          0 |    11,399
         1 |         0  1,026,024 | 1,026,024
-----------+----------------------+----------
     Total |    11,399  1,026,024 | 1,037,423

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     11,399      44.554    25.89809          0         90
(1,171,141 real changes made)

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
alive_day9 | covid-19 test result
1_casecont |          for
       rol |         0          1 |     Total
-----------+----------------------+----------
         0 |    61,924     12,419 |    74,343
         1 |   975,499    195,642 | 1,171,141
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
(193,602 real changes made)
(0 real changes made)

alive_day1 |     alive_day181
   81_case |         0          1 |     Total
-----------+----------------------+----------
         0 |    14,459          0 |    14,459
         1 |         0    193,602 |   193,602
-----------+----------------------+----------
     Total |    14,459    193,602 |   208,061

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     14,459    38.05222    43.91964          0        180
(1,015,709 real changes made)
(0 real changes made)

alive_day1 |     alive_day181
81_control |         0          1 |     Total
-----------+----------------------+----------
         0 |    21,714          0 |    21,714
         1 |         0  1,015,709 | 1,015,709
-----------+----------------------+----------
     Total |    21,714  1,015,709 | 1,037,423

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     21,714    87.84411    52.42273          0        180
(1,158,905 real changes made)
```

```
           |     indicator: is
           |  `index_dt` the date
           | of the first positive
alive_day1 | covid-19 test result
81_casecon |          for
      trol |         0          1 |     Total
-----------+----------------------+----------
         0 |    72,113     14,466 |    86,579
         1 |   965,310    193,595 | 1,158,905
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
(181,657 real changes made)
(0 real changes made)

alive_day3 |     alive_day366
   66_case |         0          1 |     Total
-----------+----------------------+----------
         0 |    26,404          0 |    26,404
         1 |         0    181,657 |   181,657
-----------+----------------------+----------
     Total |    26,404    181,657 |   208,061

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+--------------------------------------------------------
indextodea~x |     17,900    83.07486    103.0125          0        365
(949,453 real changes made)
(0 real changes made)

alive_day3 |     alive_day366
66_control |         0          1 |     Total
-----------+----------------------+----------
         0 |    87,970          0 |    87,970
         1 |         0    949,453 |   949,453
-----------+----------------------+----------
     Total |    87,970    949,453 | 1,037,423

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+--------------------------------------------------------
indextodea~x |     44,403       182.9    106.9272          0        365
(1,087,503 real changes made)

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
alive_day3 | covid-19 test result
66_casecon |          for
      trol |         0          1 |     Total
-----------+----------------------+----------
         0 |   131,567     26,414 |   157,981
         1 |   905,856    181,647 | 1,087,503
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
```

```
. * Save dataset for use in tables and Cox models
. *save Data\mortality_varforcox_20230516, replace
.
. *-----------------
. * ITT Results
. *-----------------
.
. use Data\mortality_varforcox_20230516, clear
(Created in file
'P:\ORD_Ioannou_202104007D\MethodsGroup\Programs\CORC_DataExplor)

.
. * excess deaths (Results)
. tab died_0_730 infected, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

           |       infected
died_0_730 |         0          1 |     Total
-----------+----------------------+----------
         0 |   975,435    187,652 | 1,163,087
           |     94.02      90.19 |     93.38
-----------+----------------------+----------
         1 |    61,988     20,409 |    82,397
           |      5.98       9.81 |      6.62
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
           |    100.00     100.00 |    100.00

.
. di 20409/208061 // 0.09809143 - mortality rate of cases
.09809143

. di 61988/1037423 // 0.0597519 - moratlity rate of comparators
.0597519

. di 208061*0.0597519 //12432.04 - number case deaths if comparator rate
12432.04

. di 20409-12432.04  //7976.96 excess deaths
7976.96

.
. * Overall *
.
. * 90-day mortality for cases and comparators who are alive on index
day
. tab died_0_90 infected  , co
```

```
+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

           |       infected
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,026,024    195,646 | 1,221,670
           |     98.90      94.03 |     98.09
-----------+----------------------+----------
         1 |    11,399     12,415 |    23,814
           |      1.10       5.97 |      1.91
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
           |    100.00     100.00 |    100.00

. cs died_0_90 infected

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |     12415       11399  |      23814
        Noncases |    195646     1026024  |    1221670
-----------------+------------------------+-----------
           Total |    208061     1037423  |    1245484
                 |                        |
            Risk |    .05967    .0109878  |   .0191203
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |         .0486822       |    .0476448    .0497196
      Risk ratio |         5.430567       |    5.296565    5.567959
 Attr. frac. ex. |         .8158572       |    .8111984     .820401
 Attr. frac. pop |         .4253324       |
                 +-------------------------------------------------
                              chi2(1) = 21899.73  Pr>chi2 = 0.0000

.
. * 180-day mortality for cases and comparators who are alive on day 91
&
. * with case and at least one comparator from matchgroup alive
. tab died_91_180 infected if alive_day91_casecontrol==1 , co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_91_18 |       infected
```

```
         0 |         0          1 |     Total
-----------+----------------------+----------
         0 |   955,483    193,598 | 1,149,081
           |     99.01      98.96 |     99.00
-----------+----------------------+----------
         1 |     9,514      2,044 |    11,558
           |      0.99       1.04 |      1.00
-----------+----------------------+----------
     Total |   964,997    195,642 | 1,160,639
           |    100.00     100.00 |    100.00

. cs died_91_180 infected if alive_day91_casecontrol==1

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      2044        9514  |      11558
       Noncases |    193598      955483  |    1149081
----------------+------------------------+-----------
          Total |    195642      964997  |    1160639
                |                        |
           Risk |  .0104477    .0098591  |   .0099583
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0005886       |    .0000968    .0010803
      Risk ratio |         1.059697       |    1.010503    1.111285
 Attr. frac. ex. |         .0563338       |    .0103938    .1001412
 Attr. frac. pop |         .0099625       |
                +-------------------------------------------------
                             chi2(1) =     5.72  Pr>chi2 = 0.0168

.
. * 365-day mortality for cases and comparators who are alive on day 181
& not censored
. tab died_181_365 infected if alive_day181_casecontrol==1 , co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_181_3 |       infected
        65 |         0          1 |     Total
-----------+----------------------+----------
         0 |   925,006    190,163 | 1,115,169
           |     97.82      98.23 |     97.89
-----------+----------------------+----------
         1 |    20,594      3,432 |    24,026
           |      2.18       1.77 |      2.11
-----------+----------------------+----------
     Total |   945,600    193,595 | 1,139,195
```

```
           |    100.00     100.00 |    100.00

. cs died_181_365 infected if alive_day181_casecontrol==1

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      3432       20594  |      24026
        Noncases |    190163      925006  |    1115169
-----------------+------------------------+-----------
           Total |    193595      945600  |    1139195
                 |                        |
            Risk |  .0177277    .0217788  |   .0210903
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |         -.004051       |   -.0047084   -.0033937
      Risk ratio |         .8139916       |    .7853629    .8436638
 Prev. frac. ex. |         .1860084       |    .1563362    .2146371
 Prev. frac. pop |         .0316103       |
                 +-------------------------------------------------
                              chi2(1) =   127.73  Pr>chi2 = 0.0000

.
. * 730-day mortality for cases and comparators who are alive on day 366
& not censored
. tab died_366_730 infected if alive_day366_casecontrol==1 , co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_366_7 |       infected
        30 |         0          1 |     Total
-----------+----------------------+----------
         0 |   852,355    179,130 | 1,031,485
           |     98.22      98.61 |     98.29
-----------+----------------------+----------
         1 |    15,481      2,517 |    17,998
           |      1.78       1.39 |      1.71
-----------+----------------------+----------
     Total |   867,836    181,647 | 1,049,483
           |    100.00     100.00 |    100.00

. cs died_366_730 infected if alive_day366_casecontrol==1

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      2517       15481  |      17998
        Noncases |    179130      852355  |    1031485
```

```
-----------------+-------------------------+-----------
           Total |    181647      867836   |    1049483
                 |                         |
            Risk |   .0138565    .0178386  |    .0171494
                 |                         |
                 |      Point estimate     |    [95% conf. interval]
                 |-------------------------+------------------------
 Risk difference |        -.0039821        |   -.0045875   -.0033767
      Risk ratio |         .7767721        |    .7449587    .8099442
 Prev. frac. ex. |         .2232279        |    .1900558    .2550413
 Prev. frac. pop |         .0386368        |
                 +-------------------------------------------------
                               chi2(1) =   141.31  Pr>chi2 = 0.0000


. 
. *-----------
. * Age <65
. *-----------
. 
. * 90-day mortality for cases and comparators who are alive on day 1
. tab died_0_90 infected if agecat==1 & ttstudyend>=0, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

           |       infected
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
         0 |   553,541    113,650 |   667,191
           |     99.70      98.79 |     99.54
-----------+----------------------+----------
         1 |     1,676      1,391 |     3,067
           |      0.30       1.21 |      0.46
-----------+----------------------+----------
     Total |   555,217    115,041 |   670,258
           |    100.00     100.00 |    100.00

. cs died_0_90 infected if agecat==1 & ttstudyend>=0

                 |        infected         |
                 |   Exposed   Unexposed   |      Total
-----------------+-------------------------+-----------
           Cases |      1391        1676   |       3067
        Noncases |    113650      553541   |     667191
-----------------+-------------------------+-----------
           Total |    115041      555217   |     670258
                 |                         |
            Risk |   .0120913    .0030186  |   .0045758
                 |                         |
                 |      Point estimate     |    [95% conf. interval]
```

```
                |-----------------------+-----------------------
 Risk difference |         .0090727      |    .0084249    .0097205
      Risk ratio |          4.00556      |    3.731753    4.299456
 Attr. frac. ex. |          .750347      |    .7320294    .7674125
 Attr. frac. pop |         .3403106      |
                +-------------------------------------------------
                            chi2(1) =  1722.13  Pr>chi2 = 0.0000

.
. * 180-day mortality for cases and comparators who are alive on day 91
. tab died_91_180 infected if alive_day91_casecontrol==1 & agecat==1 &
ttstudyend>=91, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_91_18 |       infected
         0 |         0          1 |     Total
-----------+----------------------+----------
         0 |   521,865    113,344 |   635,209
           |     99.73      99.73 |     99.73
-----------+----------------------+----------
         1 |     1,400        303 |     1,703
           |      0.27       0.27 |      0.27
-----------+----------------------+----------
     Total |   523,265    113,647 |   636,912
           |    100.00     100.00 |    100.00

. cs died_91_180 infected if alive_day91_casecontrol==1 & agecat==1 &
ttstudyend>=91

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       303        1400  |       1703
       Noncases |    113344      521865  |     635209
----------------+------------------------+-----------
          Total |    113647      523265  |     636912
                |                        |
           Risk |  .0026662    .0026755  |   .0026738
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+-----------------------
 Risk difference |        -9.36e-06       |   -.0003402    .0003215
      Risk ratio |         .9965023       |    .8802729    1.128078
 Prev. frac. ex. |         .0034977       |   -.1280784    .1197271
 Prev. frac. pop |         .0006241       |
                +-------------------------------------------------
                            chi2(1) =     0.00  Pr>chi2 = 0.9558
```

```
.
. * 365-day mortality for cases and comparators who are alive on day 181
& not censored
. tab died_181_365 infected if alive_day181_casecontrol==1 & agecat==1 &
ttstudyend>=181, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_181_3 |       infected
        65 |         0          1 |     Total
-----------+----------------------+----------
         0 |   513,794    112,816 |   626,610
           |     99.39      99.53 |     99.41
-----------+----------------------+----------
         1 |     3,178        528 |     3,706
           |      0.61       0.47 |      0.59
-----------+----------------------+----------
     Total |   516,972    113,344 |   630,316
           |    100.00     100.00 |    100.00

. cs died_181_365 infected if alive_day181_casecontrol==1 & agecat==1 &
ttstudyend>=181

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       528        3178  |       3706
       Noncases |    112816      513794  |     626610
----------------+------------------------+-----------
          Total |    113344      516972  |     630316
                |                        |
           Risk |  .0046584    .0061473  |   .0058796
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0014889       |    -.001939   -.0010389
      Risk ratio |         .7577894       |    .6912628    .8307184
 Prev. frac. ex. |         .2422106       |    .1692816    .3087372
 Prev. frac. pop |         .0435545       |
                +-------------------------------------------------
                             chi2(1) =    35.26  Pr>chi2 = 0.0000


.
. * 730-day mortality for cases and comparators who are alive on day 366
& not censored
. tab died_366_730 infected if alive_day366_casecontrol==1 & agecat==1 &
ttstudyend>=366, co

+-------------------+
```

```
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_366_7 |       infected
        30 |         0          1 |     Total
-----------+----------------------+----------
         0 |   476,993    106,579 |   583,572
           |     99.51      99.64 |     99.53
-----------+----------------------+----------
         1 |     2,364        390 |     2,754
           |      0.49       0.36 |      0.47
-----------+----------------------+----------
     Total |   479,357    106,969 |   586,326
           |    100.00     100.00 |    100.00

. cs died_366_730 infected if alive_day366_casecontrol==1 & agecat==1 &
ttstudyend>=366

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       390        2364  |       2754
       Noncases |    106579      476993  |     583572
----------------+------------------------+-----------
          Total |    106969      479357  |     586326
                |                        |
           Risk |  .0036459    .0049316  |    .004697
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0012857       |   -.0016977   -.0008736
      Risk ratio |         .7392959       |    .6643324    .8227183
 Prev. frac. ex. |         .2607041       |    .1772817    .3356676
 Prev. frac. pop |         .0475627       |
                +-------------------------------------------------
                             chi2(1) =    30.92  Pr>chi2 = 0.0000


.
. *------------
. * Age 65-85
. *------------
.
. * 90-day mortality for cases and comparators who are alive on day 1
. tab died_0_90 infected if agecat==2 & ttstudyend>=0, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+
```

```
           |       infected
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
         0 |   424,483     74,472 |   498,955
           |     98.42      90.49 |     97.15
-----------+----------------------+----------
         1 |     6,818      7,829 |    14,647
           |      1.58       9.51 |      2.85
-----------+----------------------+----------
     Total |   431,301     82,301 |   513,602
           |    100.00     100.00 |    100.00

. cs died_0_90 infected if agecat==2 & ttstudyend>=0

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      7829        6818  |      14647
       Noncases |     74472      424483  |     498955
----------------+------------------------+-----------
          Total |     82301      431301  |     513602
                |                        |
           Risk |  .0951264     .015808  |   .0285182
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0793184       |    .0772797    .0813571
      Risk ratio |         6.017618       |    5.830439    6.210807
 Attr. frac. ex. |         .8338213       |    .8284863    .8389903
 Attr. frac. pop |         .4456876       |
                +-------------------------------------------------
                              chi2(1) = 15694.61  Pr>chi2 = 0.0000

.
. * 180-day mortality for cases and comparators who are alive on day 91
. tab died_91_180 infected if alive_day91_casecontrol==1 & agecat==2 &
ttstudyend>=91, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_91_18 |       infected
         0 |         0          1 |     Total
-----------+----------------------+----------
         0 |   391,280     73,211 |   464,491
           |     98.55      98.31 |     98.51
-----------+----------------------+----------
         1 |     5,753      1,260 |     7,013
           |      1.45       1.69 |      1.49
```

```
-----------+----------------------+----------
     Total |   397,033     74,471 |   471,504
           |    100.00     100.00 |    100.00

. cs died_91_180 infected if alive_day91_casecontrol==1 & agecat==2 &
ttstudyend>=91

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1260        5753  |       7013
       Noncases |     73211      391280  |     464491
----------------+------------------------+-----------
          Total |     74471      397033  |     471504
                |                        |
           Risk |  .0169193      .01449  |   .0148737
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0024294       |    .0014313    .0034274
      Risk ratio |         1.167658       |    1.099154    1.240431
 Attr. frac. ex. |         .1435847       |    .0902098    .1938283
 Attr. frac. pop |         .0257973       |
                +-------------------------------------------------
                             chi2(1) =    25.26  Pr>chi2 = 0.0000

.
. * 365-day mortality for cases and comparators who are alive on day 181
& not censored
. tab died_181_365 infected if alive_day181_casecontrol==1 & agecat==2 &
ttstudyend>=181, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_181_3 |       infected
        65 |         0          1 |     Total
-----------+----------------------+----------
         0 |   374,071     71,093 |   445,164
           |     96.70      97.11 |     96.77
-----------+----------------------+----------
         1 |    12,754      2,116 |    14,870
           |      3.30       2.89 |      3.23
-----------+----------------------+----------
     Total |   386,825     73,209 |   460,034
           |    100.00     100.00 |    100.00

. cs died_181_365 infected if alive_day181_casecontrol==1 & agecat==2 &
ttstudyend>=181
```

```
                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      2116       12754  |      14870
        Noncases |     71093      374071  |     445164
-----------------+------------------------+-----------
           Total |     73209      386825  |     460034
                 |                        |
            Risk |  .0289036     .032971  |   .0323237
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |        -.0040674       |   -.0054051   -.0027297
      Risk ratio |          .876636       |    .8377907    .9172825
 Prev. frac. ex. |          .123364       |    .0827175    .1622093
 Prev. frac. pop |         .0196319       |
                 +-------------------------------------------------
                              chi2(1) =    32.56  Pr>chi2 = 0.0000

.
. * 730-day mortality for cases and comparators who are alive on day 366
& not censored
. tab died_366_730 infected if alive_day366_casecontrol==1 & agecat==2 &
ttstudyend>=366, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_366_7 |       infected
        30 |         0          1 |     Total
-----------+----------------------+----------
         0 |   343,610     67,016 |   410,626
           |     97.29      97.69 |     97.36
-----------+----------------------+----------
         1 |     9,562      1,586 |    11,148
           |      2.71       2.31 |      2.64
-----------+----------------------+----------
     Total |   353,172     68,602 |   421,774
           |    100.00     100.00 |    100.00

. cs died_366_730 infected if alive_day366_casecontrol==1 & agecat==2 &
ttstudyend>=366

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      1586        9562  |      11148
        Noncases |     67016      343610  |     410626
-----------------+------------------------+-----------
           Total |     68602      353172  |     421774
```

```
                |                           |
           Risk |  .0231189    .0270746     |   .0264312
                |                           |
                |      Point estimate       |    [95% conf. interval]
                |---------------------------+------------------------
 Risk difference |        -.0039558          |   -.0052012   -.0027103
      Risk ratio |         .8538939          |    .8102154    .8999272
 Prev. frac. ex. |         .1461061          |    .1000728    .1897846
 Prev. frac. pop |         .0237643          |
                +-------------------------------------------------
                             chi2(1) =    34.93  Pr>chi2 = 0.0000

.
. *------------
. * Age 85+
. *------------
.
. * 90-day mortality for cases and comparators who are alive on day 1
. tab died_0_90 infected if agecat==3 & ttstudyend>=0, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

           |       infected
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
         0 |    48,000      7,524 |    55,524
           |     94.29      70.19 |     90.10
-----------+----------------------+----------
         1 |     2,905      3,195 |     6,100
           |      5.71      29.81 |      9.90
-----------+----------------------+----------
     Total |    50,905     10,719 |    61,624
           |    100.00     100.00 |    100.00

. cs died_0_90 infected if agecat==3 & ttstudyend>=0

                |        infected           |
                |   Exposed   Unexposed     |      Total
----------------+---------------------------+-----------
          Cases |      3195        2905     |       6100
       Noncases |      7524       48000     |      55524
----------------+---------------------------+-----------
          Total |     10719       50905     |      61624
                |                           |
           Risk |  .2980688    .0570671     |   .0989874
                |                           |
                |      Point estimate       |    [95% conf. interval]
                |---------------------------+------------------------
 Risk difference |         .2410018          |    .2321112    .2498923
```

```
      Risk ratio |         5.223131       |    4.989677    5.467507
 Attr. frac. ex. |         .8085439       |    .7995862    .8171013
 Attr. frac. pop |         .4234915       |
                 +-------------------------------------------------
                                  chi2(1) =  5766.26  Pr>chi2 = 0.0000

.
. * 180-day mortality for cases and comparators who are alive on day 91
. tab died_91_180 infected if alive_day91_casecontrol==1 & agecat==3 &
ttstudyend>=91, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_91_18 |       infected
         0 |         0          1 |     Total
-----------+----------------------+----------
         0 |    42,338      7,043 |    49,381
           |     94.72      93.61 |     94.56
-----------+----------------------+----------
         1 |     2,361        481 |     2,842
           |      5.28       6.39 |      5.44
-----------+----------------------+----------
     Total |    44,699      7,524 |    52,223
           |    100.00     100.00 |    100.00

. cs died_91_180 infected if alive_day91_casecontrol==1 & agecat==3 &
ttstudyend>=91

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       481        2361  |       2842
       Noncases |      7043       42338  |      49381
----------------+------------------------+-----------
          Total |      7524       44699  |      52223
                |                        |
           Risk |  .0639288      .05282  |   .0544205
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0111088       |    .0052052    .0170124
      Risk ratio |         1.210314       |    1.100674    1.330876
 Attr. frac. ex. |         .1737682       |    .0914654    .2486153
 Attr. frac. pop |         .0294098       |
                 +-------------------------------------------------
                                  chi2(1) =    15.44  Pr>chi2 = 0.0001

.
. * 365-day mortality for cases and comparators who are alive on day 181
```

```
& not censored
. tab died_181_365 infected if alive_day181_casecontrol==1 & agecat==3 &
ttstudyend>=181, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_181_3 |       infected
        65 |         0          1 |     Total
-----------+----------------------+----------
         0 |    37,141      6,254 |    43,395
           |     88.85      88.81 |     88.84
-----------+----------------------+----------
         1 |     4,662        788 |     5,450
           |     11.15      11.19 |     11.16
-----------+----------------------+----------
     Total |    41,803      7,042 |    48,845
           |    100.00     100.00 |    100.00

. cs died_181_365 infected if alive_day181_casecontrol==1 & agecat==3 &
ttstudyend>=181

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       788        4662  |       5450
       Noncases |      6254       37141  |      43395
----------------+------------------------+-----------
          Total |      7042       41803  |      48845
                |                        |
           Risk |     .1119    .1115231  |   .1115774
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0003769       |   -.0075803    .0083341
      Risk ratio |          1.00338       |    .9344751    1.077365
 Attr. frac. ex. |         .0033685       |   -.0701195    .0718098
 Attr. frac. pop |          .000487       |
                +-------------------------------------------------
                              chi2(1) =     0.01  Pr>chi2 = 0.9260

.
. * 730-day mortality for cases and comparators who are alive on day 366
& not censored
. tab died_366_730 infected if alive_day366_casecontrol==1 & agecat==3 &
ttstudyend>=366, co

+-------------------+
| Key               |
|-------------------|
```

```
|     frequency     |
| column percentage |
+-------------------+

died_366_7 |       infected
        30 |         0          1 |     Total
-----------+----------------------+----------
         0 |    31,752      5,535 |    37,287
           |     89.93      91.10 |     90.10
-----------+----------------------+----------
         1 |     3,555        541 |     4,096
           |     10.07       8.90 |      9.90
-----------+----------------------+----------
     Total |    35,307      6,076 |    41,383
           |    100.00     100.00 |    100.00

. cs died_366_730 infected if alive_day366_casecontrol==1 & agecat==3 &
ttstudyend>=366

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       541        3555  |       4096
       Noncases |      5535       31752  |      37287
----------------+------------------------+-----------
          Total |      6076       35307  |      41383
                |                        |
           Risk |  .0890388    .1006882  |   .0989778
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0116494       |   -.0194682   -.0038306
      Risk ratio |         .8843022       |    .8112224    .9639655
 Prev. frac. ex. |         .1156978       |    .0360345    .1887776
 Prev. frac. pop |         .0169872       |
                +-------------------------------------------------
                             chi2(1) =     7.89  Pr>chi2 = 0.0050


.
. *-----------
. * Wave 1
. *-----------
.
. * 90-day mortality for cases and comparators who are alive on day 1
. tab died_0_90 infected if wave==1 & ttstudyend>=0, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

           |       infected
```

```
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
         0 |    99,999     18,259 |   118,258
           |     98.48      89.80 |     97.03
-----------+----------------------+----------
         1 |     1,547      2,075 |     3,622
           |      1.52      10.20 |      2.97
-----------+----------------------+----------
     Total |   101,546     20,334 |   121,880
           |    100.00     100.00 |    100.00

. cs died_0_90 infected if wave==1 & ttstudyend>=0

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      2075        1547  |       3622
       Noncases |     18259       99999  |     118258
----------------+------------------------+-----------
          Total |     20334      101546  |     121880
                |                        |
           Risk |  .1020458    .0152345  |   .0297178
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0868114       |    .0825831    .0910397
      Risk ratio |         6.698349       |     6.28251    7.141713
 Attr. frac. ex. |         .8507095       |     .840828    .8599776
 Attr. frac. pop |         .4873612       |
                +-------------------------------------------------
                             chi2(1) =  4427.84  Pr>chi2 = 0.0000

.
. * 180-day mortality for cases and comparators who are alive on day 91
. tab died_91_180 infected if alive_day91_casecontrol==1 & wave==1 &
ttstudyend>=91, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_91_18 |       infected
         0 |         0          1 |     Total
-----------+----------------------+----------
         0 |    88,661     17,947 |   106,608
           |     98.65      98.29 |     98.59
-----------+----------------------+----------
         1 |     1,217        312 |     1,529
           |      1.35       1.71 |      1.41
-----------+----------------------+----------
     Total |    89,878     18,259 |   108,137
```

```
           |    100.00     100.00 |    100.00

. cs died_91_180 infected if alive_day91_casecontrol==1 & wave==1 &
ttstudyend>=91

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |       312        1217  |       1529
        Noncases |     17947       88661  |     106608
-----------------+------------------------+-----------
           Total |     18259       89878  |     108137
                 |                        |
            Risk |  .0170875    .0135406  |   .0141395
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |         .0035469       |    .0015209    .0055728
      Risk ratio |         1.261945       |    1.115499    1.427617
 Attr. frac. ex. |         .2075724       |    .1035404    .2995318
 Attr. frac. pop |         .0423562       |
                 +-------------------------------------------------
                              chi2(1) =    13.70  Pr>chi2 = 0.0002

.
. * 365-day mortality for cases and comparators who are alive on day 181
& not censored
. tab died_181_365 infected if alive_day181_casecontrol==1 & wave==1 &
ttstudyend>=181, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_181_3 |       infected
        65 |         0          1 |     Total
-----------+----------------------+----------
         0 |    84,668     17,491 |   102,159
           |     97.13      97.47 |     97.19
-----------+----------------------+----------
         1 |     2,501        454 |     2,955
           |      2.87       2.53 |      2.81
-----------+----------------------+----------
     Total |    87,169     17,945 |   105,114
           |    100.00     100.00 |    100.00

. cs died_181_365 infected if alive_day181_casecontrol==1 & wave==1 &
ttstudyend>=181

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
```

```
-----------------+------------------------+-----------
           Cases |       454        2501  |       2955
        Noncases |     17491       84668  |     102159
-----------------+------------------------+-----------
           Total |     17945       87169  |     105114
                 |                        |
            Risk |   .0252995    .0286914  |   .0281123
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |        -.0033919       |   -.0059427    -.000841
      Risk ratio |         .8817811       |    .7989165    .9732404
 Prev. frac. ex. |         .1182189       |    .0267596    .2010835
 Prev. frac. pop |         .0201823       |
                 +-----------------------------------------------
                              chi2(1) =     6.27  Pr>chi2 = 0.0123
```

```
.
. * 730-day mortality for cases and comparators who are alive on day 366
& not censored
. tab died_366_730 infected if alive_day366_casecontrol==1 & wave==1 &
ttstudyend>=181, co
```

```
+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_366_7 |       infected
        30 |         0          1 |     Total
-----------+----------------------+----------
         0 |    78,914     16,785 |    95,699
           |     95.53      95.96 |     95.60
-----------+----------------------+----------
         1 |     3,694        706 |     4,400
           |      4.47       4.04 |      4.40
-----------+----------------------+----------
     Total |    82,608     17,491 |   100,099
           |    100.00     100.00 |    100.00
```

```
. cs died_366_730 infected if alive_day366_casecontrol==1 & wave==1 &
ttstudyend>=181

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |       706        3694  |       4400
        Noncases |     16785       78914  |      95699
-----------------+------------------------+-----------
           Total |     17491       82608  |     100099
                 |                        |
            Risk |   .0403636    .0447172  |   .0439565
```

```
                |                         |
                |      Point estimate     |    [95% conf. interval]
                |-------------------------+------------------------
 Risk difference |        -.0043536        |    -.007593   -.0011142
      Risk ratio |         .9026415        |    .8342144    .9766813
 Prev. frac. ex. |         .0973585        |    .0233187    .1657856
 Prev. frac. pop |         .0170121        |
                +-------------------------------------------------
                             chi2(1) =     6.51  Pr>chi2 = 0.0107

.
. *-----------
. * Wave 2
. *-----------
.
. * 90-day mortality for cases and comparators who are alive on day 1
. tab died_0_90 infected if wave==2 & ttstudyend>=0, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

           |       infected
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
         0 |   360,765     68,942 |   429,707
           |     98.86      94.21 |     98.08
-----------+----------------------+----------
         1 |     4,167      4,239 |     8,406
           |      1.14       5.79 |      1.92
-----------+----------------------+----------
     Total |   364,932     73,181 |   438,113
           |    100.00     100.00 |    100.00

. cs died_0_90 infected if wave==2 & ttstudyend>=0

                |        infected         |
                |   Exposed   Unexposed   |      Total
----------------+-------------------------+-----------
          Cases |      4239        4167   |       8406
       Noncases |     68942      360765   |     429707
----------------+-------------------------+-----------
          Total |     73181      364932   |     438113
                |                         |
           Risk |  .0579249    .0114186   |   .0191868
                |                         |
                |      Point estimate     |    [95% conf. interval]
                |-------------------------+------------------------
 Risk difference |         .0465063        |    .0447791    .0482335
      Risk ratio |         5.072868        |    4.864157    5.290533
 Attr. frac. ex. |         .8028728        |    .7944145    .8109831
```

```
 Attr. frac. pop |         .4048748       |
                 +-------------------------------------------------
                                chi2(1) =  7005.81  Pr>chi2 = 0.0000

.
. * 180-day mortality for cases and comparators who are alive on day 91
. tab died_91_180 infected if alive_day91_casecontrol==1 & wave==2 &
ttstudyend>=91, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_91_18 |       infected
         0 |         0          1 |     Total
-----------+----------------------+----------
         0 |   336,264     68,230 |   404,494
           |     98.93      98.97 |     98.94
-----------+----------------------+----------
         1 |     3,633        712 |     4,345
           |      1.07       1.03 |      1.06
-----------+----------------------+----------
     Total |   339,897     68,942 |   408,839
           |    100.00     100.00 |    100.00

. cs died_91_180 infected if alive_day91_casecontrol==1 & wave==2 &
ttstudyend>=91

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       712        3633  |       4345
       Noncases |     68230      336264  |     404494
----------------+------------------------+-----------
          Total |     68942      339897  |     408839
                |                        |
           Risk |  .0103275    .0106885  |   .0106277
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         -.000361       |   -.0011911    .0004691
     Risk ratio |         .9662245       |    .8920176    1.046605
 Prev. frac. ex. |         .0337755       |   -.0466047    .1079824
 Prev. frac. pop |         .0056955       |
                 +-------------------------------------------------
                                chi2(1) =     0.71  Pr>chi2 = 0.3993

.
. * 365-day mortality for cases and comparators who are alive on day 181
& not censored
. tab died_181_365 infected if alive_day181_casecontrol==1 & wave==2 &
```

```
ttstudyend>=181, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_181_3 |       infected
        65 |         0          1 |     Total
-----------+----------------------+----------
         0 |   326,114     67,092 |   393,206
           |     97.99      98.33 |     98.05
-----------+----------------------+----------
         1 |     6,695      1,137 |     7,832
           |      2.01       1.67 |      1.95
-----------+----------------------+----------
     Total |   332,809     68,229 |   401,038
           |    100.00     100.00 |    100.00

. cs died_181_365 infected if alive_day181_casecontrol==1 & wave==2 &
ttstudyend>=181

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1137        6695  |       7832
       Noncases |     67092      326114  |     393206
----------------+------------------------+-----------
          Total |     68229      332809  |     401038
                |                        |
           Risk |  .0166645    .0201166  |   .0195293
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0034522       |   -.0045246   -.0023797
      Risk ratio |         .8283921       |    .7783378    .8816653
 Prev. frac. ex. |         .1716079       |    .1183347    .2216622
 Prev. frac. pop |         .0291958       |
                +-------------------------------------------------
                             chi2(1) =    35.24  Pr>chi2 = 0.0000

.
. * 730-day mortality for cases and comparators who are alive on day 366
& not censored
. tab died_366_730 infected if alive_day366_casecontrol==1 & wave==2 &
ttstudyend>=366, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
```

```
+-------------------+

died_366_7 |       infected
        30 |         0          1 |     Total
-----------+----------------------+----------
         0 |   313,659     66,001 |   379,660
           |     97.79      98.37 |     97.89
-----------+----------------------+----------
         1 |     7,098      1,091 |     8,189
           |      2.21       1.63 |      2.11
-----------+----------------------+----------
     Total |   320,757     67,092 |   387,849
           |    100.00     100.00 |    100.00

. cs died_366_730 infected if alive_day366_casecontrol==1 & wave==2 &
ttstudyend>=366

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1091        7098  |       8189
       Noncases |     66001      313659  |     379660
----------------+------------------------+-----------
          Total |     67092      320757  |     387849
                |                        |
           Risk |  .0162613    .0221289  |   .0211139
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0058676       |   -.0069517   -.0047836
      Risk ratio |         .7348423       |    .6898441    .7827757
 Prev. frac. ex. |         .2651577       |    .2172243    .3101559
 Prev. frac. pop |         .0458683       |
                +-------------------------------------------------
                             chi2(1) =    92.43  Pr>chi2 = 0.0000

.
. *-----------
. * Wave 3
. *-----------
.
. * 90-day mortality for cases and comparators who are alive on day 1
. tab died_0_90 infected if wave==3 & ttstudyend>=0, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

           |       infected
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
```

```
          0 |   565,260    108,445 |   673,705
            |     99.00      94.67 |     98.28
------------+----------------------+----------
          1 |     5,685      6,101 |    11,786
            |      1.00       5.33 |      1.72
------------+----------------------+----------
      Total |   570,945    114,546 |   685,491
            |    100.00     100.00 |    100.00

. cs died_0_90 infected if wave==3 & ttstudyend>=0

                |       infected        |
                |   Exposed   Unexposed |      Total
----------------+-----------------------+-----------
          Cases |      6101        5685 |      11786
       Noncases |    108445      565260 |     673705
----------------+-----------------------+-----------
          Total |    114546      570945 |     685491
                |                       |
           Risk |  .0532624    .0099572 |   .0171935
                |                       |
                |      Point estimate   |    [95% conf. interval]
                |-----------------------+------------------------
 Risk difference |         .0433053      |    .0419796    .0446309
      Risk ratio |         5.349152      |    5.162236    5.542835
 Attr. frac. ex. |         .8130545      |    .8062855    .8195869
 Attr. frac. pop |         .4208761      |
                +-------------------------------------------------
                             chi2(1) = 10588.18  Pr>chi2 = 0.0000

.
. * 180-day mortality for cases and comparators who are alive on day 91
. tab died_91_180 infected if alive_day91_casecontrol==1 & wave==3 &
ttstudyend>=91, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_91_18 |       infected
          0 |         0          1 |     Total
------------+----------------------+----------
          0 |   530,558    107,421 |   637,979
            |     99.13      99.06 |     99.12
------------+----------------------+----------
          1 |     4,664      1,020 |     5,684
            |      0.87       0.94 |      0.88
------------+----------------------+----------
      Total |   535,222    108,441 |   643,663
            |    100.00     100.00 |    100.00
```

```
. cs died_91_180 infected if alive_day91_casecontrol==1 & wave==3 &
ttstudyend>=91

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1020        4664  |       5684
       Noncases |    107421      530558  |     637979
----------------+------------------------+-----------
          Total |    108441      535222  |     643663
                |                        |
           Risk |   .009406    .0087141  |   .0088307
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0006919       |    .0000657     .001318
     Risk ratio |         1.079399       |    1.009012    1.154696
 Attr. frac. ex. |         .0735587       |    .0089317    .1339714
 Attr. frac. pop |         .0132002       |
                +-------------------------------------------------
                             chi2(1) =     4.93  Pr>chi2 = 0.0264

.
. * 365-day mortality for cases and comparators who are alive on day 181
& not censored
. tab died_181_365 infected if alive_day181_casecontrol==1 & wave==3 &
ttstudyend>=181, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_181_3 |       infected
        65 |         0          1 |     Total
-----------+----------------------+----------
         0 |   514,224    105,580 |   619,804
           |     97.83      98.29 |     97.91
-----------+----------------------+----------
         1 |    11,398      1,841 |    13,239
           |      2.17       1.71 |      2.09
-----------+----------------------+----------
     Total |   525,622    107,421 |   633,043
           |    100.00     100.00 |    100.00

. cs died_181_365 infected if alive_day181_casecontrol==1 & wave==3 &
ttstudyend>=181

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1841       11398  |      13239
```

```
        Noncases |    105580      514224  |     619804
-----------------+-------------------------+-----------
           Total |    107421      525622  |     633043
                 |                         |
            Risk |   .0171382    .0216848  |   .0209133
                 |                         |
                 |      Point estimate     |    [95% conf. interval]
                 |-------------------------+------------------------
 Risk difference |        -.0045466        |   -.0054169   -.0036763
      Risk ratio |         .7903318        |    .7526963    .8298492
 Prev. frac. ex. |         .2096682        |    .1701508    .2473037
 Prev. frac. pop |         .0355786        |
                 +-------------------------------------------------
                              chi2(1) =    90.05  Pr>chi2 = 0.0000

.
. * 730-day mortality for cases and comparators who are alive on day 366
& not censored
. tab died_366_730 infected if alive_day366_casecontrol==1 & wave==3 &
ttstudyend>=366, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_366_7 |       infected
        30 |         0          1 |     Total
-----------+----------------------+----------
         0 |   459,782     96,344 |   556,126
           |     98.99      99.26 |     99.04
-----------+----------------------+----------
         1 |     4,689        720 |     5,409
           |      1.01       0.74 |      0.96
-----------+----------------------+----------
     Total |   464,471     97,064 |   561,535
           |    100.00     100.00 |    100.00

. cs died_366_730 infected if alive_day366_casecontrol==1 & wave==3 &
ttstudyend>=366

                 |        infected         |
                 |   Exposed   Unexposed   |      Total
-----------------+-------------------------+-----------
           Cases |       720        4689   |       5409
        Noncases |     96344      459782   |     556126
-----------------+-------------------------+-----------
           Total |     97064      464471   |     561535
                 |                         |
            Risk |   .0074178    .0100954  |   .0096325
                 |                         |
                 |      Point estimate     |    [95% conf. interval]
```

```
                |-----------------------+-----------------------
 Risk difference |        -.0026776      |   -.0032892    -.002066
      Risk ratio |         .7347721      |     .679539    .7944946
 Prev. frac. ex. |         .2652279      |    .2055054     .320461
 Prev. frac. pop |         .0458459      |
                +-------------------------------------------------
                              chi2(1) =    60.34  Pr>chi2 = 0.0000

.
.
. *-------------------------------------------------------
. * Overall for comparators by later infection status
. *-------------------------------------------------------
.
. tab isfutureinfectedcontrol case , co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

indicator: |
    is the |
patienticn |
        an |     indicator: is
uninfected |  `index_dt` the date
control in | of the first positive
  the 25:1 | covid-19 test result
   matched |          for
 cohort wh |         0          1 |     Total
-----------+----------------------+----------
         0 |   900,097    208,061 | 1,108,158
           |     86.76     100.00 |     88.97
-----------+----------------------+----------
         1 |   137,326          0 |   137,326
           |     13.24       0.00 |     11.03
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
           |    100.00     100.00 |    100.00

. tab isfutureinfectedcontrol case if alive_day91, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

indicator: |
    is the |
patienticn |
```

```
        an |     indicator: is
uninfected |  `index_dt` the date
control in | of the first positive
  the 25:1 | covid-19 test result
   matched |          for
 cohort wh |         0          1 |     Total
-----------+----------------------+----------
         0 |   889,988    195,646 | 1,085,634
           |     86.74     100.00 |     88.86
-----------+----------------------+----------
         1 |   136,036          0 |   136,036
           |     13.26       0.00 |     11.14
-----------+----------------------+----------
     Total | 1,026,024    195,646 | 1,221,670
           |    100.00     100.00 |    100.00
```

```
. tab isfutureinfectedcontrol case if alive_day181, co
```

```
+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage |
+--------------------+
```

```
indicator: |
    is the |
patienticn |
        an |     indicator: is
uninfected |  `index_dt` the date
control in | of the first positive
  the 25:1 | covid-19 test result
   matched |          for
 cohort wh |         0          1 |     Total
-----------+----------------------+----------
         0 |   881,032    193,602 | 1,074,634
           |     86.74     100.00 |     88.86
-----------+----------------------+----------
         1 |   134,677          0 |   134,677
           |     13.26       0.00 |     11.14
-----------+----------------------+----------
     Total | 1,015,709    193,602 | 1,209,311
           |    100.00     100.00 |    100.00
```

```
. tab isfutureinfectedcontrol case if alive_day366, co
```

```
+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage |
+--------------------+
```

```
indicator: |
```

```
    is the |
patienticn |
        an |     indicator: is
uninfected |  `index_dt` the date
control in | of the first positive
  the 25:1 | covid-19 test result
   matched |          for
 cohort wh |         0          1 |     Total
-----------+----------------------+----------
         0 |   823,199    181,657 | 1,004,856
           |     86.70     100.00 |     88.84
-----------+----------------------+----------
         1 |   126,254          0 |   126,254
           |     13.30       0.00 |     11.16
-----------+----------------------+----------
     Total |   949,453    181,657 | 1,131,110
           |    100.00     100.00 |    100.00
```

```
.
. * 90-day mortality for comparators by later infection status who are
alive on index date
. tab died_0_90 isfutureinfectedcontrol if infected==0 & ttstudyend>=0,
co
```

```
+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

           |   indicator: is the
           |     patienticn an
           | uninfected control in
           |   the 25:1 matched
           |       cohort wh
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
         0 |   889,988    136,036 | 1,026,024
           |     98.88      99.06 |     98.90
-----------+----------------------+----------
         1 |    10,109      1,290 |    11,399
           |      1.12       0.94 |      1.10
-----------+----------------------+----------
     Total |   900,097    137,326 | 1,037,423
           |    100.00     100.00 |    100.00
```

```
. cs died_0_90 isfutureinfectedcontrol if infected==0 & ttstudyend>=0

                 | indicator: is the      |
                 | patienticn an          |
                 | uninfected control in  |
                 | the 25:1 matched       |
                 | cohort wh              |
```

```
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      1290       10109  |      11399
        Noncases |    136036      889988  |    1026024
-----------------+------------------------+-----------
           Total |    137326      900097  |    1037423
                 |                        |
            Risk |  .0093937     .011231  |   .0109878
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |        -.0018373       |    -.002392   -.0012826
      Risk ratio |         .8364078       |     .789538    .8860599
 Prev. frac. ex. |         .1635922       |    .1139401     .210462
 Prev. frac. pop |         .0216551       |
                 +-------------------------------------------------
                              chi2(1) =    37.01  Pr>chi2 = 0.0000

.
. * 180-day mortality for comparators by later infection status who are
alive on day 91
. tab died_91_180 isfutureinfectedcontrol if infected==0 &
alive_day91==1 & ttstudyend>=91, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

           |   indicator: is the
           |     patienticn an
           | uninfected control in
           |   the 25:1 matched
died_91_18 |       cohort wh
         0 |         0          1 |     Total
-----------+----------------------+----------
         0 |   881,032    134,677 | 1,015,709
           |     98.99      99.00 |     98.99
-----------+----------------------+----------
         1 |     8,956      1,359 |    10,315
           |      1.01       1.00 |      1.01
-----------+----------------------+----------
     Total |   889,988    136,036 | 1,026,024
           |    100.00     100.00 |    100.00

. cs died_91_180 isfutureinfectedcontrol if infected==0 & alive_day91==1
& ttstudyend>=91

                 | indicator: is the      |
                 | patienticn an          |
                 | uninfected control in  |
                 | the 25:1 matched       |
```

```
                | cohort wh             |
                |   Exposed   Unexposed |      Total
----------------+-----------------------+-----------
          Cases |      1359        8956 |      10315
       Noncases |    134677      881032 |    1015709
----------------+-----------------------+-----------
          Total |    136036      889988 |    1026024
                |                       |
           Risk |    .00999    .0100631 |   .0100534
                |                       |
                |      Point estimate   |    [95% conf. interval]
                |-----------------------+------------------------
 Risk difference |        -.0000731      |   -.0006408    .0004946
     Risk ratio |         .9927403      |    .9379505    1.050731
 Prev. frac. ex. |         .0072597      |   -.0507307    .0620495
 Prev. frac. pop |         .0009625      |
                +-------------------------------------------------
                             chi2(1) =     0.06  Pr>chi2 = 0.8014

.
. * 365-day mortality for comparators by later infection status who are
alive on day 181 & not censored
. tab died_181_365 isfutureinfectedcontrol if infected==0 &
alive_day181==1 & ttstudyend>=181, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

           |   indicator: is the
           |     patienticn an
           | uninfected control in
           |   the 25:1 matched
died_181_3 |       cohort wh
        65 |         0          1 |     Total
-----------+----------------------+----------
         0 |   862,422    130,652 |   993,074
           |     97.89      97.01 |     97.77
-----------+----------------------+----------
         1 |    18,610      4,025 |    22,635
           |      2.11       2.99 |      2.23
-----------+----------------------+----------
     Total |   881,032    134,677 | 1,015,709
           |    100.00     100.00 |    100.00

. cs died_181_365 isfutureinfectedcontrol if infected==0 &
alive_day181==1 & ttstudyend>=181

                | indicator: is the      |
                | patienticn an          |
                | uninfected control in  |
```

```
                | the 25:1 matched       |
                | cohort wh              |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      4025       18610  |      22635
       Noncases |    130652      862422  |     993074
----------------+------------------------+-----------
          Total |    134677      881032  |    1015709
                |                        |
           Risk |  .0298863     .021123  |   .0222849
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0087634       |    .0078057     .009721
      Risk ratio |         1.414874       |    1.368145    1.463199
 Attr. frac. ex. |         .2932233       |    .2690833     .316566
 Attr. frac. pop |         .0521415       |
                +-------------------------------------------------
                              chi2(1) =   411.75  Pr>chi2 = 0.0000

.
. * 730-day mortality for comparators by later infection status who are
alive on day 366 & not censored
. tab died_366_730 isfutureinfectedcontrol if infected==0 &
alive_day366==1 & ttstudyend>=366, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

           |   indicator: is the
           |     patienticn an
           | uninfected control in
           |   the 25:1 matched
died_366_7 |       cohort wh
        30 |         0          1 |     Total
-----------+----------------------+----------
         0 |   809,909    121,905 |   931,814
           |     98.39      96.56 |     98.14
-----------+----------------------+----------
         1 |    13,290      4,349 |    17,639
           |      1.61       3.44 |      1.86
-----------+----------------------+----------
     Total |   823,199    126,254 |   949,453
           |    100.00     100.00 |    100.00

. cs died_366_730 isfutureinfectedcontrol if infected==0 &
alive_day366==1 & ttstudyend>=366

                | indicator: is the      |
                | patienticn an          |
```

```
                 | uninfected control in  |
                 | the 25:1 matched       |
                 | cohort wh              |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      4349       13290  |      17639
        Noncases |    121905      809909  |     931814
-----------------+------------------------+-----------
           Total |    126254      823199  |     949453
                 |                        |
            Risk |  .0344464    .0161443  |   .0185781
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |         .0183021       |    .0172599    .0193443
      Risk ratio |         2.133655       |    2.062901    2.206835
 Attr. frac. ex. |         .5313206       |    .5152457    .5468624
 Attr. frac. pop |         .1310002       |
                 +-----------------------------------------------
                              chi2(1) =  2011.05  Pr>chi2 = 0.0000

.
.
. *-----------------------------------------
. * Appendix Figure 2 - Kaplan Meier Curves
. *-----------------------------------------
.
. * 0-90 Days
. preserve

.         stset tte_0_90 , failure(died_0_90==1)

Survival-time data settings

         Failure event: died_0_90==1
Observed time interval: (0, tte_0_90]
     Exit on or before: failure

--------------------------------------------------------------------------
--
  1,245,484  total observations
        341  observations end on or before enter()
--------------------------------------------------------------------------
--
  1,245,143  observations remaining, representing
     23,473  failures in single-record/single-failure data
  110735739  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
90
```

```
.         sts test infected, logrank

        Failure _d: died_0_90==1
  Analysis time _t: tte_0_90

Equality of survivor functions
Log-rank test

         |  Observed       Expected
infected |    events         events
---------+--------------------------
       0 |     11258       19660.53
       1 |     12215        3812.47
---------+--------------------------
   Total |     23473       23473.00

                  chi2(1) = 22116.70
                  Pr>chi2 =   0.0000

.         sts graph, by(infected) name(survival090itt, replace) ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                   size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
0-90", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))  ///
>                 tlabel(, labsize(small)) ylabel(, labsize(small))

        Failure _d: died_0_90==1
  Analysis time _t: tte_0_90

.         *graph save "survival090itt" "Figures\survival090itt.gph",
replace
.         stset , clear

. restore

.
. * 91-180 Days
. preserve

.         keep if alive_day91_casecontrol==1
(74,343 observations deleted)

.         stset tte_91_180 , failure(died_91_180==1)

Survival-time data settings

         Failure event: died_91_180==1
Observed time interval: (0, tte_91_180]
     Exit on or before: failure
```

```
------------------------------------------------------------------------
--
  1,171,141  total observations
     10,502  event time missing (tte_91_180>=.)             PROBABLE
ERROR
------------------------------------------------------------------------
--
  1,160,639  observations remaining, representing
     11,558  failures in single-record/single-failure data
  208398252  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
180

.         sts test infected, logrank

        Failure _d: died_91_180==1
  Analysis time _t: tte_91_180

Equality of survivor functions
Log-rank test

         |  Observed       Expected
infected |    events         events
---------+--------------------------
       0 |      9514        9610.64
       1 |      2044        1947.36
---------+--------------------------
   Total |     11558       11558.00

                  chi2(1) =   5.77
                  Pr>chi2 = 0.0163

.         sts graph, by(infected) name(survival91180itt, replace) ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                   size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
91-180", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))   ///
>                 ylabel(0.9 (0.02) 1.0, labsize(small)) ///
>                 tmin(91) tlabel(90 (20) 190, labsize(small))

        Failure _d: died_91_180==1
  Analysis time _t: tte_91_180

.         *graph save "survival91180itt" "Figures\survival91180itt.gph",
replace
.         stset , clear
```

```
. restore

.
. * 181-365 Days
. preserve

.         keep if alive_day181_casecontrol==1
(86,579 observations deleted)

.         stset tte_181_365 , failure(died_181_365==1)

Survival-time data settings

         Failure event: died_181_365==1
Observed time interval: (0, tte_181_365]
     Exit on or before: failure

--------------------------------------------------------------------------
--
  1,158,905  total observations
     19,710  event time missing (tte_181_365>=.)            PROBABLE
ERROR
--------------------------------------------------------------------------
--
  1,139,195  observations remaining, representing
     24,026  failures in single-record/single-failure data
  412887955  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
365

.         sts test infected, logrank

        Failure _d: died_181_365==1
  Analysis time _t: tte_181_365

Equality of survivor functions
Log-rank test

         |  Observed       Expected
infected |    events         events
---------+-------------------------
       0 |     20594       19936.63
       1 |      3432        4089.37
---------+-------------------------
   Total |     24026       24026.00

                  chi2(1) = 127.36
                  Pr>chi2 = 0.0000
```

```
.         sts graph, by(infected) name(survival181365itt, replace) ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                   size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
181-365", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))   ///
>                 ylabel(0.9 (0.02) 1.0, labsize(small)) ///
>                 tmin(181) tlabel(180 (40) 380, labsize(small))

        Failure _d: died_181_365==1
  Analysis time _t: tte_181_365

.         *graph save "survival181365itt"
"Figures\survival181365itt.gph", replace
.         stset , clear

. restore

.
. * 366-730 Days
. preserve

.         keep if alive_day366_casecontrol==1
(157,981 observations deleted)

.         stset tte_366_730 , failure(died_366_730==1)

Survival-time data settings

         Failure event: died_366_730==1
Observed time interval: (0, tte_366_730]
     Exit on or before: failure

------------------------------------------------------------------------
--
  1,087,503  total observations
     38,020  event time missing (tte_366_730>=.)            PROBABLE
ERROR
------------------------------------------------------------------------
--
  1,049,483  observations remaining, representing
     17,998  failures in single-record/single-failure data
  528362986  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
730

.         sts test infected, logrank
```

```
        Failure _d: died_366_730==1
  Analysis time _t: tte_366_730

Equality of survivor functions
Log-rank test

         |  Observed       Expected
infected |    events         events
---------+--------------------------
       0 |     15481       14871.89
       1 |      2517        3126.11
---------+--------------------------
   Total |     17998       17998.00

                  chi2(1) = 143.65
                  Pr>chi2 = 0.0000

.         sts graph, by(infected) name(survival366730itt, replace)  ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                 size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
366-730", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))   ///
>                 ylabel(0.9 (0.02) 1.0, labsize(small)) ///
>                 tmin(366) tlabel(365 450 550 650 730, labsize(small))

        Failure _d: died_366_730==1
  Analysis time _t: tte_366_730

.         *graph save "survival366730itt"
"Figures\survival366730itt.gph", replace
.         stset , clear

. restore

.
. * 0-365 Days
. preserve

.         stset tte_0_365 , failure(died_0_365)

Survival-time data settings

         Failure event: died_0_365!=0 & died_0_365<.
Observed time interval: (0, tte_0_365]
     Exit on or before: failure

------------------------------------------------------------------------
--
  1,245,484  total observations
```

```
        341  observations end on or before enter()
------------------------------------------------------------------------
--
  1,245,143  observations remaining, representing
     61,899  failures in single-record/single-failure data
  440719447  total analysis time at risk and under observation
                                                 At risk from t =
0
                                      Earliest observed entry t =
0
                                           Last observed exit t =
365

.         *sts test infected, logrank
.         sts graph, by(infected) name(survival0365, replace)

        Failure _d: died_0_365
  Analysis time _t: tte_0_365

.         stset , clear

. restore

.
. * 0-730 Days
. preserve

.         stset tte_0_730 , failure(died_0_730)

Survival-time data settings

         Failure event: died_0_730!=0 & died_0_730<.
Observed time interval: (0, tte_0_730]
     Exit on or before: failure

------------------------------------------------------------------------
--
  1,245,484  total observations
        341  observations end on or before enter()
------------------------------------------------------------------------
--
  1,245,143  observations remaining, representing
     82,056  failures in single-record/single-failure data
  598623178  total analysis time at risk and under observation
                                                 At risk from t =
0
                                      Earliest observed entry t =
0
                                           Last observed exit t =
730

.         stdescribe if infected==1

        Failure _d: died_0_730
```

```
  Analysis time _t: tte_0_730

                                   |-------------- Per subject ---------
-----|
Category                    Total        Mean         Min     Median
Max
-------------------------------------------------------------------------
------
Number of subjects         207861
Number of records          207861           1           1          1
1

Entry time (first)                          0           0          0
0
Exit time (final)                    461.8972           1        471
730

Subjects with gap                 0
Time on gap                       0
Time at risk              96010404    461.8972           1        471
730

Failures                     20209    .0972236           0          0
1
-------------------------------------------------------------------------
------

.         stdescribe if infected==0

        Failure _d: died_0_730
  Analysis time _t: tte_0_730

                                   |-------------- Per subject ---------
-----|
Category                    Total        Mean         Min     Median
Max
-------------------------------------------------------------------------
------
Number of subjects        1037282
Number of records         1037282           1           1          1
1

Entry time (first)                          0           0          0
0
Exit time (final)                    484.5479           1        476
730

Subjects with gap                 0
Time on gap                       0
Time at risk              5.026e+08    484.5479           1        476
730

Failures                     61847    .0596241           0          0
1
```

```
------------------------------------------------------------------------
------

.         *sts test infected, logrank
.         sts graph, by(infected) name(survival0730itt, replace) ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                   size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
0-730", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))   ///
>                 tlabel(, labsize(small)) ylabel(, labsize(small))

        Failure _d: died_0_730
  Analysis time _t: tte_0_730

.         *graph save "survival0730itt" "Figures\survival0730itt.gph",
replace
.         stset , clear

. restore

.
. *------------------------
. * Table 1: SMDs
. *------------------------
.
. * Baseline covariate balance for 5-to-1 match cohort
.
. tab infected

   infected |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  1,037,423       83.29       83.29
          1 |    208,061       16.71      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

.
. stddiff ageatindexdate, by(infected)

------------------------------------------------------------------------
------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+-------------------------+-------------------------+------
------
ageatinde~te |     60.47        16.464 |     60.51         16.19 |   -
0.00286
------------------------------------------------------------------------
------
```

```
. stddiff bmi, by(infected)

------------------------------------------------------------------------------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std Diff
-------------+-------------------------+-------------------------+----------
         bmi |     31.28        6.6078 |     31.34        6.3499 |   -0.01003
------------------------------------------------------------------------------

. stddiff i.sex3cat, by(infected)

------------------------------------------------------------------------------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std Diff
-------------+-------------------------+-------------------------+----------
     sex3cat |                         |                         |
      Female |    109085        (10.5) |     21936        (10.5) |   0.00411
        Male |    914361        (88.1) |    183226        (88.1) |
     Unknown |     13977        ( 1.3) |      2899        ( 1.4) |
------------------------------------------------------------------------------

. stddiff i.race7cat, by(infected)

------------------------------------------------------------------------------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std Diff
-------------+-------------------------+-------------------------+----------
    race7cat |                         |                         |
AmericanIn~e |      9578        ( 0.9) |      1961        ( 0.9) |   0.00338
       Asian |     10536        ( 1.0) |      2081        ( 1.0) |
Black/Afri~r |    237896        (22.9) |     47645        (22.9) |
NativeHawa~d |      9704        ( 0.9) |      1944        ( 0.9) |
       White |    696309        (67.1) |    139604        (67.1) |
MultipleRace |      9869        ( 1.0) |      1975        ( 0.9) |
     Missing |     63531        ( 6.1) |     12851        ( 6.2) |
------------------------------------------------------------------------------

. stddiff i.ethnicity3cat, by(infected)
```

```
------------------------------------------------------------------------------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std Diff
-------------+-------------------------+-------------------------+----------
ethnicity3~t |                         |                         |
    Hispanic |     99093        ( 9.6) |     20280        ( 9.7) |  0.00668
 NotHispanic |    903000        (87.0) |    180675        (86.8) |
     Missing |     35330        ( 3.4) |      7106        ( 3.4) |
------------------------------------------------------------------------------

. stddiff i.rurality2cat, by(infected)

------------------------------------------------------------------------------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std Diff
-------------+-------------------------+-------------------------+----------
rurality2cat |                         |                         |
    NotUrban |    294989        (28.4) |     59064        (28.4) |  0.00104
       Urban |    742434        (71.6) |    148997        (71.6) |
------------------------------------------------------------------------------

. stddiff i.smoking4cat, by(infected)

------------------------------------------------------------------------------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std Diff
-------------+-------------------------+-------------------------+----------
 smoking4cat |                         |                         |
     Current |    131249        (12.7) |     26144        (12.6) |  0.01171
      Former |    439908        (42.4) |     88025        (42.3) |
       Never |    408648        (39.4) |     81777        (39.3) |
     Missing |     57618        ( 5.6) |     12115        ( 5.8) |
------------------------------------------------------------------------------

. stddiff gagne, by(infected)

------------------------------------------------------------------------------
```

```
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+-------------------------+-------------------------+------
------
       gagne |     1.403        2.2383 |     1.441        2.3416 |   -
0.01655
-------------------------------------------------------------------------
------

. stddiff numipadmits, by(infected)

-------------------------------------------------------------------------
------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+-------------------------+-------------------------+------
------
 numipadmits |     .3567        1.2623 |     .3585        1.2094 |   -
0.00152
-------------------------------------------------------------------------
------

. stddiff util_numpcstops, by(infected)

-------------------------------------------------------------------------
------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+-------------------------+-------------------------+------
------
util_numpc~s |     8.278        10.421 |     8.551        9.6582 |   -
0.02719
-------------------------------------------------------------------------
------

. stddiff util_numscstops, by(infected)

-------------------------------------------------------------------------
------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+-------------------------+-------------------------+------
------
util_numsc~s |     13.44         15.34 |     13.88        14.141 |   -
0.02959
-------------------------------------------------------------------------
------

. stddiff util_nummhstops, by(infected)
```

```
------------------------------------------------------------------------
------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+-------------------------+-------------------------+------
------
util_nummh~s |      7.78        21.931 |     7.868        22.644 |   -
0.00392
------------------------------------------------------------------------
------

. stddiff i.immuno, by(infected)

------------------------------------------------------------------------
------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+-------------------------+-------------------------+------
------
      immuno |                         |                         |
           0 |    936167        (90.2) |    187748        (90.2) |
0.00009
           1 |    101256        ( 9.8) |     20313        ( 9.8) |
------------------------------------------------------------------------
------

. stddiff i.clcatindexdate, by(infected)

------------------------------------------------------------------------
------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+-------------------------+-------------------------+------
------
clcatindex~e |                         |                         |
           0 |   1027879        (99.1) |    205899        (99.0) |
0.01210
           1 |      9544        ( 0.9) |      2162        ( 1.0) |
------------------------------------------------------------------------
------

. stddiff i.nosos11cat, by(infected)

------------------------------------------------------------------------
------
             |       infected=0        |       infected=1        |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+-------------------------+-------------------------+------
------
  nosos11cat |                         |                         |
```

```
          1 |     26035        ( 2.5) |      5694        ( 2.7) |
0.03131
          2 |     45530        ( 4.4) |      9582        ( 4.6) |
          3 |     60994        ( 5.9) |     12431        ( 6.0) |
          4 |     75933        ( 7.3) |     15159        ( 7.3) |
          5 |     90104        ( 8.7) |     17707        ( 8.5) |
          6 |    105586        (10.2) |     20526        ( 9.9) |
          7 |    119913        (11.6) |     23431        (11.3) |
          8 |    136532        (13.2) |     26893        (12.9) |
          9 |    157063        (15.1) |     31294        (15.0) |
         10 |    194278        (18.7) |     40555        (19.5) |
         99 |     25455        ( 2.5) |      4789        ( 2.3) |
------------------------------------------------------------------------------
------

. stddiff i.canscore7cat, by(infected)

------------------------------------------------------------------------------
------
             |       infected=0         |       infected=1         |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+--------------------------+--------------------------+------
------
canscore7cat |                          |                          |
          1 |    170471        (16.4) |     34417        (16.5) |
0.02458
          2 |    160008        (15.4) |     31900        (15.3) |
          3 |    194475        (18.7) |     38219        (18.4) |
          4 |    235676        (22.7) |     46759        (22.5) |
          5 |    153135        (14.8) |     30638        (14.7) |
          6 |    102842        ( 9.9) |     22072        (10.6) |
         99 |     20816        ( 2.0) |      4056        ( 1.9) |
------------------------------------------------------------------------------
------

. stddiff neareststa3ndistance, by(infected)

------------------------------------------------------------------------------
------
             |       infected=0         |       infected=1         |
             | Mean or N     SD or (%) | Mean or N     SD or (%) |  Std
Diff
-------------+--------------------------+--------------------------+------
------
nearestst~ce |     35.75        35.103 |     35.59        36.521 |
0.00443
------------------------------------------------------------------------------
------

.
.
. *******
. * ITT *
```

```
. *******
.
. use Data\mortality_varforcox_20230516, clear
(Created in file
'P:\ORD_Ioannou_202104007D\MethodsGroup\Programs\CORC_DataExplor)

.
. *-------------------------------------
. * Table 2: ITT Unadjusted
. *-------------------------------------
.
. * Overall
. preserve

.         sort uniq_patid

.         stset tte_0_730, failure(died_0_730) id(uniq_patid)

Survival-time data settings

           ID variable: uniq_patid
         Failure event: died_0_730!=0 & died_0_730<.
Observed time interval: (tte_0_730[_n-1], tte_0_730]
     Exit on or before: failure

--------------------------------------------------------------------------
--
  1,245,484  total observations
        341  observations end on or before enter()
--------------------------------------------------------------------------
--
  1,245,143  observations remaining, representing
  1,245,143  subjects
     82,056  failures in single-failure-per-subject data
  598623178  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
730

.         stcox infected, efron vce(cluster patienticn)
strata(matchgroupnumber)

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -143313.92
Iteration 1:   log pseudolikelihood = -141294.91
Iteration 2:   log pseudolikelihood =  -141214.1
Iteration 3:   log pseudolikelihood = -141214.06
Refining estimates:
```

```
Iteration 0:   log pseudolikelihood = -141214.06

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects = 1,245,143                         Number of obs =
1,245,143
No. of failures =    82,056
Time at risk    = 598623178
                                                    Wald chi2(1)  =
5361.40
Log pseudolikelihood = -141214.06                   Prob > chi2   =
0.0000

                     (Std. err. adjusted for 1,091,939 clusters in
patienticn)
------------------------------------------------------------------------------
             |               Robust
          _t | Haz. ratio   std. err.      z    P>|z|     [95% conf.
interval]
-------------+----------------------------------------------------------------
    infected |   1.748196   .0133364    73.22   0.000     1.722252
1.774532
------------------------------------------------------------------------------

. restore

.
. * By Period
.
. * stset data
. sort uniq_patid

. recode tte_0_730 (0=0.5)
(341 changes made to tte_0_730)

. stset tte_0_730, failure(died_0_730) id(uniq_patid)

Survival-time data settings

           ID variable: uniq_patid
         Failure event: died_0_730!=0 & died_0_730<.
Observed time interval: (tte_0_730[_n-1], tte_0_730]
     Exit on or before: failure

------------------------------------------------------------------------------
--
  1,245,484  total observations
          0  exclusions
------------------------------------------------------------------------------
--
```

```
  1,245,484  observations remaining, representing
  1,245,484  subjects
     82,397  failures in single-failure-per-subject data
  598623349  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
730

. stsplit period, at(0 90 180 365 730)
(3,562,091 observations (episodes) created)

.
. stdescribe if infected==1

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

                                    |-------------- Per subject ---------
-----|
Category                    Total        Mean         Min     Median
Max
------------------------------------------------------------------------
------
Number of subjects         208061
Number of records          778966    3.743931           1          4
4

Entry time (first)                          0           0          0
0
Exit time (final)                     461.4536          .5        471
730

Subjects with gap                0
Time on gap                      0           .           .          .
.
Time at risk              96010504    461.4536          .5        471
730

Failures                     20409    .0980914           0          0
1
------------------------------------------------------------------------
------

. stdescribe if infected==0

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

                                    |-------------- Per subject ---------
```

```
-----|
Category                    Total        Mean         Min     Median
Max
-------------------------------------------------------------------------
------
Number of subjects        1037423
Number of records         4028609    3.883285           1          4
4

Entry time (first)                          0           0          0
0
Exit time (final)                     484.4821          .5        476
730

Subjects with gap                0
Time on gap                      0           .           .          .
.
Time at risk             5.026e+08    484.4821          .5        476
730

Failures                     61988    .0597519           0          0
1
-------------------------------------------------------------------------
------


. 
. * create new interaction variables after splitting data
. gen timeinfected_0_90 = infected * (tte_0_730<=90)

. gen timeinfected_91_180 = infected * (tte_0_730>90 & tte_0_730<=180)

. gen timeinfected_181_365 = infected * (tte_0_730>180 & tte_0_730<=365)

. gen timeinfected_366_730 = infected * (tte_0_730>365 & tte_0_730<=730)

. 
. * Cox Model
. stcox   timeinfected_0_90 timeinfected_91_180 timeinfected_181_365
///
>                 timeinfected_366_730
///
>                 , efron vce(cluster patienticn)
strata(matchgroupnumber)

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood =  -143924.5
Iteration 1:   log pseudolikelihood = -137775.88
Iteration 2:   log pseudolikelihood = -135674.34
Iteration 3:   log pseudolikelihood = -135605.93
Iteration 4:   log pseudolikelihood = -135605.93
Refining estimates:
```

```
Iteration 0:   log pseudolikelihood = -135605.93

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects =   1,245,484                         Number of obs =
4,807,575
No. of failures =      82,397
Time at risk    = 598623348.5
                                                      Wald chi2(4)  =
23276.74
Log pseudolikelihood = -135605.93                     Prob > chi2   =
0.0000

                            (Std. err. adjusted for 1,092,248 clusters
in patienticn)
------------------------------------------------------------------------------
             |               Robust
          _t | Haz. ratio   std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
   timeinfected_0_90 |   5.752757   .0664537   151.47   0.000     5.623973    5.884489
 timeinfected_91_180 |   1.054258   .0234888     2.37   0.018     1.009212    1.101315
timeinfected_181_365 |   .8058384   .0141301   -12.31   0.000     .7786145    .8340142
timeinfected_366_730 |   .7610328   .0152282   -13.65   0.000     .7317639    .7914724
------------------------------------------------------------------------------

.
. *-----------------------------------------------
. * Subgroup Analyses - Hospitalization, Adj.
. *-----------------------------------------------
.
. * Subgroup analysis for hospitalized/not hospitalized & adjust for
. * imbalanced hospitalization covariates (SMDs>0.1 for hospitalization
subgroups)
.
.
. * Hospitalized Patients
. local imbalanced ageatindexdate bmi i.ethnicity3cat i.smoking4cat ///
>                                  gagne numipadmits util_numpcstops
util_numscstops ///
>                                  i.nosos11cat i.canscore7cat
neareststa3ndistance

.
. stcox   timeinfected_0_90 timeinfected_91_180 timeinfected_181_365
///
```

```
>                 timeinfected_366_730 `imbalanced'  ///
>                 if index_hospitalization==1 ///
>                 , efron vce(cluster patienticn)
strata(matchgroupnumber)

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -1440.6393
Iteration 1:   log pseudolikelihood = -1172.9772
Iteration 2:   log pseudolikelihood = -1161.3109
Iteration 3:   log pseudolikelihood = -1161.1456
Iteration 4:   log pseudolikelihood = -1161.1456
Refining estimates:
Iteration 0:   log pseudolikelihood = -1161.1456

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects =     59,528                              Number of obs =
196,626
No. of failures =     17,336
Time at risk    = 23,463,828
                                                          Wald chi2(32) =
592.53
Log pseudolikelihood = -1161.1456                         Prob > chi2   =
0.0000

                                (Std. err. adjusted for 58,791 clusters
in patienticn)
------------------------------------------------------------------------
--------------
                     |               Robust
                  _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
---------------------+--------------------------------------------------
--------------
   timeinfected_0_90 |   1.766286   .1029108     9.76   0.000
1.575675    1.979956
 timeinfected_91_180 |   .4206626    .048798    -7.46   0.000
.3351138    .5280506
timeinfected_181_365 |   .6015507    .060755    -5.03   0.000
.4935181    .7332319
timeinfected_366_730 |   .4963705   .0635028    -5.47   0.000
.3862852    .6378283
      ageatindexdate |   1.041538    .003405    12.45   0.000
1.034886    1.048233
                 bmi |   .9774227   .0044998    -4.96   0.000
.9686428    .9862821
                     |
       ethnicity3cat |
        NotHispanic  |   .8922326   .1242112    -0.82   0.413
.6791707    1.172134
```

```
            Missing  |    .768472    .183414    -1.10   0.270
.4813586    1.226838
                     |
         smoking4cat |
              Former  |   1.089274   .1145585     0.81   0.416
.8863732    1.338621
               Never  |   1.222564   .1366328     1.80   0.072
.9820691    1.521953
             Missing  |   1.467125   .2287238     2.46   0.014
1.08085     1.991448
                     |
                gagne |   1.105934   .0137585     8.09   0.000
1.079294    1.133232
          numipadmits |   .9977639   .0169808    -0.13   0.895
.9650312    1.031607
     util_numpcstops |   .9978743   .0024727    -0.86   0.390
.9930396    1.002733
     util_numscstops |    .996118   .0020255    -1.91   0.056
.9921559    1.000096
                     |
          nosos11cat |
                   2 |   1.890463   1.139095     1.06   0.291
.580334     6.158263
                   3 |   1.235832   .6985895     0.37   0.708
.4081253    3.742187
                   4 |   .8904004    .523422    -0.20   0.843
.2813238    2.818151
                   5 |   1.623904   .9557067     0.82   0.410
.512398     5.146513
                   6 |   .8261061    .480529    -0.33   0.743
.2641857    2.583225
                   7 |   .7919346   .4583485    -0.40   0.687
.2547058    2.462293
                   8 |   .9265324   .5320575    -0.13   0.894
.3006503    2.855352
                   9 |   .7797282   .4487269    -0.43   0.665
.2523969     2.40881
                  10 |   .7730383   .4460245    -0.45   0.655
.2495044    2.395101
                  99 |   1.460799   .9961124     0.56   0.578
.3838485    5.559312
                     |
         canscore7cat |
                   2 |   1.794562   .6174142     1.70   0.089
.914334     3.522184
                   3 |   2.669336   .8389288     3.12   0.002
1.441732    4.942219
                   4 |   2.444791   .7847459     2.79   0.005
1.303219    4.586341
                   5 |   2.855091   .9563174     3.13   0.002
1.480841     5.50467
                   6 |   3.447004   1.201155     3.55   0.000
1.741122    6.824244
                  99 |   1.896987   .9236675     1.31   0.189
```

```
.7304718    4.926351
                      |
neareststa3ndistance |   1.006099   .0010286     5.95   0.000
1.004085    1.008117
------------------------------------------------------------------------------

.
. * Non-Hospitalized
. stcox   timeinfected_0_90 timeinfected_91_180 timeinfected_181_365
///
>                 timeinfected_366_730 `imbalanced'  ///
>                 if index_hospitalization==0 ///
>                 , efron vce(cluster patienticn)
strata(matchgroupnumber)

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -110382.69
Iteration 1:   log pseudolikelihood = -78084.666
Iteration 2:   log pseudolikelihood = -75957.277
Iteration 3:   log pseudolikelihood = -75826.973
Iteration 4:   log pseudolikelihood = -75825.526
Iteration 5:   log pseudolikelihood = -75825.526
Refining estimates:
Iteration 0:   log pseudolikelihood = -75825.526

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects = 1,185,956                         Number of obs =
4,610,949
No. of failures =    65,061
Time at risk    = 575159521
                                                    Wald chi2(32) =
41033.75
Log pseudolikelihood = -75825.526                   Prob > chi2   =
0.0000

                            (Std. err. adjusted for 1,040,959 clusters
in patienticn)
------------------------------------------------------------------------------
                    |               Robust
                 _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
--------------------+---------------------------------------------------------
   timeinfected_0_90 |   2.685776   .0610014    43.50   0.000
2.568838    2.808038
 timeinfected_91_180 |   .7958783   .0281021    -6.47   0.000
.7426619     .852908
```

```
timeinfected_181_365 |   .6655412   .0183059   -14.80   0.000
.6306121    .7024049
timeinfected_366_730 |   .6678794   .0214694   -12.56   0.000
.6270984    .7113124
      ageatindexdate |    1.06346   .0008091    80.87   0.000
1.061876    1.065047
                 bmi |    .983417   .0011663   -14.10   0.000
.9811337    .9857057
                     |
       ethnicity3cat |
        NotHispanic  |   1.245418   .0294182     9.29   0.000
1.189074    1.304432
            Missing  |   1.318301   .0462191     7.88   0.000
1.230755    1.412073
                     |
         smoking4cat |
             Former  |   .7509477   .0153342   -14.03   0.000
.7214866    .7816118
              Never  |   .6592874   .0140648   -19.53   0.000
.6322893    .6874384
            Missing  |   1.416026   .0524786     9.39   0.000
1.316817     1.52271
                     |
               gagne |   1.146393   .0042877    36.53   0.000
1.13802    1.154828
         numipadmits |   1.020387   .0069369     2.97   0.003
1.006881    1.034074
     util_numpcstops |   1.002465   .0029099     0.85   0.396
.9967781    1.008185
     util_numscstops |   .9907894   .0038424    -2.39   0.017
.9832869    .9983492
                     |
          nosos11cat |
                   2 |   .9459805   .0451239    -1.16   0.244
.8615477    1.038688
                   3 |   .9692975   .0467629    -0.65   0.518
.8818437    1.065424
                   4 |   .8547473   .0429125    -3.13   0.002
.774646    .9431313
                   5 |   .7876494   .0402236    -4.67   0.000
.7126296    .8705667
                   6 |   .7874746   .0410336    -4.59   0.000
.7110207    .8721493
                   7 |   .7431751   .0384667    -5.73   0.000
.6714799    .8225255
                   8 |    .726324     .03568    -6.51   0.000
.6596535    .7997328
                   9 |   .6948543   .0381959    -6.62   0.000
.6238835    .7738985
                  10 |   .8022314   .0464572    -3.81   0.000
.7161543    .8986543
                  99 |   .8713138   .0900282    -1.33   0.182
.7115812    1.066902
                     |
```

```
        canscore7cat |
                   2  |   1.771898   .0653161    15.52   0.000
1.648396    1.904653
                   3  |   2.506954   .0888844    25.92   0.000
2.338659     2.68736
                   4  |   3.557269   .1414773    31.91   0.000
3.290511    3.845653
                   5  |    4.72518   .2235596    32.82   0.000
4.306713    5.184307
                   6  |   5.524527   .2973654    31.75   0.000
4.971392    6.139206
                  99  |   1.808708     .25705     4.17   0.000
1.368981    2.389679
                      |
neareststa3ndistance |   1.003734   .0001643    22.78   0.000
1.003412    1.004056
------------------------------------------------------------------------------
-------------

.
. *----------------------------------
. * Subgroup Analysis - Age, Adj.
. *----------------------------------
.
. local ageimbal   bmi i.ethnicity3cat i.smoking4cat ///
>                                  gagne numipadmits util_numpcstops
util_numscstops ///
>                                  i.nosos11cat i.canscore7cat
neareststa3ndistance

.
. stcox   timeinfected_0_90 timeinfected_91_180 timeinfected_181_365
///
>                 timeinfected_366_730 `ageimbal'  ///
>                 if agecat==1 ///
>                 , efron vce(cluster patienticn)
strata(matchgroupnumber)

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -14558.298
Iteration 1:   log pseudolikelihood = -10426.226
Iteration 2:   log pseudolikelihood = -10288.915
Iteration 3:   log pseudolikelihood = -10285.867
Iteration 4:   log pseudolikelihood = -10285.864
Refining estimates:
Iteration 0:   log pseudolikelihood = -10285.864

Stratified Cox regression with no ties
Strata variable: matchgroupnumber

No. of subjects =     670,258                         Number of obs =
```

```
2,630,678
No. of failures =      12,010
Time at risk    = 331392467.5
                                                  Wald chi2(31) =
6018.82
Log pseudolikelihood = -10285.864                 Prob > chi2   =
0.0000

                              (Std. err. adjusted for 584,782 clusters
in patienticn)
------------------------------------------------------------------------
--------------
                     |               Robust
                  _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
---------------------+--------------------------------------------------
--------------
   timeinfected_0_90 |   5.284862   .2392858    36.77   0.000
4.836078    5.775292
 timeinfected_91_180 |   .8990531   .0605317    -1.58   0.114
.7879079    1.025877
timeinfected_181_365 |    .671949   .0338182    -7.90   0.000
.6088308    .7416108
timeinfected_366_730 |   .7167203   .0439245    -5.43   0.000
.6355993    .8081946
                 bmi |    1.01642   .0020623     8.03   0.000
1.012386     1.02047
                     |
       ethnicity3cat |
        NotHispanic  |   1.042822   .0492994     0.89   0.375
.9505384    1.144065
             Missing |   .9905843   .0794553    -0.12   0.906
.8464788    1.159223
                     |
         smoking4cat |
              Former |   1.264539   .0520099     5.71   0.000
1.166602    1.370698
               Never |   1.106283   .0494139     2.26   0.024
1.013552    1.207498
             Missing |   1.494596   .0891653     6.74   0.000
1.329666    1.679985
                     |
                gagne |   1.281692   .0096121    33.09   0.000
1.26299     1.30067
         numipadmits |   .9424521   .0089856    -6.22   0.000
.9250041    .9602291
     util_numpcstops |    1.00814   .0018797     4.35   0.000
1.004463    1.011831
     util_numscstops |   .9934476   .0014898    -4.38   0.000
.9905319    .9963719
                     |
          nosos11cat |
                   2 |   1.860846    .261989     4.41   0.000
1.412113    2.452174
```

```
                  3  |   2.038102   .2812301     5.16   0.000
1.555148    2.671038
                  4  |   2.339634   .3223176     6.17   0.000
1.786006    3.064877
                  5  |   2.496255    .347292     6.58   0.000
1.900489    3.278782
                  6  |   2.911601   .4024285     7.73   0.000
2.220662    3.817518
                  7  |    3.16451   .4390644     8.30   0.000
2.411045    4.153437
                  8  |   3.142462    .436919     8.24   0.000
2.392883     4.12685
                  9  |   3.320349   .4617294     8.63   0.000
2.528222    4.360661
                 10  |   3.534511   .4953993     9.01   0.000
2.685495    4.651942
                 99  |    4.58878   .7759396     9.01   0.000
3.294301    6.391917
                     |
        canscore7cat |
                  2  |   2.080118   .1240203    12.28   0.000
1.850708    2.337966
                  3  |   3.126317   .1945111    18.32   0.000
2.76741    3.531771
                  4  |   5.145746   .3333184    25.29   0.000
4.532223     5.84232
                  5  |   10.20501   .7459336    31.78   0.000
8.842903    11.77692
                  6  |   17.16867   1.452132    33.61   0.000
14.54594     20.2643
                 99  |   6.622869   1.049954    11.93   0.000
4.854016    9.036311
                     |
neareststa3ndistance |    1.00161   .0004359     3.70   0.000
1.000756    1.002465
------------------------------------------------------------------------------
--------------

.
. stcox   timeinfected_0_90 timeinfected_91_180 timeinfected_181_365
///
>                 timeinfected_366_730 `ageimbal'  ///
>                 if agecat==2 ///
>                 , efron vce(cluster patienticn)
strata(matchgroupnumber)

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -53913.685
Iteration 1:   log pseudolikelihood = -44548.506
Iteration 2:   log pseudolikelihood = -44390.217
Iteration 3:   log pseudolikelihood = -44389.356
```

```
Iteration 4:   log pseudolikelihood = -44389.356
Refining estimates:
Iteration 0:   log pseudolikelihood = -44389.356

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects =     513,602                         Number of obs =
1,962,091
No. of failures =      50,712
Time at risk    = 241928487.5
                                                      Wald chi2(31) =
16103.99
Log pseudolikelihood = -44389.356                     Prob > chi2   =
0.0000

                              (Std. err. adjusted for 453,183 clusters
in patienticn)
------------------------------------------------------------------------
-------------
                     |               Robust
                  _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
---------------------+--------------------------------------------------
-------------
   timeinfected_0_90 |   6.789824   .1469138    88.52   0.000
6.507899    7.083963
 timeinfected_91_180 |   1.100616   .0351329     3.00   0.003
1.033867    1.171675
timeinfected_181_365 |   .7972723   .0213794    -8.45   0.000
.7564515    .8402959
timeinfected_366_730 |    .784958   .0226386    -8.40   0.000
.741818    .8306068
                 bmi |   .9806657   .0012335   -15.52   0.000
.9782511    .9830863
                     |
       ethnicity3cat |
        NotHispanic  |   1.168981   .0334091     5.46   0.000
1.105301    1.236331
             Missing |   1.225305   .0521831     4.77   0.000
1.127181    1.331972
                     |
         smoking4cat |
              Former |   .9551981   .0220499    -1.99   0.047
.9129443    .9994076
               Never |   .8393279   .0205431    -7.16   0.000
.8000146     .880573
             Missing |   1.723717   .0961577     9.76   0.000
1.545189    1.922872
                     |
                gagne |   1.162702   .0046521    37.68   0.000
1.153619    1.171855
         numipadmits |   .9902413   .0072735    -1.34   0.182
.9760877      1.0046
```

```
     util_numpcstops |   1.003995   .0032129     1.25   0.213
.9977178    1.010312
     util_numscstops |   .9929268   .0042029    -1.68   0.094
.9847234    1.001199
                     |
          nosos11cat |
                   2 |   .9713428   .0787541    -0.36   0.720
.8286271    1.138639
                   3 |   1.060664   .0859827     0.73   0.468
.9048472    1.243313
                   4 |   .9181926   .0751208    -1.04   0.297
.7821568    1.077888
                   5 |   .8083899   .0668536    -2.57   0.010
.6874273    .9506376
                   6 |   .7646974   .0634564    -3.23   0.001
.6499124    .8997552
                   7 |   .7171678   .0593465    -4.02   0.000
.6097936    .8434488
                   8 |   .6960344   .0562486    -4.48   0.000
.5940767    .8154904
                   9 |   .6528993   .0552624    -5.04   0.000
.5530942     .770714
                  10 |    .715163   .0624061    -3.84   0.000
.6027373    .8485591
                  99 |   .9311091   .1480032    -0.45   0.653
.6818659    1.271458
                     |
        canscore7cat |
                   2 |   2.000095   .0888593    15.60   0.000
1.833301    2.182064
                   3 |   3.064247   .1343136    25.55   0.000
2.811988    3.339136
                   4 |   4.265834   .2116398    29.24   0.000
3.870557    4.701478
                   5 |   5.710978   .3308729    30.07   0.000
5.097943     6.39773
                   6 |    7.54406   .5008294    30.44   0.000
6.623632    8.592392
                  99 |   3.041893   .5061014     6.69   0.000
2.195449    4.214678
                     |
neareststa3ndistance |    1.00334   .0001943    17.21   0.000
1.002959    1.003721
------------------------------------------------------------------------------
--------------

.
. stcox   timeinfected_0_90 timeinfected_91_180 timeinfected_181_365
///
>                 timeinfected_366_730 `ageimbal'  ///
>                 if agecat==3 ///
>                 , efron vce(cluster patienticn)
strata(matchgroupnumber)
```

```
        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -3847.2796
Iteration 1:   log pseudolikelihood =  -3282.884
Iteration 2:   log pseudolikelihood = -3261.7561
Iteration 3:   log pseudolikelihood =  -3261.483
Iteration 4:   log pseudolikelihood = -3261.4829
Refining estimates:
Iteration 0:   log pseudolikelihood = -3261.4829

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects =     61,624                              Number of obs =
214,806
No. of failures =     19,675
Time at risk    = 25,302,394
                                                          Wald chi2(31) =
1063.16
Log pseudolikelihood = -3261.4829                         Prob > chi2   =
0.0000

                                 (Std. err. adjusted for 55,357 clusters
in patienticn)
------------------------------------------------------------------------
--------------
                     |                 Robust
                  _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
---------------------+--------------------------------------------------
--------------
   timeinfected_0_90 |   6.671193   .5149214    24.59   0.000
5.734596    7.760759
 timeinfected_91_180 |   1.012016   .1035795     0.12   0.907
.8280701    1.236823
timeinfected_181_365 |    .995476   .0778448    -0.06   0.954
.85402    1.160362
timeinfected_366_730 |    .961431   .0914894    -0.41   0.679
.7978443    1.158559
                 bmi |   .9571774   .0037111   -11.29   0.000
.9499313    .9644787
                     |
       ethnicity3cat |
        NotHispanic  |   1.395965   .1376561     3.38   0.001
1.150635    1.693602
            Missing  |   1.489865   .1918538     3.10   0.002
1.157539    1.917602
                     |
         smoking4cat |
             Former  |   .9711018   .1047362    -0.27   0.786
.7860681    1.199691
              Never  |   .9014219   .0993692    -0.94   0.346
```

```
.7262648    1.118822
            Missing  |   1.675092   .2065422     4.18   0.000
1.315479    2.133013
                     |
                gagne |    1.08911   .0097226     9.56   0.000
1.07022     1.108334
          numipadmits |   .9908893   .0140306    -0.65   0.518
.9637679    1.018774
      util_numpcstops |    1.01271   .0024446     5.23   0.000
1.00793     1.017513
      util_numscstops |   .9784877   .0021997    -9.67   0.000
.9741858    .9828086
                     |
           nosos11cat |
                    2  |   .9429193   .0977917    -0.57   0.571
.769476     1.155458
                    3  |   .9031725   .0983665    -0.94   0.350
.7295658     1.11809
                    4  |   .8953397   .1002418    -0.99   0.323
.7189318    1.115034
                    5  |   .8658082   .1022117    -1.22   0.222
.6869646    1.091212
                    6  |   1.096416   .1298875     0.78   0.437
.8692355    1.382972
                    7  |   .9816744   .1175476    -0.15   0.877
.7763239    1.241344
                    8  |   .9285591   .1156599    -0.60   0.552
.72742     1.185315
                    9  |   .9388058    .115931    -0.51   0.609
.7369921    1.195883
                   10  |   1.197808   .1488669     1.45   0.146
.9388527    1.528188
                   99  |   1.116855   .2182779     0.57   0.572
.7614444    1.638157
                     |
         canscore7cat |
                    2  |   .1010701   .0870501    -2.66   0.008
.0186851    .5466999
                    3  |   .2257802    .188703    -1.78   0.075
.0438801    1.161728
                    4  |   .3572221   .2985071    -1.23   0.218
.0694457    1.837518
                    5  |   .4832342   .4045207    -0.87   0.385
.0936715    2.492918
                    6  |   .5566018   .4673908    -0.70   0.485
.1073426    2.886139
                   99  |   .5242315   .4522857    -0.75   0.454
.0966365    2.843841
                     |
neareststa3ndistance |   1.002624   .0006049     4.34   0.000
1.001439     1.00381
------------------------------------------------------------------------------
-------------
```

```
.
.
. *---------------------------------------------
. * Subgroup Analyses - Comorbidities, Adj.
. *---------------------------------------------
.
. * Subgroup analysis by tertile of comorbidity & adjust for
. * covariates
.
. * create tertiles of Gagne scores
. sum gagne, de

                gagne score (min=-2, max=24)
-------------------------------------------------------------
      Percentiles      Smallest
 1%           -1             -2
 5%           -1             -2
10%           -1             -2       Obs           4,807,575
25%            0             -2       Sum of wgt.   4,807,575

50%            1                      Mean           1.352648
                      Largest         Std. dev.      2.190437
75%            2             20
90%            4             20       Variance       4.798016
95%            6             20       Skewness       1.904482
99%            9             22       Kurtosis       7.836349

. histogram gagne
(bin=66, start=-2, width=.36363636)

. xtile gagne_tertile = gagne, nq(3)

. bysort gagne_tertile: sum gagne, de

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-----------------------------------------------
-> gagne_tertile = 1

                gagne score (min=-2, max=24)
-------------------------------------------------------------
      Percentiles      Smallest
 1%           -1             -2
 5%           -1             -2
10%           -1             -2       Obs           2,188,313
25%            0             -2       Sum of wgt.   2,188,313

50%            0                      Mean          -.2387684
                      Largest         Std. dev.      .4293505
75%            0              0
90%            0              0       Variance       .1843419
95%            0              0       Skewness      -1.274364
99%            0              0       Kurtosis       2.772565
```

```
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-----------------------------------------------
-> gagne_tertile = 2

                gagne score (min=-2, max=24)
-------------------------------------------------------------
      Percentiles      Smallest
 1%            1              1
 5%            1              1
10%            1              1       Obs           1,039,996
25%            1              1       Sum of wgt.   1,039,996

50%            1                      Mean                1
                        Largest       Std. dev.           0
75%            1              1
90%            1              1       Variance            0
95%            1              1       Skewness            .
99%            1              1       Kurtosis            .

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-----------------------------------------------
-> gagne_tertile = 3

                gagne score (min=-2, max=24)
-------------------------------------------------------------
      Percentiles      Smallest
 1%            2              2
 5%            2              2
10%            2              2       Obs           1,579,266
25%            2              2       Sum of wgt.   1,579,266

50%            3                      Mean           3.790027
                        Largest       Std. dev.      2.195128
75%            5             20
90%            7             20       Variance       4.818587
95%            8             20       Skewness       1.719706
99%           11             22       Kurtosis       6.502357


.
. * Tertiles of Gagne scores
. local imbalanced ageatindexdate bmi i.ethnicity3cat i.smoking4cat ///
>                                  numipadmits util_numpcstops
util_numscstops ///
>                                  i.nosos11cat i.canscore7cat
neareststa3ndistance

.
. forval i=1/3 {
  2.
.         stcox   timeinfected_0_90 timeinfected_91_180
timeinfected_181_365  ///
```

```
>                         timeinfected_366_730 `imbalanced'  ///
>                         if gagne_tertile==`i'  ///
>                         , efron vce(cluster patienticn)
strata(matchgroupnumber)
  3. }

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -15700.491
Iteration 1:   log pseudolikelihood = -9803.7776
Iteration 2:   log pseudolikelihood = -9309.1306
Iteration 3:   log pseudolikelihood = -9270.3879
Iteration 4:   log pseudolikelihood = -9269.9866
Iteration 5:   log pseudolikelihood = -9269.9865
Refining estimates:
Iteration 0:   log pseudolikelihood = -9269.9865

Stratified Cox regression with no ties
Strata variable: matchgroupnumber

No. of subjects =   558,603                         Number of obs =
2,188,313
No. of failures =    12,952
Time at risk    = 273188034
                                                    Wald chi2(31) =
6841.31
Log pseudolikelihood = -9269.9865                   Prob > chi2   =
0.0000

                              (Std. err. adjusted for 502,965 clusters
in patienticn)
------------------------------------------------------------------------
--------------
                     |                Robust
                  _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
---------------------+--------------------------------------------------
--------------
   timeinfected_0_90 |   7.500308   .3367596    44.88   0.000
6.86848    8.190257
 timeinfected_91_180 |   1.092474   .0832297     1.16   0.246
.940942     1.26841
timeinfected_181_365 |   .6642259   .0379718    -7.16   0.000
.5938205    .7429788
timeinfected_366_730 |   .6921604   .0440451    -5.78   0.000
.6110001    .7841015
      ageatindexdate |    1.07893   .0018691    43.85   0.000
1.075273      1.0826
                 bmi |   .9983562   .0026552    -0.62   0.536
.9931656    1.003574
                     |
       ethnicity3cat |
```

```
        NotHispanic  |   1.280785    .080613     3.93   0.000
1.132143    1.448942
           Missing  |   1.234298   .1081758     2.40   0.016
1.039488    1.465618
                    |
         smoking4cat |
              Former  |   .6624782   .0367862    -7.42   0.000
.5941635    .7386474
               Never  |   .5459423   .0330027   -10.01   0.000
.4849431    .6146144
           Missing  |   1.706001   .0959742     9.49   0.000
1.527894    1.904869
                    |
          numipadmits |   .9505709   .0367023    -1.31   0.189
.8812901    1.025298
     util_numpcstops |   .9832362   .0033014    -5.04   0.000
.9767869     .989728
     util_numscstops |   .9968608   .0029489    -1.06   0.288
.9910977    1.002657
                    |
          nosos11cat |
                   2  |   .8761236   .0616149    -1.88   0.060
.7633139    1.005605
                   3  |   .8618274   .0636981    -2.01   0.044
.7456029     .996169
                   4  |   .7932618   .0627446    -2.93   0.003
.679343    .9262837
                   5  |   .7636355   .0625533    -3.29   0.001
.650369    .8966281
                   6  |   .8066059   .0683144    -2.54   0.011
.6832348    .9522539
                   7  |   .7688624   .0683523    -2.96   0.003
.6459165    .9152103
                   8  |   .7526862   .0685552    -3.12   0.002
.6296308    .8997916
                   9  |   .7029997     .06663    -3.72   0.000
.5838196    .8465092
                  10  |   .8173364   .0838966    -1.97   0.049
.6683871    .9994789
                  99  |    .698701   .0981341    -2.55   0.011
.5305645    .9201199
                    |
         canscore7cat |
                   2  |   1.566203   .0695732    10.10   0.000
1.43561    1.708676
                   3  |   2.140287   .1034365    15.75   0.000
1.946861    2.352931
                   4  |   3.256214   .1831993    20.98   0.000
2.916239    3.635824
                   5  |   3.971556   .3151847    17.38   0.000
3.399452    4.639941
                   6  |   4.446388   .6905831     9.61   0.000
3.279476    6.028514
                  99  |   .4094631   .0807369    -4.53   0.000
```

```
.2782128    .6026324
                     |
neareststa3ndistance |   1.003543   .0004132     8.59   0.000
1.002733    1.004353
-------------------------------------------------------------------------------

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -6722.4221
Iteration 1:   log pseudolikelihood =  -4490.065
Iteration 2:   log pseudolikelihood = -4255.7469
Iteration 3:   log pseudolikelihood = -4235.9202
Iteration 4:   log pseudolikelihood = -4235.6764
Iteration 5:   log pseudolikelihood = -4235.6764
Refining estimates:
Iteration 0:   log pseudolikelihood = -4235.6764

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects =   266,962                         Number of obs =
1,039,996
No. of failures =    11,065
Time at risk    = 129794950
                                                    Wald chi2(31) =
2722.68
Log pseudolikelihood = -4235.6764                   Prob > chi2   =
0.0000

                              (Std. err. adjusted for 238,877 clusters
in patienticn)
-------------------------------------------------------------------------------
                     |               Robust
                  _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
---------------------+---------------------------------------------------------
   timeinfected_0_90 |   6.690617   .4389967    28.97   0.000
5.883227     7.60881
 timeinfected_91_180 |   .9872681   .0927747    -0.14   0.892
.8211959    1.186925
timeinfected_181_365 |   .6966577   .0617185    -4.08   0.000
.5856115    .8287609
timeinfected_366_730 |    .648577   .0603411    -4.65   0.000
.5404669    .7783126
      ageatindexdate |   1.071258   .0024072    30.63   0.000
1.06655    1.075986
                 bmi |   .9884357   .0031168    -3.69   0.000
.9823458    .9945634
                     |
```

```
       ethnicity3cat |
        NotHispanic  |   1.475896    .126844     4.53   0.000
1.247097    1.746671
            Missing  |   1.666383   .2088367     4.07   0.000
1.303465    2.130347
                     |
         smoking4cat |
             Former  |   .6098506   .0417252    -7.23   0.000
.5333169    .6973673
              Never  |   .5384721   .0426363    -7.82   0.000
.461068    .6288708
            Missing  |   1.253396   .1405786     2.01   0.044
1.006049    1.561556
                     |
          numipadmits |   .9522055   .0394156    -1.18   0.237
.878003    1.032679
     util_numpcstops |   1.004287   .0078943     0.54   0.586
.9889334     1.01988
     util_numscstops |   .9797727   .0113424    -1.77   0.078
.9577923    1.002258
                     |
          nosos11cat |
                   2 |   1.127268    .173236     0.78   0.436
.8340965    1.523484
                   3 |   .9379436   .1455454    -0.41   0.680
.6919769    1.271341
                   4 |   .6826789   .1067492    -2.44   0.015
.5024765    .9275072
                   5 |   .7095511   .1112083    -2.19   0.029
.5218845    .9647016
                   6 |    .713858   .1126987    -2.14   0.033
.5238781    .9727323
                   7 |    .674498   .1073065    -2.48   0.013
.4938126    .9212958
                   8 |   .6487984    .103657    -2.71   0.007
.474368    .8873689
                   9 |   .6125635   .0991114    -3.03   0.002
.4460962    .8411503
                  10 |   .6310939   .1047568    -2.77   0.006
.455828    .8737496
                  99 |   .6612896   .2011372    -1.36   0.174
.3643268    1.200307
                     |
        canscore7cat |
                   2 |    1.61206   .1678453     4.59   0.000
1.314485    1.977002
                   3 |   2.125999   .2187151     7.33   0.000
1.737779    2.600948
                   4 |    2.90234   .3070768    10.07   0.000
2.358786    3.571151
                   5 |   5.057096   .6054842    13.54   0.000
3.999329    6.394627
                   6 |   6.567526   1.026871    12.04   0.000
4.834054    8.922615
```

```
                 99  |   .7513228   .3286854    -0.65   0.513
.3187474    1.770951
                     |
neareststa3ndistance |   1.003733   .0006102     6.13   0.000
1.002537    1.004929
-------------------------------------------------------------------------
-------------

        Failure _d: died_0_730
  Analysis time _t: tte_0_730
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -61611.495
Iteration 1:   log pseudolikelihood = -48752.581
Iteration 2:   log pseudolikelihood =  -48126.01
Iteration 3:   log pseudolikelihood = -48110.657
Iteration 4:   log pseudolikelihood =  -48110.59
Iteration 5:   log pseudolikelihood =  -48110.59
Refining estimates:
Iteration 0:   log pseudolikelihood =  -48110.59

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects =     419,919                         Number of obs =
1,579,266
No. of failures =      58,380
Time at risk    = 195640364.5
                                                      Wald chi2(31) =
20250.19
Log pseudolikelihood = -48110.59                      Prob > chi2   =
0.0000

                              (Std. err. adjusted for 358,321 clusters
in patienticn)
-------------------------------------------------------------------------
-------------
                     |               Robust
                  _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
---------------------+---------------------------------------------------
-------------
   timeinfected_0_90 |   5.216509   .1041893    82.70   0.000
5.016247    5.424766
 timeinfected_91_180 |    1.11421   .0342786     3.52   0.000
1.049011    1.183462
timeinfected_181_365 |    .896399   .0208447    -4.70   0.000
.8564612    .9381991
timeinfected_366_730 |   .8391086   .0232476    -6.33   0.000
.7947592    .8859329
      ageatindexdate |   1.056754   .0007212    80.88   0.000
1.055342    1.058169
                 bmi |   .9723692   .0009973   -27.32   0.000
.9704164    .9743259
```

```
                     |
       ethnicity3cat |
        NotHispanic  |   1.298186   .0348883     9.71   0.000
1.231576    1.368398
            Missing  |   1.330528   .0561322     6.77   0.000
1.224936    1.445221
                     |
         smoking4cat |
             Former  |   .7561238   .0158406   -13.34   0.000
.7257055    .7878171
              Never  |   .6661088   .0154207   -17.55   0.000
.6365601     .697029
            Missing  |   1.249002   .0438704     6.33   0.000
1.16591    1.338015
                     |
          numipadmits |   1.089049   .0039806    23.34   0.000
1.081275    1.096878
     util_numpcstops |   1.003157   .0005878     5.38   0.000
1.002006     1.00431
     util_numscstops |   .9921074    .000543   -14.48   0.000
.9910437    .9931722
                     |
          nosos11cat |
                   2 |   1.228826   .1708616     1.48   0.138
.9356971    1.613784
                   3 |   1.188955    .147572     1.39   0.163
.9322123    1.516407
                   4 |   1.032778   .1247076     0.27   0.789
.8151257    1.308547
                   5 |    .746758   .0885363    -2.46   0.014
.5919168    .9421046
                   6 |   .7019939   .0821868    -3.02   0.003
.5580561    .8830571
                   7 |   .6491978   .0755549    -3.71   0.000
.5167881     .815533
                   8 |   .6314767   .0732206    -3.96   0.000
.5031058    .7926022
                   9 |   .6028599    .069684    -4.38   0.000
.4806477    .7561465
                  10 |   .7274012   .0839814    -2.76   0.006
.5800953    .9121129
                  99 |   .8319036   .1152345    -1.33   0.184
.6341112    1.091392
                     |
        canscore7cat |
                   2 |   1.704064   .2050474     4.43   0.000
1.346053    2.157296
                   3 |   2.154765   .2443652     6.77   0.000
1.725313    2.691114
                   4 |   2.903397   .3263227     9.48   0.000
2.329362    3.618894
                   5 |   3.927339   .4440077    12.10   0.000
3.146772    4.901528
                   6 |   5.082562   .5824803    14.19   0.000
```

```
4.060054    6.362583
                 99  |   2.764754   .3918539     7.18   0.000
2.09418    3.650051
                     |
neareststa3ndistance |   1.004875   .0002013    24.28   0.000
1.004481     1.00527
------------------------------------------------------------------------------

. 
. 
. 
. ****************************************************************
. * PP1: Per Protocol for IPCWs - Censoring at Crossover Infections *
. ****************************************************************
. 
. *--------------------------------------
. * Prepping Data for IPCWs and Table 1
. *--------------------------------------
. 
. use Data\mortality_varforcox_20230516, clear
(Created in file
'P:\ORD_Ioannou_202104007D\MethodsGroup\Programs\CORC_DataExplor)

. 
. * create ttinfection variable
. gen ttinfection = futureinfectedcontrolindexdate - index_dt_case
(1,108,158 missing values generated)

. sum ttinfection

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |    137,326    338.8583    179.3397          0        867

. count if ttinfection==0
  6

. 
. *-----------------------------------------------------------------
----------
. * identify those who die during each period; those who die after
infection
. * crossover are coded as not dead at the time of crossover
. *-----------------------------------------------------------------
----------
. 
. * Died Index Day-Day 90;
. gen died_0_90_crossover = .
(1,245,484 missing values generated)

. replace died_0_90_crossover = 1 if inrange(indextodeath_caseindex, 0,
90)
(23,814 real changes made)
```

```
. replace died_0_90_crossover = 0 if indextodeath_caseindex>90
(1,221,670 real changes made)

. replace died_0_90_crossover = 0 if indextodeath_caseindex>ttinfection
(1,157 real changes made)

.
. tab died_0_90 died_0_90_crossover, m

           |  died_0_90_crossover
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,221,670          0 | 1,221,670
         1 |     1,157     22,657 |    23,814
-----------+----------------------+----------
     Total | 1,222,827     22,657 | 1,245,484

. tab died_0_90_crossover case, m

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
           | covid-19 test result
died_0_90_ |          for
 crossover |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,027,181    195,646 | 1,222,827
         1 |    10,242     12,415 |    22,657
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. * Died Day 91-180;
. gen died_91_180_crossover = .
(1,245,484 missing values generated)

. replace died_91_180_crossover = 1 if inrange(indextodeath_caseindex,
91, 180)
(12,359 real changes made)

. replace died_91_180_crossover = 0 if indextodeath_caseindex>180
(1,209,311 real changes made)

. replace died_91_180_crossover = 0 if
indextodeath_caseindex>ttinfection
(2,424 real changes made)

. replace died_91_180_crossover = 0 if
(indextodeath_caseindex>ttstudyend) & (inrange(indextodeath_caseindex,
91, 180)) ///
>
& (inrange(ttstudyend, 91, 180))
(0 real changes made)
```

```
. tab died_91_180 died_91_180_crossover, m //missing represents those
who were censored in period 1

died_91_18 |      died_91_180_crossover
         0 |         0          1          . |     Total
-----------+---------------------------------+----------
         0 | 1,209,311          0          0 | 1,209,311
         1 |     1,267     11,092          0 |    12,359
         . |     1,157          0     22,657 |    23,814
-----------+---------------------------------+----------
     Total | 1,211,735     11,092     22,657 | 1,245,484

. tab died_91_180_crossover case, m

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
died_91_18 | covid-19 test result
0_crossove |          for
         r |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,018,133    193,602 | 1,211,735
         1 |     9,048      2,044 |    11,092
         . |    10,242     12,415 |    22,657
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484


.
. * Died Day 181-365;
. gen died_181_365_crossover = .
(1,245,484 missing values generated)

. replace died_181_365_crossover = 1 if inrange(indextodeath_caseindex,
181, 365)
(26,130 real changes made)

. replace died_181_365_crossover = 0 if indextodeath_caseindex>365
(1,183,181 real changes made)

. replace died_181_365_crossover = 0 if
indextodeath_caseindex>ttinfection
(6,211 real changes made)

. replace died_181_365_crossover = 0 if
(indextodeath_caseindex>ttstudyend) & (inrange(indextodeath_caseindex,
181, 365)) ///
>
& (inrange(ttstudyend, 181, 365))
(59 real changes made)

.
. tab died_181_365 died_181_365_crossover, m //missing represents those
who were censored in period 1&2
```

```
died_181_3 |      died_181_365_crossover
        65 |         0          1          . |     Total
-----------+---------------------------------+----------
         0 | 1,183,244          0          0 | 1,183,244
         1 |     3,783     22,284          0 |    26,067
         . |     2,424          0     33,749 |    36,173
-----------+---------------------------------+----------
     Total | 1,189,451     22,284     33,749 | 1,245,484

. tab died_181_365_crossover case, m

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
died_181_3 | covid-19 test result
65_crossov |          for
        er |         0          1 |     Total
-----------+----------------------+----------
         0 |   999,281    190,170 | 1,189,451
         1 |    18,852      3,432 |    22,284
         . |    19,290     14,459 |    33,749
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. * Died Day 366-730;
. gen died_366_730_crossover = .
(1,245,484 missing values generated)

. replace died_366_730_crossover = 1 if inrange(indextodeath_caseindex,
366, 730)
(32,904 real changes made)

. replace died_366_730_crossover = 0 if indextodeath_caseindex>730
(1,150,277 real changes made)

. replace died_366_730_crossover = 0 if
indextodeath_caseindex>ttinfection
(12,311 real changes made)

. replace died_366_730_crossover = 0 if
(indextodeath_caseindex>ttstudyend) & (inrange(indextodeath_caseindex,
366, 730)) ///
>
& (inrange(ttstudyend, 366, 730))
(10,385 real changes made)

.
. tab died_366_730 died_366_730_crossover, m //missing represents those
who were censored in period 1-3

died_366_7 |      died_366_730_crossover
        30 |         0          1          . |     Total
```

```
----------+-----------------------------------+----------
        0 | 1,162,593          0          0 | 1,162,593
        1 |     4,169     16,419          0 |    20,588
        . |     6,211          0     56,092 |    62,303
----------+-----------------------------------+----------
    Total | 1,172,973     16,419     56,092 | 1,245,484

. tab died_366_730_crossover case, m

          |     indicator: is
          |  `index_dt` the date
          | of the first positive
died_366_7 | covid-19 test result
30_crossov |          for
      er |         0          1 |     Total
----------+----------------------+----------
        0 |   985,394    187,579 | 1,172,973
        1 |    13,837      2,582 |    16,419
        . |    38,192     17,900 |    56,092
----------+----------------------+----------
    Total | 1,037,423    208,061 | 1,245,484

.
. tab died_366_730 died_366_730_crossover if case==1

          | died_366_730_crossove
died_366_7 |           r
       30 |         0          1 |     Total
----------+----------------------+----------
        0 |   187,579          0 |   187,579
        1 |         0      2,582 |     2,582
----------+----------------------+----------
    Total |   187,579      2,582 |   190,161

. tab died_366_730 died_366_730_crossover if case==0

          | died_366_730_crossove
died_366_7 |           r
       30 |         0          1 |     Total
----------+----------------------+----------
        0 |   975,014          0 |   975,014
        1 |     4,169     13,837 |    18,006
----------+----------------------+----------
    Total |   979,183     13,837 |   993,020

.
. *-----------------------------------------------------------------
----------
. * for each period, identify whether patient is alive on the first day
of the
. * period AND was not an infection crossover in the prior period(s)
. *-----------------------------------------------------------------
----------
.
```

```
. * Alive on day 91 & no crossover in prior period
. gen alive_day91_crossover = .
(1,245,484 missing values generated)

. replace alive_day91_crossover = 1 if indextodeath_caseindex>=91
(1,221,670 real changes made)

. replace alive_day91_crossover = 0 if inrange(indextodeath_caseindex,
0, 90)
(23,814 real changes made)

. replace alive_day91_crossover = 0 if inrange(ttinfection, 0, 90)
(15,756 real changes made)

. replace alive_day91_crossover = 0 if ttstudyend<91
(0 real changes made)

.
. sum ttinfection if inrange(ttinfection, 0, 90)

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |     17,044    46.16592    22.62754          0         90

. tab alive_day91 alive_day91_crossover, m

alive_day9 | alive_day91_crossover
         1 |         0          1 |     Total
-----------+----------------------+----------
         0 |    23,814          0 |    23,814
         1 |    15,756  1,205,914 | 1,221,670
-----------+----------------------+----------
     Total |    39,570  1,205,914 | 1,245,484

. tab alive_day91_crossover died_91_180_crossover

alive_day9 |
1_crossove | died_91_180_crossover
         r |         0          1 |     Total
-----------+----------------------+----------
         0 |    16,913          0 |    16,913
         1 | 1,194,822     11,092 | 1,205,914
-----------+----------------------+----------
     Total | 1,211,735     11,092 | 1,222,827

. tab alive_day91 alive_day91_crossover if case==1

alive_day9 | alive_day91_crossover
         1 |         0          1 |     Total
-----------+----------------------+----------
         0 |    12,415          0 |    12,415
         1 |         0    195,646 |   195,646
-----------+----------------------+----------
     Total |    12,415    195,646 |   208,061
```

```
. tab alive_day91 alive_day91_crossover if case==0

alive_day9 | alive_day91_crossover
         1 |         0          1 |     Total
-----------+----------------------+----------
         0 |    11,399          0 |    11,399
         1 |    15,756  1,010,268 | 1,026,024
-----------+----------------------+----------
     Total |    27,155  1,010,268 | 1,037,423

. tab alive_day91_crossover died_0_90_crossover, m

alive_day9 |
1_crossove |  died_0_90_crossover
         r |         0          1 |     Total
-----------+----------------------+----------
         0 |    16,913     22,657 |    39,570
         1 | 1,205,914          0 | 1,205,914
-----------+----------------------+----------
     Total | 1,222,827     22,657 | 1,245,484

. sum ttinfection if ttinfection<91 //17044 crossover infections prior
to day 91

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |     17,044    46.16592    22.62754          0         90

.
. * Alive on day 181 & no crossover in prior periods
. gen alive_day181_crossover = .
(1,245,484 missing values generated)

. replace alive_day181_crossover = 1 if indextodeath_caseindex>=181
(1,209,311 real changes made)

. replace alive_day181_crossover = 0 if inrange(indextodeath_caseindex,
0, 180)
(36,173 real changes made)

. replace alive_day181_crossover = 0 if inrange(ttinfection, 0, 180)
(27,222 real changes made)

. replace alive_day181_crossover = 0 if ttstudyend<181
(0 real changes made)

.
. sum ttinfection if inrange(ttinfection, 0, 180)

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |     29,870    84.65018    50.53237          0        180
```

```
. tab alive_day181 alive_day181_crossover, m

           | alive_day181_crossove
alive_day1 |           r
        81 |         0          1 |     Total
-----------+----------------------+----------
         0 |    36,173          0 |    36,173
         1 |    27,222  1,182,089 | 1,209,311
-----------+----------------------+----------
     Total |    63,395  1,182,089 | 1,245,484

. tab alive_day181 alive_day181_crossover if case==1

           | alive_day181_crossove
alive_day1 |           r
        81 |         0          1 |     Total
-----------+----------------------+----------
         0 |    14,459          0 |    14,459
         1 |         0    193,602 |   193,602
-----------+----------------------+----------
     Total |    14,459    193,602 |   208,061

. tab alive_day181 alive_day181_crossover if case==0

           | alive_day181_crossove
alive_day1 |           r
        81 |         0          1 |     Total
-----------+----------------------+----------
         0 |    21,714          0 |    21,714
         1 |    27,222    988,487 | 1,015,709
-----------+----------------------+----------
     Total |    48,936    988,487 | 1,037,423

. tab alive_day181_crossover died_91_180_crossover

alive_day1 |
81_crossov | died_91_180_crossover
       er |         0          1 |     Total
----------+----------------------+----------
         0 |    29,646     11,092 |    40,738
         1 | 1,182,089          0 | 1,182,089
----------+----------------------+----------
     Total | 1,211,735     11,092 | 1,222,827

. sum ttinfection if ttinfection<181 //29,870 crossover infections prior
to day 181

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |     29,870    84.65018    50.53237           0        180

. tab died_181_365_crossover case if alive_day181_crossover

           |     indicator: is
```

```
           |  `index_dt` the date
           | of the first positive
died_181_3 | covid-19 test result
65_crossov |          for
        er |         0          1 |     Total
-----------+----------------------+----------
         0 |   969,635    190,170 | 1,159,805
         1 |    18,852      3,432 |    22,284
-----------+----------------------+----------
     Total |   988,487    193,602 | 1,182,089

.
. * Alive on day 366 & no crossover in prior periods
. gen alive_day366_crossover = .
(1,245,484 missing values generated)

. replace alive_day366_crossover = 1 if indextodeath_caseindex>=366
(1,183,181 real changes made)

. replace alive_day366_crossover = 0 if inrange(indextodeath_caseindex,
0, 365)
(62,303 real changes made)

. replace alive_day366_crossover = 0 if inrange(ttinfection, 0, 365)
(65,576 real changes made)

. replace alive_day366_crossover = 0 if ttstudyend<366
(48,497 real changes made)

.
. sum ttinfection if inrange(ttinfection, 0, 365)

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |     72,253    201.5884    111.1569          0        365

. tab alive_day366 alive_day366_crossover

           | alive_day366_crossove
alive_day3 |           r
        66 |         0          1 |     Total
-----------+----------------------+----------
         0 |   114,374          0 |   114,374
         1 |    62,002  1,069,108 | 1,131,110
-----------+----------------------+----------
     Total |   176,376  1,069,108 | 1,245,484

. tab alive_day366 alive_day366_crossover if case==1

           | alive_day366_crossove
alive_day3 |           r
        66 |         0          1 |     Total
-----------+----------------------+----------
         0 |    26,404          0 |    26,404
```

```
         1 |         0    181,657 |   181,657
-----------+----------------------+----------
     Total |    26,404    181,657 |   208,061

. tab alive_day366 alive_day366_crossover if case==0

           | alive_day366_crossove
alive_day3 |           r
        66 |         0          1 |     Total
-----------+----------------------+----------
         0 |    87,970          0 |    87,970
         1 |    62,002    887,451 |   949,453
-----------+----------------------+----------
     Total |   149,972    887,451 | 1,037,423

. tab alive_day366_crossover died_181_365_crossover

alive_day3 | died_181_365_crossove
66_crossov |           r
       er |         0          1 |     Total
-----------+----------------------+----------
         0 |   120,343     22,284 |   142,627
         1 | 1,069,108          0 | 1,069,108
-----------+----------------------+----------
     Total | 1,189,451     22,284 | 1,211,735

. sum ttinfection if ttinfection<366  //72253 crossover infections prior
to day 181

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |     72,253    201.5884    111.1569          0        365

. tab died_366_730_crossover case if alive_day366_crossover

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
died_366_7 | covid-19 test result
30_crossov |          for
       er |         0          1 |     Total
-----------+----------------------+----------
         0 |   873,923    179,139 | 1,053,062
         1 |    13,528      2,518 |    16,046
-----------+----------------------+----------
     Total |   887,451    181,657 | 1,069,108

.
. * check mortality by period prior to applying below criteria
. tab died_0_90_crossover case, co

+--------------------+
| Key                |
|--------------------|
```

```
|     frequency     |
| column percentage |
+-------------------+

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
           | covid-19 test result
died_0_90_ |          for
 crossover |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,027,181    195,646 | 1,222,827
           |     99.01      94.03 |     98.18
-----------+----------------------+----------
         1 |    10,242     12,415 |    22,657
           |      0.99       5.97 |      1.82
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
           |    100.00     100.00 |    100.00

. tab died_91_180_crossover case, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
died_91_18 | covid-19 test result
0_crossove |          for
         r |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,018,133    193,602 | 1,211,735
           |     99.12      98.96 |     99.09
-----------+----------------------+----------
         1 |     9,048      2,044 |    11,092
           |      0.88       1.04 |      0.91
-----------+----------------------+----------
     Total | 1,027,181    195,646 | 1,222,827
           |    100.00     100.00 |    100.00

. tab died_181_365_crossover case, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+
```

```
           |     indicator: is
           |  `index_dt` the date
           | of the first positive
died_181_3 | covid-19 test result
65_crossov |          for
       er |         0          1 |     Total
----------+----------------------+----------
         0 |   999,281    190,170 | 1,189,451
           |     98.15      98.23 |     98.16
----------+----------------------+----------
         1 |    18,852      3,432 |    22,284
           |      1.85       1.77 |      1.84
----------+----------------------+----------
     Total | 1,018,133    193,602 | 1,211,735
           |    100.00     100.00 |    100.00

. tab died_366_730_crossover case, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
died_366_7 | covid-19 test result
30_crossov |          for
       er |         0          1 |     Total
----------+----------------------+----------
         0 |   985,394    187,579 | 1,172,973
           |     98.62      98.64 |     98.62
----------+----------------------+----------
         1 |    13,837      2,582 |    16,419
           |      1.38       1.36 |      1.38
----------+----------------------+----------
     Total |   999,231    190,161 | 1,189,392
           |    100.00     100.00 |    100.00


. 
. *-------------------------------------------------------------------
----------
. * for each period, identify whether the case and at least one
comparator
. * in a matched group are alive on the first day of the period & were
not
. * an infection crossover in the prior period
. *-------------------------------------------------------------------
----------
. 
. * drop previous versions of variable
. 
```

```
. foreach i of numlist 91 181 366 {
  2.         drop alive_day`i'_casecontrol
  3. }

.
. foreach i of numlist 91 181 366 {
  2.
.         //cases
.         gen alive_day`i'_case = 0
  3.         replace alive_day`i'_case = 1 if case==1 &
alive_day`i'_crossover==1
  4.         replace alive_day`i'_case = 0 if case==1 & ttstudyend<`i'
  5.         tab alive_day`i'_case alive_day`i'_crossover if case==1
  6.         sum indextodeath if indextodeath<`i' & case==1
  7.
.         bysort matchgroupnumber: egen alive_day`i'_case_grp =
max(alive_day`i'_case)
  8.
.         //comparators
.         gen alive_day`i'_control = 0
  9.         replace alive_day`i'_control = 1 if case==0 &
alive_day`i'_crossover==1
 10.         replace alive_day`i'_control = 0 if case==0 &
ttstudyend<`i'
 11.
.         tab alive_day`i'_control alive_day`i'_crossover if case==0
 12.         sum indextodeath if indextodeath<`i' & case==0
 13.
.         bysort matchgroupnumber: egen alive_day`i'_control_num =
sum(alive_day`i'_control)
 14.
.         //case and at least one comparator alive on day`i'
.         gen alive_day`i'_crosscasecontrol = 0
 15.         replace alive_day`i'_crosscasecontrol = 1 if
alive_day`i'_case_grp==1 & alive_day`i'_control_num>=1
 16.
.         tab alive_day`i'_crosscasecontrol case
 17. }
(195,646 real changes made)
(0 real changes made)

alive_day9 | alive_day91_crossover
    1_case |         0          1 |     Total
-----------+----------------------+----------
         0 |    12,415          0 |    12,415
         1 |         0    195,646 |   195,646
-----------+----------------------+----------
     Total |    12,415    195,646 |   208,061

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     12,415    22.35747    19.79229          0         90
(1,010,268 real changes made)
(0 real changes made)
```

```
alive_day9 | alive_day91_crossover
 1_control |         0          1 |     Total
-----------+----------------------+----------
         0 |    27,155          0 |    27,155
         1 |         0  1,010,268 | 1,010,268
-----------+----------------------+----------
     Total |    27,155  1,010,268 | 1,037,423

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     11,399      44.554    25.89809          0         90
(1,171,103 real changes made)

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
alive_day9 | covid-19 test result
1_crosscas |          for
  econtrol |         0          1 |     Total
-----------+----------------------+----------
         0 |    61,943     12,438 |    74,381
         1 |   975,480    195,623 | 1,171,103
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
(193,602 real changes made)
(0 real changes made)

           | alive_day181_crossove
alive_day1 |           r
   81_case |         0          1 |     Total
-----------+----------------------+----------
         0 |    14,459          0 |    14,459
         1 |         0    193,602 |   193,602
-----------+----------------------+----------
     Total |    14,459    193,602 |   208,061

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     14,459    38.05222    43.91964          0        180
(988,487 real changes made)
(0 real changes made)

           | alive_day181_crossove
alive_day1 |           r
81_control |         0          1 |     Total
-----------+----------------------+----------
         0 |    48,936          0 |    48,936
         1 |         0    988,487 |   988,487
-----------+----------------------+----------
     Total |    48,936    988,487 | 1,037,423

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
```

```
indextodea~x |     21,714    87.84411    52.42273          0        180
(1,158,838 real changes made)

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
alive_day1 | covid-19 test result
81_crossca |          for
 secontrol |         0          1 |     Total
-----------+----------------------+----------
         0 |    72,147     14,499 |    86,646
         1 |   965,276    193,562 | 1,158,838
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
(181,657 real changes made)
(0 real changes made)

           | alive_day366_crossove
alive_day3 |           r
   66_case |         0          1 |     Total
-----------+----------------------+----------
         0 |    26,404          0 |    26,404
         1 |         0    181,657 |   181,657
-----------+----------------------+----------
     Total |    26,404    181,657 |   208,061

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     17,900    83.07486    103.0125          0        365
(887,451 real changes made)
(0 real changes made)

           | alive_day366_crossove
alive_day3 |           r
66_control |         0          1 |     Total
-----------+----------------------+----------
         0 |   149,972          0 |   149,972
         1 |         0    887,451 |   887,451
-----------+----------------------+----------
     Total |   149,972    887,451 | 1,037,423

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     44,403       182.9    106.9272          0        365
(1,087,393 real changes made)

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
alive_day3 | covid-19 test result
66_crossca |          for
 secontrol |         0          1 |     Total
-----------+----------------------+----------
         0 |   131,633     26,458 |   158,091
```

```
         1 |   905,790    181,603 | 1,087,393
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484

.
. * drop variables we no longer need
.
. foreach i of numlist 91 181 366 {
  2.         drop alive_day`i'_case alive_day`i'_case_grp
alive_day`i'_control alive_day`i'_control_num
  3. }

.
. *-----------------------------------------------
. * Create categories for PP1 subgroup analyses
. *-----------------------------------------------
.
. * Note: all categories are in relation to the original infected case *
.
. ** age categories **
.
. * <65
. sum ageatindexdate

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
ageatinde~te |  1,245,484    60.47358    16.41887   18.88493   99.99726

.
. gen mkg_age_less65_case = 0

. replace mkg_age_less65=1 if case==1 & ageatindexdate<65
(115,041 real changes made)

.
. bysort matchgroupnumber (patienticn): egen age_less65_case =
max(mkg_age_less65_case)

. tab age_less65_case

age_less65_ |
       case |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |    557,143       44.73       44.73
          1 |    688,341       55.27      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

.
. drop mkg_age_less65_case

.
. * 65-85
. gen mkg_age_65to85_case = 0
```

```
. replace mkg_age_65to85_case=1 if case==1 & inrange(ageatindexdate, 65,
85)
(82,301 real changes made)

.
. bysort matchgroupnumber (patienticn): egen age_65to85_case =
max(mkg_age_65to85_case)

. tab age_65to85_case

age_65to85_ |
       case |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |    752,514       60.42       60.42
          1 |    492,970       39.58      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

.
. drop mkg_age_65to85_case

.
. * >85
. gen mkg_age_more85_case = 0

. replace mkg_age_more85_case=1 if case==1 & ageatindexdate>85
(10,719 real changes made)

.
. bysort matchgroupnumber (patienticn): egen age_more85_case =
max(mkg_age_more85_case)

. tab age_more85_case

age_more85_ |
       case |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  1,181,311       94.85       94.85
          1 |     64,173        5.15      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

.
. drop mkg_age_more85_case

.
.
. ** Tertiles of Gagne scores **
. sum gagne if case==1, de

                gagne score (min=-2, max=24)
-------------------------------------------------------------
      Percentiles      Smallest
```

```
 1%           -1             -2
 5%           -1             -2
10%           -1             -2       Obs             208,061
25%            0             -2       Sum of wgt.     208,061

50%            1                      Mean           1.440803
                      Largest          Std. dev.      2.341555
75%            2             19
90%            4             20       Variance       5.482881
95%            6             20       Skewness       1.971733
99%           10             20       Kurtosis       8.011107

. xtile mkg_gagne_tertile = gagne if case==1, nq(3)

.
. bysort mkg_gagne_tertile: sum gagne

--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-----------------------------------------------
-> mkg_gagne_tertile = 1

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
       gagne |     93,002   -.2447689    .4331417        -2          0

--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-----------------------------------------------
-> mkg_gagne_tertile = 2

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
       gagne |     70,162    1.358656    .4796093         1          2

--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-----------------------------------------------
-> mkg_gagne_tertile = 3

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
       gagne |     44,897    5.060761    2.379211         3         20

--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-----------------------------------------------
-> mkg_gagne_tertile = .

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
       gagne |  1,037,423    1.402901    2.238274        -2         22
```

```
.
. bysort matchgroupnumber (patienticn): egen gagne_tertile_case =
max(mkg_gagne_tertile)

. sum gagne_tertile_case

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
gagne_tert~e |  1,245,484    1.769205    .7805706          1          3

.
. ** Probabilities of death in first 90 days **
.
. * fit logistic regression model for comparator deaths during first 90
days
. local covar ageatindexdate bmi i.sex3cat i.race7cat i.ethnicity3cat
///
>                         i.rurality2cat i.smoking4cat gagne numipadmits
util_numpcstops ///
>                         util_numscstops util_nummhstops i.immuno
i.clcatindexdate ///
>                         i.nosos11cat i.canscore7cat
neareststa3ndistance

.
. logit died_0_90 `covar' if case==0

Iteration 0:   log likelihood = -62756.685
Iteration 1:   log likelihood = -55368.077
Iteration 2:   log likelihood =  -52670.45
Iteration 3:   log likelihood = -52494.908
Iteration 4:   log likelihood = -52491.217
Iteration 5:   log likelihood = -52491.201
Iteration 6:   log likelihood = -52491.201

Logistic regression                                     Number of obs =
1,037,423
                                                        LR chi2(40)   =
20530.97
                                                        Prob > chi2   =
0.0000
Log likelihood = -52491.201                             Pseudo R2     =
0.1636

------------------------------------------------------------------------
-----------------------
                  died_0_90 | Coefficient  Std. err.      z    P>|z|
[95% conf. interval]
----------------------------+-------------------------------------------
-----------------------
            ageatindexdate |   .0501644   .0010291    48.75   0.000
.0481474    .0521813
                       bmi |  -.0216606   .0016231   -13.35   0.000
-.0248418   -.0184793
```

```
                                |
                     sex3cat |
                       Male  |   .4578403   .0621326     7.37   0.000
.3360626     .579618
                     Unknown  |   .7157964   .1086869     6.59   0.000
.502774    .9288188
                                |
                     race7cat |
                       Asian  |  -.3956703   .1705535    -2.32   0.020
-.729949   -.0613915
           Black/AfricanAmer  |  -.3923309   .0998636    -3.93   0.000
-.58806   -.1966019
NativeHawaiian/PacificIsland  |  -.1711533   .1416686    -1.21   0.227
-.4488187     .106512
                      White  |  -.2352478   .0975313    -2.41   0.016
-.4264057   -.0440899
                 MultipleRace  |  -.3396909   .1526475    -2.23   0.026
-.6388744   -.0405073
                     Missing  |  -.2915382   .1102476    -2.64   0.008
-.5076195    -.075457
                                |
                ethnicity3cat |
                  NotHispanic  |   .0024398   .0417852     0.06   0.953
-.0794577    .0843372
                     Missing  |   .0287298   .0693445     0.41   0.679
-.107183    .1646426
                                |
                 rurality2cat |
                       Urban  |   -.014362   .0233265    -0.62   0.538
-.0600811    .0313572
                                |
                  smoking4cat |
                      Former  |  -.1434746   .0317828    -4.51   0.000
-.2057677   -.0811814
                       Never  |  -.2075364    .033906    -6.12   0.000
-.273991   -.1410818
                     Missing  |   .3945889   .0502605     7.85   0.000
.2960801    .4930977
                                |
                        gagne |   .1579537   .0040056    39.43   0.000
.1501028    .1658046
                 numipadmits |  -.0024634    .005221    -0.47   0.637
-.0126963    .0077696
               util_numpcstops |    .007242   .0009396     7.71   0.000
.0054003    .0090836
               util_numscstops |  -.0113454   .0008449   -13.43   0.000
-.0130013   -.0096896
               util_nummhstops |  -.0032296   .0005546    -5.82   0.000
-.0043166   -.0021426
                     1.immuno |   .1424113   .0268694     5.30   0.000
.0897482    .1950744
              1.clcatindexdate |   .1860423   .0523672     3.55   0.000
.0834044    .2886801
                                |
```

```
                  nosos11cat |
                           2 |  -.3261046   .1031314    -3.16   0.002
-.5282385   -.1239708
                           3 |  -.0482072   .0932017    -0.52   0.605
-.2308791    .1344648
                           4 |  -.1992918   .0910699    -2.19   0.029
-.3777856   -.0207981
                           5 |  -.3142041   .0894185    -3.51   0.000
-.4894611   -.1389471
                           6 |  -.4216598   .0878902    -4.80   0.000
-.5939213   -.2493982
                           7 |  -.5351033    .086918    -6.16   0.000
-.7054595   -.3647472
                           8 |  -.5075741   .0854003    -5.94   0.000
-.6749556   -.3401927
                           9 |  -.5565842   .0848727    -6.56   0.000
-.7229317   -.3902367
                          10 |  -.3988552   .0850978    -4.69   0.000
-.5656438   -.2320665
                          99 |  -.0005753   .1173074    -0.00   0.996
-.2304936    .2293431
                             |
                canscore7cat |
                           2 |   .7516619   .0970557     7.74   0.000
.5614362    .9418876
                           3 |   1.249969   .0908691    13.76   0.000
1.071869    1.428069
                           4 |     1.6701   .0897059    18.62   0.000
1.49428    1.845921
                           5 |   2.056566   .0920936    22.33   0.000
1.876066    2.237067
                           6 |   2.388942   .0956076    24.99   0.000
2.201554    2.576329
                          99 |   1.596729   .1201958    13.28   0.000
1.36115    1.832309
                             |
         neareststa3ndistance |   .0024652   .0002929     8.42   0.000
.0018912    .0030393
                       _cons |   -9.01926   .1820659   -49.54   0.000
-9.376103   -8.662418
------------------------------------------------------------------------
----------------------

. lroc, nograph //0.846

Logistic model for died_0_90

Number of observations =  1037423
Area under ROC curve   =   0.8459

. predict mkg_pr_died0_90
(option pr assumed; Pr(died_0_90))

. gen mkg_pr_died0_90_case = mkg_pr_died0_90 if case==1
```

```
(1,037,423 missing values generated)

.
. bysort matchgroupnumber (patienticn): egen pr_died0_90_case =
max(mkg_pr_died0_90_case)

.
. * create tertiles of predicted probabilities of death in first 90 days
. xtile pr_died0_90_tertile = pr_died0_90_case, nq(3)

. tab pr_died0_90_tertile

3 quantiles |
        of |
pr_died0_90 |
      _case |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |    415,167       33.33       33.33
          2 |    415,160       33.33       66.67
          3 |    415,157       33.33      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

.
. bysort pr_died0_90_tertile: sum pr_died0_90_case

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-------------------------------------------
-> pr_died0_90_tertile = 1

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
pr_died0_~se |    415,167    .0008415    .0004402   .0000576   .0017813

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-------------------------------------------
-> pr_died0_90_tertile = 2

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
pr_died0_~se |    415,160    .0042522    .0018158   .0017814   .0081787

-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
-------------------------------------------
-> pr_died0_90_tertile = 3

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
pr_died0_~se |    415,157    .0306809    .0323484   .0081789   .5654742
```

```
.
.
. ** Probabilities of death in days 181-730 **
.
. * died in days 181-730
. gen died_181_730 = !missing(best_death_date)

. replace died_181_730 = 0 if indextodeath_caseindex<181 |
indextodeath_caseindex>730
(37,561 real changes made)

.
. * fit logistic regression model for comparator deaths during 181-730
days
. local covar ageatindexdate bmi i.sex3cat i.race7cat i.ethnicity3cat
///
>                         i.rurality2cat i.smoking4cat gagne numipadmits
util_numpcstops ///
>                         util_numscstops util_nummhstops i.immuno
i.clcatindexdate ///
>                         i.nosos11cat i.canscore7cat
neareststa3ndistance

.
. logit died_181_730 `covar' if case==0

Iteration 0:   log likelihood = -204114.37
Iteration 1:   log likelihood = -191425.15
Iteration 2:   log likelihood = -166974.46
Iteration 3:   log likelihood = -166176.34
Iteration 4:   log likelihood =  -166166.2
Iteration 5:   log likelihood = -166166.17
Iteration 6:   log likelihood = -166166.17

Logistic regression                                     Number of obs =
1,037,423
                                                        LR chi2(40)   =
75896.39
                                                        Prob > chi2   =
0.0000
Log likelihood = -166166.17                             Pseudo R2     =
0.1859

------------------------------------------------------------------------
-----------------------
                died_181_730 | Coefficient  Std. err.      z    P>|z|
[95% conf. interval]
-----------------------------+------------------------------------------
-----------------------
             ageatindexdate |   .0577912   .0005167   111.84   0.000
.0567784     .058804
                        bmi |  -.0113613   .0007813   -14.54   0.000
-.0128925     -.00983
                            |
```

```
                    sex3cat |
                      Male  |   .4820631   .0289214    16.67   0.000
.4253782     .538748
                    Unknown  |   .6188037   .0536677    11.53   0.000
.513617    .7239904
                            |
                    race7cat |
                      Asian  |  -.5767519   .0905526    -6.37   0.000
-.7542318    -.399272
           Black/AfricanAmer  |  -.3593859   .0514899    -6.98   0.000
-.4603043   -.2584675
NativeHawaiian/PacificIsland  |  -.1970492   .0733454    -2.69   0.007
-.3408036   -.0532948
                      White  |  -.1911021   .0503895    -3.79   0.000
-.2898638   -.0923404
                 MultipleRace  |  -.1773534   .0748844    -2.37   0.018
-.3241243   -.0305826
                    Missing  |  -.1394429   .0562494    -2.48   0.013
-.2496898   -.0291961
                            |
                ethnicity3cat |
                 NotHispanic  |   .1783973   .0216559     8.24   0.000
.1359525    .2208421
                    Missing  |   .1477052   .0350344     4.22   0.000
.079039    .2163714
                            |
                 rurality2cat |
                      Urban  |   .0058641   .0115908     0.51   0.613
-.0168534    .0285816
                            |
                  smoking4cat |
                     Former  |  -.2749115   .0153597   -17.90   0.000
-.305016    -.244807
                      Never  |  -.3506341   .0163387   -21.46   0.000
-.3826574   -.3186108
                    Missing  |   .2174937   .0260512     8.35   0.000
.1664343    .2685531
                            |
                       gagne |   .1285267   .0021927    58.61   0.000
.1242291    .1328244
                  numipadmits |  -.0054117    .002982    -1.81   0.070
-.0112564    .0004329
                util_numpcstops |   .0020919   .0005356     3.91   0.000
.0010422    .0031416
                util_numscstops |  -.0056286   .0004423   -12.72   0.000
-.0064955   -.0047616
                util_nummhstops |  -.0023689   .0002572    -9.21   0.000
-.002873   -.0018648
                    1.immuno |   .0438204   .0142137     3.08   0.002
.0159621    .0716787
                1.clcatindexdate |   .1551883   .0306509     5.06   0.000
.0951136     .215263
                            |
                   nosos11cat |
```

```
                          2  |  -.1550357   .0493244    -3.14   0.002
-.2517097   -.0583618
                          3  |  -.1285367    .046825    -2.75   0.006
-.2203121   -.0367613
                          4  |  -.2072587   .0453812    -4.57   0.000
-.2962042   -.1183132
                          5  |  -.2603685   .0443569    -5.87   0.000
-.3473065   -.1734305
                          6  |   -.273505   .0434103    -6.30   0.000
-.3585877   -.1884224
                          7  |  -.3268706   .0429328    -7.61   0.000
-.4110172   -.2427239
                          8  |  -.3649313   .0425728    -8.57   0.000
-.4483724   -.2814902
                          9  |  -.3671297   .0424201    -8.65   0.000
-.4502715   -.2839878
                         10  |  -.1728259    .042793    -4.04   0.000
-.2566986   -.0889533
                         99  |   .0606899    .059871     1.01   0.311
-.056655    .1780349
                             |
                  canscore7cat |
                          2  |   .6449698   .0398461    16.19   0.000
.5668728    .7230668
                          3  |   1.043083   .0376195    27.73   0.000
.9693501    1.116816
                          4  |   1.404931    .037375    37.59   0.000
1.331678    1.478185
                          5  |    1.73882   .0388632    44.74   0.000
1.662649     1.81499
                          6  |   1.947474    .041145    47.33   0.000
1.866831    2.028117
                         99  |   1.040115   .0581389    17.89   0.000
.9261645    1.154065
                             |
          neareststa3ndistance |   .0020697   .0001474    14.04   0.000
.0017808    .0023586
                       _cons |  -8.124368    .088594   -91.70   0.000
-8.298009   -7.950727
------------------------------------------------------------------------
----------------------

. lroc, nograph //0.830

Logistic model for died_181_730

Number of observations =  1037423
Area under ROC curve   =   0.8302

. predict mkg_pr_died181_730
(option pr assumed; Pr(died_181_730))

. gen mkg_pr_died181_730_case = mkg_pr_died181_730 if case==1
(1,037,423 missing values generated)
```

```
.
. bysort matchgroupnumber (patienticn): egen pr_died181_730_case =
max(mkg_pr_died181_730_case)

.
. * create tertiles of predicted probabilities of death in 181-730 days
. xtile pr_died181_730_tertile = pr_died181_730_case, nq(3)

. tab pr_died181_730_tertile

3 quantiles |
         of |
pr_died181_ |
   730_case |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |    415,164       33.33       33.33
          2 |    415,160       33.33       66.67
          3 |    415,160       33.33      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

.
. bysort pr_died181_730_tertile: sum pr_died181_730_case

--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-----------------------------------------------
-> pr_died181_730_tertile = 1

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
pr_died18~se |    415,164     .004442    .0024142   .0003538     .00979

--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-----------------------------------------------
-> pr_died181_730_tertile = 2

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
pr_died18~se |    415,160    .0237697    .0100769     .00979   .0450446

--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
-----------------------------------------------
-> pr_died181_730_tertile = 3

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
pr_died18~se |    415,160    .1277293    .0909023   .0450463   .8045333


.
```

```
.
. drop mkg_pr*

.
. *-------------------------------------------------------
. * PP1 mortality for COVID+ Veterans and comparators
. *-------------------------------------------------------
.
.         /*
>
>         Criteria
>            1)   Case and at least 1 comparator in the strata must be
alive on the
>                         first day of the period
>
>            2)   Patients who were censored due to an infection
crossover
>                         in the previous period are excluded in the
current period
>
>            3)   Patients who die after the infection crossover are
alive
>                         at the time of the infection crossover
>         */
.
.
.
. * Overall *
.
. * 90-day mortality
. tab died_0_90_crossover infected , co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_0_90_  |       infected
 crossover  |         0          1  |     Total
------------+----------------------+----------
         0  | 1,027,181    195,646  | 1,222,827
            |     99.01      94.03  |     98.18
------------+----------------------+----------
         1  |    10,242     12,415  |    22,657
            |      0.99       5.97  |      1.82
------------+----------------------+----------
     Total  | 1,037,423    208,061  | 1,245,484
            |    100.00     100.00  |    100.00

. cs died_0_90_crossover infected

                  |        infected        |
```

```
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |     12415       10242  |      22657
        Noncases |    195646     1027181  |    1222827
-----------------+------------------------+-----------
           Total |    208061     1037423  |    1245484
                 |                        |
            Risk |    .05967    .0098725  |   .0181913
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |         .0497975       |     .048762    .0508329
      Risk ratio |         6.044037       |    5.890475    6.201604
 Attr. frac. ex. |         .8345477       |    .8302344    .8387514
 Attr. frac. pop |          .457294       |
                 +-----------------------------------------------
                              chi2(1) = 24062.00  Pr>chi2 = 0.0000

.
. * 180-day mortality
. tab died_91_180_crossover infected if alive_day91_crosscasecontrol==1
, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_91_18 |
0_crossove |       infected
         r |         0          1 |     Total
-----------+----------------------+----------
         0 |   957,712    193,579 | 1,151,291
           |     99.14      98.96 |     99.11
-----------+----------------------+----------
         1 |     8,335      2,044 |    10,379
           |      0.86       1.04 |      0.89
-----------+----------------------+----------
     Total |   966,047    195,623 | 1,161,670
           |    100.00     100.00 |    100.00

. cs died_91_180_crossover infected if alive_day91_crosscasecontrol==1

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      2044        8335  |      10379
        Noncases |    193579      957712  |    1151291
-----------------+------------------------+-----------
           Total |    195623      966047  |    1161670
                 |                        |
            Risk |  .0104487    .0086279  |   .0089346
```

```
                |                         |
                |      Point estimate     |    [95% conf. interval]
                |-------------------------+------------------------
 Risk difference |          .0018207       |    .0013338    .0023076
      Risk ratio |          1.211026       |    1.154118    1.270741
 Attr. frac. ex. |          .1742542       |    .1335377    .2130574
 Attr. frac. pop |          .0343169       |
                +-------------------------------------------------
                              chi2(1) =    60.90  Pr>chi2 = 0.0000

.
. * 365-day mortality
. tab died_181_365_crossover infected if
alive_day181_crosscasecontrol==1 , co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_181_3 |
65_crossov |       infected
       er |         0          1 |     Total
----------+----------------------+----------
         0 |   930,617    190,130 | 1,120,747
           |     98.19      98.23 |     98.20
----------+----------------------+----------
         1 |    17,158      3,432 |    20,590
           |      1.81       1.77 |      1.80
----------+----------------------+----------
     Total |   947,775    193,562 | 1,141,337
           |    100.00     100.00 |    100.00

. cs died_181_365_crossover infected if alive_day181_crosscasecontrol==1

                |        infected         |
                |   Exposed   Unexposed   |      Total
----------------+-------------------------+-----------
          Cases |      3432       17158   |      20590
       Noncases |    190130      930617   |    1120747
----------------+-------------------------+-----------
          Total |    193562      947775   |    1141337
                |                         |
           Risk |  .0177308    .0181035   |   .0180402
                |                         |
                |      Point estimate     |    [95% conf. interval]
                |-------------------------+------------------------
 Risk difference |        -.0003727        |    -.001019    .0002736
      Risk ratio |         .9794128        |    .9444768    1.015641
 Prev. frac. ex. |         .0205872        |   -.0156411    .0555232
 Prev. frac. pop |         .0034914        |
                +-------------------------------------------------
```

```
                          chi2(1) =     1.26  Pr>chi2 = 0.2616

.
. * 730-day mortality
. tab died_366_730_crossover infected if
alive_day366_crosscasecontrol==1, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_366_7 |
30_crossov |       infected
       er |         0          1 |     Total
----------+----------------------+----------
         0 |   861,248    179,086 | 1,040,334
           |     98.64      98.61 |     98.64
----------+----------------------+----------
         1 |    11,877      2,517 |    14,394
           |      1.36       1.39 |      1.36
----------+----------------------+----------
     Total |   873,125    181,603 | 1,054,728
           |    100.00     100.00 |    100.00

. cs died_366_730_crossover infected if alive_day366_crosscasecontrol==1

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      2517       11877  |      14394
       Noncases |    179086      861248  |    1040334
----------------+------------------------+-----------
          Total |    181603      873125  |    1054728
                |                        |
           Risk |  .0138599    .0136029  |   .0136471
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |          .000257       |    -.000333    .0008471
      Risk ratio |         1.018896       |    .9762958    1.063355
 Attr. frac. ex. |         .0185456       |   -.0242797    .0595803
 Attr. frac. pop |          .003243       |
                +-------------------------------------------------
                          chi2(1) =     0.74  Pr>chi2 = 0.3903

.
.
.
*****************************************************************
*
. * Per Protocol #1 - Cox Models: Censoring at Crossover Infections
```

```
(Unadjusted) *
.
*****************************************************************************
*
.
. *---------------------------
. * Prepping for Cox Models
. *---------------------------
.
. ** Censoring at 730 Days -Or- Among Comparators, at Infection
Crossover **
.
. * count number who were COVID+ prior to death or study end
. count if ttinfection730
(13,998 real changes made)

. replace tte_730_cross = indextodeath_caseindex if
indextodeath_caseindex730
(1,150,277 real changes made)

. replace died_730_cross = 0 if indextodeath_caseindex>ttinfection
(12,311 real changes made)

. replace died_730_cross = 0 if (indextodeath_caseindex>ttstudyend) &
(inrange(indextodeath_caseindex, 0, 730)) ///
>
& (inrange(ttstudyend, 0, 730))
(10,817 real changes made)

.
. tab died_730_cross

died_730_cr |
        oss |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |  1,173,405       94.21       94.21
          1 |     72,079        5.79      100.00
------------+-----------------------------------
      Total |  1,245,484      100.00

.
. *---------------------------------
. * Per Protocol #1: Cox Models
. *---------------------------------
.
. preserve

.
.         * stset data
.         sort uniq_patid

.         stset tte_730_cross, failure(died_730_cross) id(uniq_patid)

Survival-time data settings
```

```
          ID variable: uniq_patid
        Failure event: died_730_cross!=0 & died_730_cross<.
Observed time interval: (tte_730_cross[_n-1], tte_730_cross]
     Exit on or before: failure

--------------------------------------------------------------------------
--
  1,245,484  total observations
        347  observations end on or before enter()
--------------------------------------------------------------------------
--
  1,245,137  observations remaining, representing
  1,245,137  subjects
     71,738  failures in single-failure-per-subject data
  575765083  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
730

.         stsplit period, at(0 90 180 365 730)
(3,457,111 observations (episodes) created)

.
.         * create new interaction variables after splitting data
.         gen timeinfected_0_90 = infected * (tte_730_cross<=90)

.         gen timeinfected_91_180 = infected * (tte_730_cross>90 &
tte_730_cross<=180)

.         gen timeinfected_181_365 = infected * (tte_730_cross>180 &
tte_730_cross<=365)

.         gen timeinfected_366_730 = infected * (tte_730_cross>365 &
tte_730_cross<=730)

.
.         * cox model
.         stcox   i.timeinfected_0_90 i.timeinfected_91_180
i.timeinfected_181_365  ///
>                         i.timeinfected_366_730
///
>                         , efron vce(cluster patienticn)
strata(matchgroupnumber)

        Failure _d: died_730_cross
  Analysis time _t: tte_730_cross
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -123060.13
Iteration 1:   log pseudolikelihood = -116684.28
```

```
Iteration 2:   log pseudolikelihood = -114516.47
Iteration 3:   log pseudolikelihood = -114388.85
Iteration 4:   log pseudolikelihood = -114388.84
Refining estimates:
Iteration 0:   log pseudolikelihood = -114388.84

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects = 1,245,137                         Number of obs =
4,702,248
No. of failures =    71,738
Time at risk    = 575765083
                                                    Wald chi2(4)  =
22970.84
Log pseudolikelihood = -114388.84                   Prob > chi2   =
0.0000

                                (Std. err. adjusted for 1,091,935
clusters in patienticn)
------------------------------------------------------------------------------
                     |               Robust
                  _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
---------------------+--------------------------------------------------------
  1.timeinfected_0_90 |   6.357467   .0777116   151.32   0.000
6.206965    6.511618
 1.timeinfected_91_180 |   1.176034   .0264245     7.22   0.000
1.125366    1.228982
1.timeinfected_181_365 |    .920783   .0164475    -4.62   0.000
.8891043    .9535903
1.timeinfected_366_730 |   .8922076   .0181327    -5.61   0.000
.8573668    .9284643
------------------------------------------------------------------------------

.
. restore

.
.
.
. *------------------------------
. * Preparing dataset for IPCWs
. *------------------------------
.
. *save Data\prepdata_pp1_ipcw, replace
.
. preserve

.
.         * open dataset
```

```
.         use Data\prepdata_pp1_ipcw, clear
(Created in file
'P:\ORD_Ioannou_202104007D\MethodsGroup\Programs\CORC_DataExplor)

.
.         * create a fractional tte_730_cross variable by dividing by 32
.         gen tte_month_cross = tte_730_cross/32

.
.         * keep only variables needed for analysis
.         keep    /* patient identifiers*/
///
>                         matchgroupnumber patienticn uniq_patid case
index_dt    ///
>                         index_dt_case
///
>                         /* covariates */
///
>                         ageatindexdate bmi ethnicity3cat smoking4cat
///
>                         gagne numipadmits util_numpcstops
util_numscstops             ///
>                         nosos11cat canscore7cat neareststa3ndistance
///
>                         /*variables for subgroup analyses*/
///
>                         pr_died0_90_tertile pr_died181_730_tertile
///
>                         age_less65_case age_65to85_case
age_more85_case                   ///
>                         gagne_tertile_case
///
>                         /*variables for cox models*/
///
>                         tte_month_cross died_730_cross tte_730_cross

.
.         * organize dataset
.         order uniq_patid, after(patienticn)

.         order index_dt_case, after(index_dt)

.
.         * set up dataset for analysis in SAS
.         expand tte_month_cross +1 //+1 so that we can include  month 0
(1,198,827 noninteger counts rounded to integer)
(18,019,710 observations created)

.         bysort matchgroupnumber patienticn: gen monthend=_n

.
.         gen month = monthend-1

.
```

```
.         * drop expanded months in which the tte month is less than or
equal to the
.         * start of the month; in the expand command, tte months that
were x.5
.         * added an additional month. we want to confirm that the tte
month
.         * always exceeds the start of the month
.         drop if tte_month_cross<=month & tte_month_cross!=0
(670,801 observations deleted)

.
.         * create mortality variable
.         bysort matchgroupnumber patienticn: gen N = _N

.         gen died = 0

.         replace died = 1 if died_730_cross==1 & monthend==N
(72,079 real changes made)

.
.         * identify the last observation in the panel. this will be
used for
.         * filling in the new tte variable created (below) with the
value in
.         * the tte_month_cross variable for the last month the subject
is in the study
.         gsort matchgroupnumber patienticn -month

.         by matchgroupnumber patienticn: gen lastnum = _n

.
.         * create tte
.         gen tte=monthend

.
.                 * replace the new tte with the tte_month_cross
variable in the month when
.                 * tte occurs
.                 replace tte = tte_month_cross if lastnum==1
(1,199,174 real changes made)

.
.         sort matchgroupnumber patienticn month

.
.         * censor each month unless it is a month when a patient dies
.         gen censor = 1

.         replace censor = 0 if died==1
(72,079 real changes made)

.
.         * merge in IPCWs
.         bysort matchgroupnumber patienticn (monthend): gen panel_n=_n
```

```
.         merge 1:1 matchgroupnumber patienticn panel_n using
Data\IPCW\ipcw_trunc

    Result                      Number of obs
    -----------------------------------------
    Not matched                     2,112,906
        from master                         0  (_merge==1)
        from using                  2,112,906  (_merge==2)

    Matched                        18,594,393  (_merge==3)
    -----------------------------------------

.         drop if _merge==2
(2,112,906 observations deleted)

.
.         * drop variables not needed for analysis
.         drop died_730_cross tte_730_cross tte_month_cross monthend N
smdate year _merge panel_n

.
.         * organize variables in dataset
.         order matchgroupnumber patienticn uniq_patid case index_dt
index_dt_case month tte died censor ipcw

.
.         * save dataset for inclusion of IPCWs
.         *save Data\mortality_pp1_ipcw_20221215, replace
.
. restore

.
.
. ***********************************
. * PP2: With Censoring, Unweighted *
. ***********************************
.
. use Data\prepdata_pp1_ipcw, clear
(Created in file
'P:\ORD_Ioannou_202104007D\MethodsGroup\Programs\CORC_DataExplor)

.
. * check ttinfection with negative values
. sum ttinfection

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
 ttinfection |    137,326    338.8583    179.3397          0        867

. count if ttinfection==0
  6

.
```

```
. * identify the earliest infection crossover for the strata
. gsort matchgroupnumber propensityscoreabsdiffrank -case

. by matchgroupnumber: egen ttinfection_strata = min(ttinfection)
(630,819 missing values generated)

.
. *------------------------------------------------------------------
----------
. * identify those who die during each period;
. * those who die after infection crossover are coded as not dead at the
time of
. * crossover
. *------------------------------------------------------------------
----------
.
. * Died Index Day-Day 90;
. gen died_0_90_stratacrossover = .
(1,245,484 missing values generated)

. replace died_0_90_stratacrossover = 1 if
inrange(indextodeath_caseindex, 0, 90)
(23,814 real changes made)

. replace died_0_90_stratacrossover = 0 if indextodeath_caseindex>90
(1,221,670 real changes made)

. replace died_0_90_stratacrossover = 0 if
indextodeath_caseindex>ttinfection_strata
(1,685 real changes made)

. tab died_0_90 died_0_90_stratacrossover, m

           | died_0_90_stratacross
           |          over
 died_0_90 |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,221,670          0 | 1,221,670
         1 |     1,685     22,129 |    23,814
-----------+----------------------+----------
     Total | 1,223,355     22,129 | 1,245,484

.
. * Died Day 91-180;
. gen died_91_180_stratacrossover = .
(1,245,484 missing values generated)

. replace died_91_180_stratacrossover = 1 if
inrange(indextodeath_caseindex, 91, 180)
(12,359 real changes made)

. replace died_91_180_stratacrossover = 0 if indextodeath_caseindex>180
(1,209,311 real changes made)
```

```
. replace died_91_180_stratacrossover = 0 if
indextodeath_caseindex>ttinfection_strata
(4,058 real changes made)

. replace died_91_180_stratacrossover = 0 if
(indextodeath_caseindex>ttstudyend) & (inrange(indextodeath_caseindex,
91, 180)) ///
>
& (inrange(ttstudyend, 91, 180))
(0 real changes made)

. tab died_91_180 died_91_180_stratacrossover, m //missing represents
those who were censored in period 1

died_91_18 |   died_91_180_stratacrossover
         0 |         0          1          . |     Total
-----------+---------------------------------+----------
         0 | 1,209,311          0          0 | 1,209,311
         1 |     2,373      9,986          0 |    12,359
         . |     1,685          0     22,129 |    23,814
-----------+---------------------------------+----------
     Total | 1,213,369      9,986     22,129 | 1,245,484


.
. * Died Day 181-365;
. gen died_181_365_stratacrossover = .
(1,245,484 missing values generated)

. replace died_181_365_stratacrossover = 1 if
inrange(indextodeath_caseindex, 181, 365)
(26,130 real changes made)

. replace died_181_365_stratacrossover = 0 if indextodeath_caseindex>365
(1,183,181 real changes made)

. replace died_181_365_stratacrossover = 0 if
indextodeath_caseindex>ttinfection_strata
(12,102 real changes made)

. replace died_181_365_stratacrossover = 0 if
(indextodeath_caseindex>ttstudyend) & (inrange(indextodeath_caseindex,
181, 365)) ///
>
& (inrange(ttstudyend, 181, 365))
(37 real changes made)

. tab died_181_365 died_181_365_stratacrossover, m //missing represents
those who were censored in period 1&2

died_181_3 |   died_181_365_stratacrossover
        65 |         0          1          . |     Total
-----------+---------------------------------+----------
         0 | 1,183,244          0          0 | 1,183,244
         1 |     8,018     18,049          0 |    26,067
```

```
         . |     4,058          0     32,115 |    36,173
-----------+---------------------------------+----------
     Total | 1,195,320     18,049     32,115 | 1,245,484

.
. * Died Day 366-730;
. gen died_366_730_stratacrossover = .
(1,245,484 missing values generated)

. replace died_366_730_stratacrossover = 1 if
inrange(indextodeath_caseindex, 366, 730)
(32,904 real changes made)

. replace died_366_730_stratacrossover = 0 if indextodeath_caseindex>730
(1,150,277 real changes made)

. replace died_366_730_stratacrossover = 0 if
indextodeath_caseindex>ttinfection_strata
(28,416 real changes made)

. replace died_366_730_stratacrossover = 0 if
(indextodeath_caseindex>ttstudyend) & (inrange(indextodeath_caseindex,
366, 730)) ///
>
& (inrange(ttstudyend, 366, 730))
(5,987 real changes made)

.
. tab died_366_730 died_366_730_stratacrossover, m //missing represents
those who were censored in period 1-3

died_366_7 |   died_366_730_stratacrossover
        30 |         0          1          . |     Total
-----------+---------------------------------+----------
         0 | 1,162,593          0          0 | 1,162,593
         1 |     9,985     10,603          0 |    20,588
         . |    12,102          0     50,201 |    62,303
-----------+---------------------------------+----------
     Total | 1,184,680     10,603     50,201 | 1,245,484

.
. *-----------------------------------------------------------------
----------
. * for each period, identify whether the case and at least one
comparator
. * in a matched group are alive on the first day of the period, AND
. * their strata does not have an infection crossover in the prior
period(s)
. *-----------------------------------------------------------------
----------
.
. * Alive on day 91 & no strata crossover in prior period
. gen alive_day91_stratacrossover = .
(1,245,484 missing values generated)
```

```
. replace alive_day91_stratacrossover = 1 if indextodeath_caseindex>=91
(1,221,670 real changes made)

. replace alive_day91_stratacrossover = 0 if
inrange(indextodeath_caseindex, 0, 90)
(23,814 real changes made)

. replace alive_day91_stratacrossover = 0 if inrange(ttinfection_strata,
0, 90)
(93,866 real changes made)

. replace alive_day91_stratacrossover = 0 if ttstudyend<91
(0 real changes made)

.
. sum ttinfection_strata if inrange(ttinfection_strata, 0, 90)

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
ttinfectio~a |     97,014    45.60414    22.58688          0         90

. tab alive_day91 alive_day91_stratacrossover, m

           | alive_day91_stratacro
alive_day9 |        ssover
         1 |         0          1 |     Total
-----------+----------------------+----------
         0 |    23,814          0 |    23,814
         1 |    93,866  1,127,804 | 1,221,670
-----------+----------------------+----------
     Total |   117,680  1,127,804 | 1,245,484

.
. * Alive on day 181 & no strata crossover in prior periods
. gen alive_day181_stratacrossover = .
(1,245,484 missing values generated)

. replace alive_day181_stratacrossover = 1 if
indextodeath_caseindex>=181
(1,209,311 real changes made)

. replace alive_day181_stratacrossover = 0 if
inrange(indextodeath_caseindex, 0, 180)
(36,173 real changes made)

. replace alive_day181_stratacrossover = 0 if
inrange(ttinfection_strata, 0, 180)
(158,980 real changes made)

. replace alive_day181_stratacrossover = 0 if ttstudyend<181
(0 real changes made)

.
```

```
. sum ttinfection_strata if inrange(ttinfection_strata, 0, 180)

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
ttinfectio~a |    166,097    83.04211    50.51589          0        180

. tab alive_day181 alive_day181_stratacrossover

           | alive_day181_stratacr
alive_day1 |        ossover
        81 |         0          1 |     Total
-----------+----------------------+----------
         0 |    36,173          0 |    36,173
         1 |   158,980  1,050,331 | 1,209,311
-----------+----------------------+----------
     Total |   195,153  1,050,331 | 1,245,484

.
. * Alive on day 366 & no strata crossover in prior periods
. gen alive_day366_stratacrossover = .
(1,245,484 missing values generated)

. replace alive_day366_stratacrossover = 1 if
indextodeath_caseindex>=366
(1,183,181 real changes made)

. replace alive_day366_stratacrossover = 0 if
inrange(indextodeath_caseindex, 0, 365)
(62,303 real changes made)

. replace alive_day366_stratacrossover = 0 if
inrange(ttinfection_strata, 0, 365)
(348,881 real changes made)

. replace alive_day366_stratacrossover = 0 if ttstudyend<366
(33,944 real changes made)

.
. sum ttinfection_strata if inrange(ttinfection_strata, 0, 365)

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
ttinfectio~a |    371,401    192.4092    111.3391          0        365

. tab alive_day366 alive_day366_stratacrossover

           | alive_day366_stratacr
alive_day3 |        ossover
        66 |         0          1 |     Total
-----------+----------------------+----------
         0 |   114,374          0 |   114,374
         1 |   330,754    800,356 | 1,131,110
-----------+----------------------+----------
     Total |   445,128    800,356 | 1,245,484
```

```
.
. *-------------------------------------------------------------------
----------
. * for each period, identify whether the case and at least one
comparator
. * in a matched group are alive on the first day of the period & were
not
. * in an infection crossover strata in the prior period
. *-------------------------------------------------------------------
----------
.
. foreach i of numlist 91 181 366 {
  2.
.         //cases
.         gen alive_day`i'_stratacase = 0
  3.         replace alive_day`i'_stratacase = 1 if case==1 &
alive_day`i'_stratacrossover==1
  4.         replace alive_day`i'_stratacase = 0 if case==1 &
ttstudyend<`i'
  5.         tab alive_day`i'_stratacase alive_day`i'_stratacrossover if
case==1
  6.         sum indextodeath if indextodeath<`i' & case==1
  7.
.         bysort matchgroupnumber: egen alive_day`i'_stratacase_grp =
max(alive_day`i'_stratacase)
  8.
.         //comparators
.         gen alive_day`i'_stratacontrol = 0
  9.         replace alive_day`i'_stratacontrol = 1 if case==0 &
alive_day`i'_stratacrossover==1
 10.         replace alive_day`i'_stratacontrol = 0 if case==0 &
ttstudyend<`i'
 11.
.         tab alive_day`i'_stratacontrol alive_day`i'_stratacrossover if
case==0
 12.         sum indextodeath if indextodeath<`i' & case==0
 13.
.         bysort matchgroupnumber: egen alive_day`i'_stratacontrol_num =
sum(alive_day`i'_stratacontrol)
 14.
.         //case and at least one comparator alive on day`i'
.         gen alive_day`i'_stratacasecontrol = 0
 15.         replace alive_day`i'_stratacasecontrol = 1 if
alive_day`i'_stratacase_grp==1 & alive_day`i'_stratacontrol_num>=1
 16.
.         tab alive_day`i'_stratacasecontrol case
 17.
.         //drop variables we no longer need
.         drop alive_day`i'_stratacase alive_day`i'_stratacase_grp
alive_day`i'_stratacontrol alive_day`i'_stratacontrol_num
 18.
. }
(180,575 real changes made)
```

```
(0 real changes made)

alive_day9 | alive_day91_stratacro
1_strataca |        ssover
        se |         0          1 |     Total
-----------+----------------------+----------
         0 |    27,486          0 |    27,486
         1 |         0    180,575 |   180,575
-----------+----------------------+----------
     Total |    27,486    180,575 |   208,061

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     12,415    22.35747    19.79229          0         90
(947,229 real changes made)
(0 real changes made)

alive_day9 | alive_day91_stratacro
1_strataco |        ssover
     ntrol |         0          1 |     Total
-----------+----------------------+----------
         0 |    90,194          0 |    90,194
         1 |         0    947,229 |   947,229
-----------+----------------------+----------
     Total |    90,194    947,229 | 1,037,423

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     11,399      44.554    25.89809          0         90
(1,080,852 real changes made)

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
alive_day9 | covid-19 test result
1_strataca |          for
 secontrol |         0          1 |     Total
-----------+----------------------+----------
         0 |   137,142     27,490 |   164,632
         1 |   900,281    180,571 | 1,080,852
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
(167,998 real changes made)
(0 real changes made)

alive_day1 | alive_day181_stratacr
81_stratac |        ossover
       ase |         0          1 |     Total
-----------+----------------------+----------
         0 |    40,063          0 |    40,063
         1 |         0    167,998 |   167,998
-----------+----------------------+----------
     Total |    40,063    167,998 |   208,061
```

```
    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     14,459    38.05222    43.91964          0        180
(882,333 real changes made)
(0 real changes made)

alive_day1 | alive_day181_stratacr
81_stratac |        ossover
    ontrol |         0          1 |     Total
-----------+----------------------+----------
         0 |   155,090          0 |   155,090
         1 |         0    882,333 |   882,333
-----------+----------------------+----------
     Total |   155,090    882,333 | 1,037,423

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     21,714    87.84411    52.42273          0        180
(1,005,700 real changes made)

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
alive_day1 | covid-19 test result
81_stratac |          for
asecontrol |         0          1 |     Total
-----------+----------------------+----------
         0 |   199,715     40,069 |   239,784
         1 |   837,708    167,992 | 1,005,700
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
(128,351 real changes made)
(0 real changes made)

alive_day3 | alive_day366_stratacr
66_stratac |        ossover
       ase |         0          1 |     Total
-----------+----------------------+----------
         0 |    79,710          0 |    79,710
         1 |         0    128,351 |   128,351
-----------+----------------------+----------
     Total |    79,710    128,351 |   208,061

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     17,900    83.07486    103.0125          0        365
(672,005 real changes made)
(0 real changes made)

alive_day3 | alive_day366_stratacr
66_stratac |        ossover
    ontrol |         0          1 |     Total
-----------+----------------------+----------
         0 |   365,418          0 |   365,418
```

```
         1 |         0    672,005 |   672,005
-----------+----------------------+----------
     Total |   365,418    672,005 | 1,037,423

    Variable |        Obs        Mean    Std. dev.       Min        Max
-------------+---------------------------------------------------------
indextodea~x |     44,403       182.9    106.9272          0        365
(768,170 real changes made)

           |     indicator: is
           |  `index_dt` the date
           | of the first positive
alive_day3 | covid-19 test result
66_stratac |          for
asecontrol |         0          1 |     Total
-----------+----------------------+----------
         0 |   397,595     79,719 |   477,314
         1 |   639,828    128,342 |   768,170
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484


.
.
. *-----------------
. * PP2 Results
. *-----------------
.
.         /*
>
>         Criteria
>            1)   Case and at least 1 comparator in the strata must be
alive on the
>                         first day of the period
>
>            2)   Everyone in the strata who was censored due to a
strata infection
>                         crossover in the previous period is excluded
in the current period
>
>            3)   People who die after the infection crossover are
considered alive
>                         at the time of the infection crossover
>         */
.
.
.
. * Overall *
.
. * 90-day mortality
. tab died_0_90_stratacrossover infected , co

+-------------------+
| Key               |
|-------------------|
```

```
|     frequency     |
| column percentage |
+-------------------+

died_0_90_ |
stratacros |       infected
     sover |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,027,496    195,859 | 1,223,355
           |     99.04      94.14 |     98.22
-----------+----------------------+----------
         1 |     9,927     12,202 |    22,129
           |      0.96       5.86 |      1.78
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
           |    100.00     100.00 |    100.00

. cs died_0_90_stratacrossover infected

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |     12202        9927  |      22129
       Noncases |    195859     1027496  |    1223355
----------------+------------------------+-----------
          Total |    208061     1037423  |    1245484
                |                        |
           Risk |  .0586463    .0095689  |   .0177674
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0490774       |    .0480505    .0501042
      Risk ratio |         6.128839       |    5.971127    6.290716
 Attr. frac. ex. |          .836837       |    .8325274    .8410356
 Attr. frac. pop |         .4614345       |
                +-------------------------------------------------
                             chi2(1) = 23918.44  Pr>chi2 = 0.0000


.
. * 180-day mortality
. tab died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 , co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_91_18 |
0_stratacr |       infected
   ossover |         0          1 |     Total
-----------+----------------------+----------
```

```
          0 |   884,062    178,780 | 1,062,842
            |     99.15      99.01 |     99.13
------------+----------------------+----------
          1 |     7,566      1,791 |     9,357
            |      0.85       0.99 |      0.87
------------+----------------------+----------
      Total |   891,628    180,571 | 1,072,199
            |    100.00     100.00 |    100.00

. cs died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1791        7566  |       9357
       Noncases |    178780      884062  |    1062842
----------------+------------------------+-----------
          Total |    180571      891628  |    1072199
                |                        |
           Risk |  .0099185    .0084856  |   .0087269
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0014329       |    .0009378    .0019281
      Risk ratio |         1.168867       |    1.110466    1.230338
 Attr. frac. ex. |         .1444704       |    .0994775    .1872152
 Attr. frac. pop |         .0276527       |
                +-------------------------------------------------
                              chi2(1) =    35.64  Pr>chi2 = 0.0000

.
. * 365-day mortality
. tab died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 , co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_181_3 |
65_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   808,442    165,330 |   973,772
           |     98.29      98.42 |     98.31
-----------+----------------------+----------
         1 |    14,035      2,662 |    16,697
           |      1.71       1.58 |      1.69
-----------+----------------------+----------
     Total |   822,477    167,992 |   990,469
```

```
           |    100.00     100.00 |    100.00

. cs died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      2662       14035  |      16697
        Noncases |    165330      808442  |     973772
-----------------+------------------------+-----------
           Total |    167992      822477  |     990469
                 |                        |
            Risk |   .015846    .0170643  |   .0168577
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |        -.0012183       |   -.0018778   -.0005588
      Risk ratio |         .9286045       |    .8912122    .9675657
 Prev. frac. ex. |         .0713955       |    .0324343    .1087878
 Prev. frac. pop |         .0121093       |
                 +-----------------------------------------------
                              chi2(1) =    12.49  Pr>chi2 = 0.0004


.
. * 730-day mortality
. tab died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 , co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_366_7 |
30_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   608,168    126,869 |   735,037
           |     98.73      98.85 |     98.75
-----------+----------------------+----------
         1 |     7,833      1,473 |     9,306
           |      1.27       1.15 |      1.25
-----------+----------------------+----------
     Total |   616,001    128,342 |   744,343
           |    100.00     100.00 |    100.00

. cs died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
```

```
-----------------+------------------------+-----------
           Cases |      1473        7833  |      9306
       Noncases |    126869      608168  |    735037
-----------------+------------------------+-----------
           Total |    128342      616001  |    744343
                 |                        |
            Risk |  .0114771    .0127159  |   .0125023
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |        -.0012387       |   -.0018852   -.0005923
      Risk ratio |         .9025832       |    .8539939    .9539371
 Prev. frac. ex. |         .0974168       |    .0460629    .1460061
 Prev. frac. pop |         .0167969       |
                 +-----------------------------------------------
                              chi2(1) =    13.20  Pr>chi2 = 0.0003


.
. *-----------
. * Age <65
. *-----------
.
. * 90-day mortality
. tab died_0_90_stratacrossover infected if agecat==1, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_0_90_ |
stratacros |       infected
     sover |         0          1 |     Total
-----------+----------------------+----------
         0 |   553,690    113,678 |   667,368
           |     99.72      98.82 |     99.57
-----------+----------------------+----------
         1 |     1,527      1,363 |     2,890
           |      0.28       1.18 |      0.43
-----------+----------------------+----------
     Total |   555,217    115,041 |   670,258
           |    100.00     100.00 |    100.00

. cs died_0_90_stratacrossover infected if agecat==1

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      1363        1527  |       2890
       Noncases |    113678      553690  |     667368
-----------------+------------------------+-----------
           Total |    115041      555217  |     670258
```

```
                |                           |
           Risk |  .0118479    .0027503     |    .0043118
                |                           |
                |      Point estimate       |    [95% conf. interval]
                |---------------------------+------------------------
 Risk difference |         .0090977          |    .0084574    .0097379
      Risk ratio |         4.307913          |    4.005608    4.633033
 Attr. frac. ex. |          .767869          |      .75035    .7841587
 Attr. frac. pop |         .3621472          |
                +-------------------------------------------------
                                  chi2(1) =  1837.19  Pr>chi2 = 0.0000

.
. * 180-day mortality
. tab died_91_180_stratacrossover infected if
alive_day91_strataca secontrol==1 & agecat==1, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_91_18 |
0_stratacr |       infected
   ossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   483,658    104,745 |   588,403
           |     99.76      99.75 |     99.76
-----------+----------------------+----------
         1 |     1,143        260 |     1,403
           |      0.24       0.25 |      0.24
-----------+----------------------+----------
     Total |   484,801    105,005 |   589,806
           |    100.00     100.00 |    100.00

. cs died_91_180_stratacrossover infected if
alive_day91_strataca secontrol==1 & agecat==1

                |        infected           |
                |   Exposed   Unexposed     |      Total
----------------+---------------------------+-----------
          Cases |       260        1143     |       1403
       Noncases |    104745      483658     |     588403
----------------+---------------------------+-----------
          Total |    105005      484801     |     589806
                |                           |
           Risk |  .0024761    .0023577     |    .0023787
                |                           |
                |      Point estimate       |    [95% conf. interval]
                |---------------------------+------------------------
 Risk difference |         .0001184          |   -.0002117    .0004486
      Risk ratio |         1.050221          |    .9180504     1.20142
```

```
 Attr. frac. ex. |         .0478193       |   -.0892648    .1676514
 Attr. frac. pop |         .0088617       |
                 +-------------------------------------------------
                                chi2(1) =     0.51  Pr>chi2 = 0.4752

.
. * 365-day mortality
. tab died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & agecat==1, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_181_3 |
65_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   447,520     97,820 |   545,340
           |     99.52      99.57 |     99.53
-----------+----------------------+----------
         1 |     2,174        418 |     2,592
           |      0.48       0.43 |      0.47
-----------+----------------------+----------
     Total |   449,694     98,238 |   547,932
           |    100.00     100.00 |    100.00

. cs died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & agecat==1

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       418        2174  |       2592
       Noncases |     97820      447520  |     545340
----------------+------------------------+-----------
          Total |     98238      449694  |     547932
                |                        |
           Risk |   .004255    .0048344  |   .0047305
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0005794       |   -.0010342   -.0001247
      Risk ratio |         .8801452       |    .7928536    .9770474
 Prev. frac. ex. |         .1198548       |    .0229526    .2071464
 Prev. frac. pop |         .0214886       |
                 +-------------------------------------------------
                                chi2(1) =     5.75  Pr>chi2 = 0.0165

.
. * 730-day mortality
```

```
. tab died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & agecat==1, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_366_7 |
30_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   338,682     75,282 |   413,964
           |     99.64      99.73 |     99.65
-----------+----------------------+----------
         1 |     1,239        205 |     1,444
           |      0.36       0.27 |      0.35
-----------+----------------------+----------
     Total |   339,921     75,487 |   415,408
           |    100.00     100.00 |    100.00

. cs died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & agecat==1

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       205        1239  |       1444
       Noncases |     75282      338682  |     413964
----------------+------------------------+-----------
          Total |     75487      339921  |     415408
                |                        |
           Risk |  .0027157     .003645  |   .0034761
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0009293       |   -.0013522   -.0005063
      Risk ratio |         .7450551       |    .6428347    .8635301
 Prev. frac. ex. |         .2549449       |    .1364699    .3571653
 Prev. frac. pop |          .046328       |
                +-------------------------------------------------
                             chi2(1) =    15.40  Pr>chi2 = 0.0001

.
. *------------
. * Age 65-85
. *------------
.
. * 90-day mortality
. tab died_0_90_stratacrossover infected if agecat==2, co

+-------------------+
```

```
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_0_90_ |
stratacros |       infected
     sover |         0          1 |     Total
-----------+----------------------+----------
         0 |   425,403     74,600 |   500,003
           |     98.63      90.64 |     97.35
-----------+----------------------+----------
         1 |     5,898      7,701 |    13,599
           |      1.37       9.36 |      2.65
-----------+----------------------+----------
     Total |   431,301     82,301 |   513,602
           |    100.00     100.00 |    100.00

. cs died_0_90_stratacrossover infected if agecat==2

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      7701        5898  |      13599
       Noncases |     74600      425403  |     500003
----------------+------------------------+-----------
          Total |     82301      431301  |     513602
                |                        |
           Risk |  .0935712    .0136749  |   .0264777
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0798963       |    .0778766    .0819159
      Risk ratio |         6.842546       |     6.61987    7.072712
 Attr. frac. ex. |         .8538556       |    .8489396    .8586115
 Attr. frac. pop |         .4835313       |
                +-------------------------------------------------
                             chi2(1) = 17115.34  Pr>chi2 = 0.0000

.
. * 180-day mortality
. tab died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & agecat==2, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_91_18 |
0_stratacr |       infected
```

```
   ossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   361,087     67,472 |   428,559
           |     98.75      98.40 |     98.70
-----------+----------------------+----------
         1 |     4,561      1,098 |     5,659
           |      1.25       1.60 |      1.30
-----------+----------------------+----------
     Total |   365,648     68,570 |   434,218
           |    100.00     100.00 |    100.00

. cs died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & agecat==2

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1098        4561  |       5659
       Noncases |     67472      361087  |     428559
----------------+------------------------+-----------
          Total |     68570      365648  |     434218
                |                        |
           Risk |  .0160128    .0124737  |   .0130326
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0035391       |     .002533    .0045451
      Risk ratio |         1.283723       |     1.20248    1.370455
 Attr. frac. ex. |         .2210157       |    .1683855    .2703152
 Attr. frac. pop |         .0428831       |
                +-------------------------------------------------
                             chi2(1) =    56.23  Pr>chi2 = 0.0000

.
. * 365-day mortality
. tab died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & agecat==2, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_181_3 |
65_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   327,676     61,926 |   389,602
           |     97.46      97.46 |     97.46
-----------+----------------------+----------
         1 |     8,537      1,614 |    10,151
           |      2.54       2.54 |      2.54
```

```
-----------+----------------------+----------
     Total |   336,213     63,540 |   399,753
           |    100.00     100.00 |    100.00

. cs died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & agecat==2

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1614        8537  |      10151
       Noncases |     61926      327676  |     389602
----------------+------------------------+-----------
          Total |     63540      336213  |     399753
                |                        |
           Risk |  .0254013    .0253916  |   .0253932
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         9.68e-06       |   -.0013243    .0013436
      Risk ratio |         1.000381       |    .9491986    1.054324
 Attr. frac. ex. |         .0003811       |   -.0535203    .0515247
 Attr. frac. pop |         .0000606       |
                +-------------------------------------------------
                             chi2(1) =     0.00  Pr>chi2 = 0.9887

.
. * 730-day mortality
. tab died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & agecat==2, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_366_7 |
30_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   245,990     47,500 |   293,490
           |     98.12      98.07 |     98.12
-----------+----------------------+----------
         1 |     4,703        933 |     5,636
           |      1.88       1.93 |      1.88
-----------+----------------------+----------
     Total |   250,693     48,433 |   299,126
           |    100.00     100.00 |    100.00

. cs died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & agecat==2
```

```
                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |       933        4703  |       5636
        Noncases |     47500      245990  |     293490
-----------------+------------------------+-----------
           Total |     48433      250693  |     299126
                 |                        |
            Risk |  .0192637      .01876  |   .0188416
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |         .0005037       |   -.0008306    .0018381
      Risk ratio |         1.026851       |    .9578449    1.100829
 Attr. frac. ex. |          .026149       |   -.0440104    .0915936
 Attr. frac. pop |         .0043288       |
                 +-----------------------------------------------------
                              chi2(1) =     0.56  Pr>chi2 = 0.4554

.
. *------------
. * Age 85+
. *------------
.
. * 90-day mortality
. tab died_0_90_stratacrossover infected if agecat==3, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_0_90_ |
stratacros |       infected
     sover |         0          1 |     Total
-----------+----------------------+----------
         0 |    48,403      7,581 |    55,984
           |     95.08      70.72 |     90.85
-----------+----------------------+----------
         1 |     2,502      3,138 |     5,640
           |      4.92      29.28 |      9.15
-----------+----------------------+----------
     Total |    50,905     10,719 |    61,624
           |    100.00     100.00 |    100.00

. cs died_0_90_stratacrossover infected if agecat==3

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |      3138        2502  |       5640
        Noncases |      7581       48403  |      55984
```

```
-----------------+-------------------------+-----------
           Total |     10719       50905   |      61624
                 |                         |
            Risk |   .2927512    .0491504   |    .0915228
                 |                         |
                 |      Point estimate     |    [95% conf. interval]
                 |-------------------------+------------------------
 Risk difference |         .2436008        |    .2347844    .2524172
      Risk ratio |         5.956235        |    5.675809    6.250515
 Attr. frac. ex. |         .8321087        |    .8238137    .8400132
 Attr. frac. pop |         .4629711        |
                 +-------------------------------------------------
                               chi2(1) =  6319.45  Pr>chi2 = 0.0000


.
. * 180-day mortality
. tab died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & agecat==3, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_91_18 |
0_stratacr |       infected
   ossover |         0          1 |     Total
-----------+----------------------+----------
         0 |    39,317      6,563 |    45,880
           |     95.48      93.81 |     95.24
-----------+----------------------+----------
         1 |     1,862        433 |     2,295
           |      4.52       6.19 |      4.76
-----------+----------------------+----------
     Total |    41,179      6,996 |    48,175
           |    100.00     100.00 |    100.00

. cs died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & agecat==3

                 |        infected         |
                 |   Exposed   Unexposed   |      Total
-----------------+-------------------------+-----------
           Cases |       433        1862   |       2295
        Noncases |      6563       39317   |      45880
-----------------+-------------------------+-----------
           Total |      6996       41179   |      48175
                 |                         |
            Risk |   .0618925    .0452172  |   .0476388
                 |                         |
                 |      Point estimate     |    [95% conf. interval]
                 |-------------------------+------------------------
```

```
 Risk difference |         .0166753       |    .0106829    .0226677
      Risk ratio |         1.368782       |    1.236728    1.514935
 Attr. frac. ex. |         .2694234       |     .191415    .3399058
 Attr. frac. pop |         .0508324       |
                 +-------------------------------------------------
                              chi2(1) =    36.65  Pr>chi2 = 0.0000


.
. * 365-day mortality
. tab died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & agecat==3, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_181_3 |
65_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |    33,246      5,584 |    38,830
           |     90.91      89.86 |     90.76
-----------+----------------------+----------
         1 |     3,324        630 |     3,954
           |      9.09      10.14 |      9.24
-----------+----------------------+----------
     Total |    36,570      6,214 |    42,784
           |    100.00     100.00 |    100.00

. cs died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & agecat==3

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       630        3324  |       3954
       Noncases |      5584       33246  |      38830
----------------+------------------------+-----------
          Total |      6214       36570  |      42784
                |                        |
           Risk |   .101384    .0908942  |   .0924177
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0104898       |    .0024275    .0185521
      Risk ratio |         1.115407       |    1.028818    1.209283
 Attr. frac. ex. |          .103466       |    .0280109    .1730636
 Attr. frac. pop |         .0164855       |
                 +-------------------------------------------------
                              chi2(1) =     6.97  Pr>chi2 = 0.0083
```

```
.
. * 730-day mortality
. tab died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & agecat==3, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_366_7 |
30_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |    23,496      4,087 |    27,583
           |     92.55      92.42 |     92.53
-----------+----------------------+----------
         1 |     1,891        335 |     2,226
           |      7.45       7.58 |      7.47
-----------+----------------------+----------
     Total |    25,387      4,422 |    29,809
           |    100.00     100.00 |    100.00

. cs died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & agecat==3

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       335        1891  |       2226
       Noncases |      4087       23496  |      27583
----------------+------------------------+-----------
          Total |      4422       25387  |      29809
                |                        |
           Risk |  .0757576    .0744869  |   .0746754
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0012706       |   -.0071708    .0097121
      Risk ratio |         1.017058       |    .9095618     1.13726
 Attr. frac. ex. |         .0167724       |   -.0994306    .1206934
 Attr. frac. pop |         .0025241       |
                +-------------------------------------------------
                             chi2(1) =     0.09  Pr>chi2 = 0.7667

.
. *-----------
. * Wave 1
. *-----------
.
. * 90-day mortality
. tab died_0_90_stratacrossover infected if wave==1, co
```

```
+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_0_90_ |
stratacros |       infected
     sover |         0          1 |     Total
-----------+----------------------+----------
         0 |    88,652     16,271 |   104,923
           |     98.63      90.40 |     97.26
-----------+----------------------+----------
         1 |     1,231      1,728 |     2,959
           |      1.37       9.60 |      2.74
-----------+----------------------+----------
     Total |    89,883     17,999 |   107,882
           |    100.00     100.00 |    100.00

. cs died_0_90_stratacrossover infected if wave==1

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1728        1231  |       2959
       Noncases |     16271       88652  |     104923
----------------+------------------------+-----------
          Total |     17999       89883  |     107882
                |                        |
           Risk |  .0960053    .0136956  |   .0274281
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0823098       |    .0779394    .0866801
      Risk ratio |         7.009949       |    6.527367    7.528209
 Attr. frac. ex. |         .8573456       |    .8467989    .8671663
 Attr. frac. pop |         .5006736       |
                +-------------------------------------------------
                           chi2(1) =  3808.57  Pr>chi2 = 0.0000


.
. * 180-day mortality
. tab died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & wave==1, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+
```

```
died_91_18 |
0_stratacr |       infected
   ossover |         0          1 |     Total
-----------+----------------------+----------
         0 |    74,892     15,120 |    90,012
           |     98.82      98.32 |     98.73
-----------+----------------------+----------
         1 |       897        259 |     1,156
           |      1.18       1.68 |      1.27
-----------+----------------------+----------
     Total |    75,789     15,379 |    91,168
           |    100.00     100.00 |    100.00
```

```
. cs died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & wave==1
```

```
                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       259         897  |       1156
       Noncases |     15120       74892  |      90012
----------------+------------------------+-----------
          Total |     15379       75789  |      91168
                |                        |
           Risk |  .0168411    .0118355  |   .0126799
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0050057       |    .0028311    .0071802
      Risk ratio |         1.422936       |    1.240554    1.632131
 Attr. frac. ex. |         .2972278       |    .1939088    .3873041
 Attr. frac. pop |         .0665934       |
                +-------------------------------------------------
                             chi2(1) =    25.59  Pr>chi2 = 0.0000
```

```
.
. * 365-day mortality
. tab died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & wave==1, co
```

```
+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+
```

```
died_181_3 |
65_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |    66,998     13,740 |    80,738
           |     97.90      97.77 |     97.88
-----------+----------------------+----------
```

```
          1 |     1,437        314 |     1,751
            |      2.10       2.23 |      2.12
------------+----------------------+----------
      Total |    68,435     14,054 |    82,489
            |    100.00     100.00 |    100.00

. cs died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & wave==1

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       314        1437  |       1751
       Noncases |     13740       66998  |      80738
----------------+------------------------+-----------
          Total |     14054       68435  |      82489
                |                        |
           Risk |  .0223424     .020998  |   .0212271
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0013444       |   -.0013248    .0040135
      Risk ratio |         1.064023       |    .9430077    1.200569
 Attr. frac. ex. |         .0601711       |   -.0604367    .1670617
 Attr. frac. pop |         .0107902       |
                +-------------------------------------------------
                              chi2(1) =     1.01  Pr>chi2 = 0.3139


.
. * 730-day mortality
. tab died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & wave==1, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_366_7 |
30_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |    50,774     10,658 |    61,432
           |     96.89      96.69 |     96.85
-----------+----------------------+----------
         1 |     1,630        365 |     1,995
           |      3.11       3.31 |      3.15
-----------+----------------------+----------
     Total |    52,404     11,023 |    63,427
           |    100.00     100.00 |    100.00

. cs died_366_730_stratacrossover infected if
```

```
alive_day366_stratacasecontrol==1 & wave==1

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
           Cases |       365        1630  |       1995
        Noncases |     10658       50774  |      61432
-----------------+------------------------+-----------
           Total |     11023       52404  |      63427
                 |                        |
            Risk |  .0331126    .0311045  |   .0314535
                 |                        |
                 |      Point estimate    |    [95% conf. interval]
                 |------------------------+------------------------
 Risk difference |         .0020081       |    -.001648    .0056641
      Risk ratio |         1.064559       |     .952123    1.190273
 Attr. frac. ex. |         .0606442       |   -.0502844    .1598568
 Attr. frac. pop |         .0110953       |
                 +-------------------------------------------------
                              chi2(1) =     1.21  Pr>chi2 = 0.2722


.
. *-----------
. * Wave 2
. *-----------
.
. * 90-day mortality
. tab died_0_90_stratacrossover infected if wave==2, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_0_90_  |
stratacros  |       infected
     sover  |         0          1  |     Total
------------+----------------------+----------
          0 |   208,921     39,805  |   248,726
            |     99.09      94.22  |     98.27
------------+----------------------+----------
          1 |     1,925      2,441  |     4,366
            |      0.91       5.78  |      1.73
------------+----------------------+----------
      Total |   210,846     42,246  |   253,092
            |    100.00     100.00  |    100.00

. cs died_0_90_stratacrossover infected if wave==2

                 |        infected        |
                 |   Exposed   Unexposed  |      Total
-----------------+------------------------+-----------
```

```
          Cases |      2441        1925  |       4366
       Noncases |     39805      208921  |     248726
----------------+--------------------------+-----------
          Total |     42246      210846  |     253092
                |                          |
           Risk |  .0577806    .0091299  |   .0172506
                |                          |
                |      Point estimate      |    [95% conf. interval]
                |--------------------------+------------------------
 Risk difference |         .0486507         |     .046389    .0509124
      Risk ratio |         6.328734         |    5.967197    6.712175
 Attr. frac. ex. |         .8419905         |    .8324171     .851017
 Attr. frac. pop |          .470751         |
                +-------------------------------------------------
                                  chi2(1) =  4913.64  Pr>chi2 = 0.0000

.
. * 180-day mortality
. tab died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & wave==2, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_91_18 |
0_stratacr |       infected
   ossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   177,688     35,869 |   213,557
           |     99.16      98.97 |     99.13
-----------+----------------------+----------
         1 |     1,506        373 |     1,879
           |      0.84       1.03 |      0.87
-----------+----------------------+----------
     Total |   179,194     36,242 |   215,436
           |    100.00     100.00 |    100.00

. cs died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & wave==2

                |        infected          |
                |   Exposed   Unexposed    |      Total
----------------+--------------------------+-----------
          Cases |       373        1506    |       1879
       Noncases |     35869      177688    |     213557
----------------+--------------------------+-----------
          Total |     36242      179194    |     215436
                |                          |
           Risk |  .0102919    .0084043    |   .0087218
                |                          |
```

```
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0018876       |    .0007659    .0030094
      Risk ratio |         1.224603       |    1.093982     1.37082
 Attr. frac. ex. |         .1834085       |    .0859078    .2705095
 Attr. frac. pop |         .0364084       |
                +-------------------------------------------------
                              chi2(1) =    12.42  Pr>chi2 = 0.0004

.
. * 365-day mortality
. tab died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & wave==2, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_181_3 |
65_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   151,753     30,995 |   182,748
           |     98.44      98.49 |     98.45
-----------+----------------------+----------
         1 |     2,407        474 |     2,881
           |      1.56       1.51 |      1.55
-----------+----------------------+----------
     Total |   154,160     31,469 |   185,629
           |    100.00     100.00 |    100.00

. cs died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & wave==2

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       474        2407  |       2881
       Noncases |     30995      151753  |     182748
----------------+------------------------+-----------
          Total |     31469      154160  |     185629
                |                        |
           Risk |  .0150624    .0156136  |   .0155202
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0005512       |   -.0020324      .00093
      Risk ratio |         .9646972       |    .8748682     1.06375
 Prev. frac. ex. |         .0353028       |   -.0637496    .1251318
 Prev. frac. pop |         .0059848       |
                +-------------------------------------------------
```

```
                                chi2(1) =     0.52  Pr>chi2 = 0.4710

.
. * 730-day mortality
. tab died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & wave==2, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_366_7 |
30_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   130,557     27,143 |   157,700
           |     98.21      98.33 |     98.23
-----------+----------------------+----------
         1 |     2,386        461 |     2,847
           |      1.79       1.67 |      1.77
-----------+----------------------+----------
     Total |   132,943     27,604 |   160,547
           |    100.00     100.00 |    100.00

. cs died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & wave==2

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       461        2386  |       2847
       Noncases |     27143      130557  |     157700
----------------+------------------------+-----------
          Total |     27604      132943  |     160547
                |                        |
           Risk |  .0167005    .0179475  |   .0177331
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0012471       |   -.0029188    .0004246
      Risk ratio |         .9305162       |    .8429198    1.027216
 Prev. frac. ex. |         .0694838       |   -.0272157    .1570802
 Prev. frac. pop |         .0119468       |
                +-------------------------------------------------
                                chi2(1) =     2.04  Pr>chi2 = 0.1531

.
. *-----------
. * Wave 3
. *-----------
.
```

```
. * 90-day mortality
. tab died_0_90_stratacrossover infected if wave==3, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_0_90_ |
stratacros |       infected
     sover |         0          1 |     Total
-----------+----------------------+----------
         0 |   624,665    119,481 |   744,146
           |     99.06      94.45 |     98.29
-----------+----------------------+----------
         1 |     5,956      7,023 |    12,979
           |      0.94       5.55 |      1.71
-----------+----------------------+----------
     Total |   630,621    126,504 |   757,125
           |    100.00     100.00 |    100.00

. cs died_0_90_stratacrossover infected if wave==3

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      7023        5956  |      12979
       Noncases |    119481      624665  |     744146
----------------+------------------------+-----------
          Total |    126504      630621  |     757125
                |                        |
           Risk |   .055516    .0094447  |   .0171425
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0460714       |    .0447872    .0473556
      Risk ratio |         5.878035       |    5.681583    6.081279
 Attr. frac. ex. |         .8298751       |    .8239927    .8355609
 Attr. frac. pop |         .4490495       |
                +-------------------------------------------------
                             chi2(1) = 13274.04  Pr>chi2 = 0.0000

.
. * 180-day mortality
. tab died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & wave==3, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
```

```
+-------------------+

died_91_18 |
0_stratacr |       infected
   ossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   534,978    108,276 |   643,254
           |     99.18      99.10 |     99.16
-----------+----------------------+----------
         1 |     4,439        986 |     5,425
           |      0.82       0.90 |      0.84
-----------+----------------------+----------
     Total |   539,417    109,262 |   648,679
           |    100.00     100.00 |    100.00

. cs died_91_180_stratacrossover infected if
alive_day91_stratacasecontrol==1 & wave==3

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       986        4439  |       5425
       Noncases |    108276      534978  |     643254
----------------+------------------------+-----------
          Total |    109262      539417  |     648679
                |                        |
           Risk |  .0090242    .0082293  |   .0083632
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |         .0007949       |    .0001846    .0014053
      Risk ratio |         1.096598       |    1.023795    1.174577
 Attr. frac. ex. |         .0880884       |    .0232421    .1486296
 Attr. frac. pop |         .0160102       |
                +-------------------------------------------------
                              chi2(1) =     6.92  Pr>chi2 = 0.0085

.
. * 365-day mortality
. tab died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & wave==3, co

+-------------------+
| Key               |
|-------------------|
|     frequency     |
| column percentage |
+-------------------+

died_181_3 |
65_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   502,902    102,864 |   605,766
```

```
           |     98.24      98.41 |     98.27
-----------+----------------------+----------
         1 |     9,011      1,657 |    10,668
           |      1.76       1.59 |      1.73
-----------+----------------------+----------
     Total |   511,913    104,521 |   616,434
           |    100.00     100.00 |    100.00

. cs died_181_365_stratacrossover infected if
alive_day181_stratacasecontrol==1 & wave==3

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |      1657        9011  |      10668
       Noncases |    102864      502902  |     605766
----------------+------------------------+-----------
          Total |    104521      511913  |     616434
                |                        |
           Risk |  .0158533    .0176026  |    .017306
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0017493       |   -.0025879   -.0009108
      Risk ratio |         .9006211       |    .8550155    .9486593
 Prev. frac. ex. |         .0993789       |    .0513407    .1449845
 Prev. frac. pop |         .0168504       |
                +-------------------------------------------------
                             chi2(1) =    15.62  Pr>chi2 = 0.0001

.
. * 730-day mortality
. tab died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & wave==3, co

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_366_7 |
30_stratac |       infected
  rossover |         0          1 |     Total
-----------+----------------------+----------
         0 |   391,408     81,685 |   473,093
           |     99.10      99.26 |     99.13
-----------+----------------------+----------
         1 |     3,561        613 |     4,174
           |      0.90       0.74 |      0.87
-----------+----------------------+----------
     Total |   394,969     82,298 |   477,267
           |    100.00     100.00 |    100.00
```

```
. cs died_366_730_stratacrossover infected if
alive_day366_stratacasecontrol==1 & wave==3

                |        infected        |
                |   Exposed   Unexposed  |      Total
----------------+------------------------+-----------
          Cases |       613        3561  |       4174
       Noncases |     81685      391408  |     473093
----------------+------------------------+-----------
          Total |     82298      394969  |     477267
                |                        |
           Risk |  .0074485    .0090159  |   .0087456
                |                        |
                |      Point estimate    |    [95% conf. interval]
                |------------------------+------------------------
 Risk difference |        -.0015674       |   -.0022246   -.0009101
      Risk ratio |         .8261563       |    .7585497    .8997885
 Prev. frac. ex. |         .1738437       |    .1002115    .2414503
 Prev. frac. pop |         .0299769       |
                +-------------------------------------------------
                             chi2(1) =    19.30  Pr>chi2 = 0.0000

.
. *-----------------------------------------------------------------
. * PP2 Constructing TTE & Mortality Variables for Cox Model
. *-----------------------------------------------------------------
.
. * censor matched strata at the time of an infection crossover;
. * patients in a crossover strata who die prior to the infection
crossover
. * will have their TTE recorded as their individual date of death
.
. * censor everyone at the earliest censoring time of anyone in the
matched
. * strata, using earliest time of death, study end, or crossover
. gsort matchgroupnumber propensityscoreabsdiffrank -case

.
. * create a new tte variable from the crossover tte variable, censoring
everyone
. * in the strata at the time of the earliest infection crossover
. by matchgroupnumber: egen mkg_tte_730_strata = min(tte_730_cross) if
isfutureinfectedcontrol==1
(1,108,158 missing values generated)

. by matchgroupnumber: egen tte_730_strata = min(mkg_tte_730_strata)
(630,819 missing values generated)

.
. * if someone dies prior to the time of the earliest censoring date for
the strata,
. * recode THAT individual with the date of their death
. replace tte_730_strata = tte_730_cross if indextodeath_caseindex
```

```
!missing(tte_730_strata) & ///
>
indextodeath_caseindex
indextodeath_caseindex<730
(23,020 real changes made)

.
. * any strata not censored at crossover has a tte as done previously
(at time
. * of study end) or at time of death
. replace tte_730_strata = tte_730_cross if tte_730_strata == .
(630,819 real changes made)

.
. * code the mortality variable from the crossover version above
. gen died_730_strata = died_730_cross

.
. * modify mortality variable to account for censoring at infection
crossover
. replace died_730_strata = 0 if indextodeath_caseindex>tte_730_strata &
!missing(indextodeath_caseindex)
(11,552 real changes made)

.
. * drop variables we no longer need
. drop mkg_tte_730_strata

.
. * PP2 - mortality and excess mortality among cases
. tab died_730_strata infected, co chi // (Abstract & Results)

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

died_730_s |       infected
     trata |         0          1 |     Total
-----------+----------------------+----------
         0 |   995,024    189,933 | 1,184,957
           |     95.91      91.29 |     95.14
-----------+----------------------+----------
         1 |    42,399     18,128 |    60,527
           |      4.09       8.71 |      4.86
-----------+----------------------+----------
     Total | 1,037,423    208,061 | 1,245,484
           |    100.00     100.00 |    100.00

          Pearson chi2(1) =  8.0e+03   Pr = 0.000

.
```

```
. di 42399/1037423 //4.09 mortality rate of comparators (Abstract &
Results)
.04086954

. di 208061*0.04086954 //mortality rate of comparators applied to cases
= 8503 deaths
8503.3574

. di 18128-8503.3574 //9625 excess deaths
9624.6426

.
. *----------------------------
. * PP2 Kaplan Meier Curves
. *----------------------------
.
. ** Creating Variables for KM **
.
. * alive on index day, censored at 90 days
. gen tte_0_90_strata = ttstudyend

. replace tte_0_90_strata = 90 if ttstudyend>90
(1,245,484 real changes made)

. replace tte_0_90_strata = indextodeath_caseindex  ///
>                                         if indextodeath_caseindex
indextodeath_caseindex<90
(23,659 real changes made)

. replace tte_0_90_strata = tte_730_strata if tte_730_strata<=90
(94,745 real changes made)

.
. * alive on Day 91, censored at 180 days
. gen tte_91_180_strata = ttstudyend

. replace tte_91_180_strata = 180 if ttstudyend>180
(1,245,484 real changes made)

. replace tte_91_180_strata = indextodeath_caseindex if   ///
>                                                   indextodeath_caseindex
inrange(indextodeath_caseindex, 91, 180)
(12,195 real changes made)

. replace tte_91_180_strata = tte_730_strata if inrange(tte_730_strata,
91, 180)
(66,788 real changes made)

. replace tte_91_180_strata = . if alive_day91==0
(23,814 real changes made, 23,814 to missing)

.
. * alive on Day 181, censored at 365 days
. gen tte_181_365_strata = ttstudyend
```

```
. replace tte_181_365_strata = 365 if ttstudyend>365
(1,191,419 real changes made)

. replace tte_181_365_strata = indextodeath_caseindex if  ///
>                                                 indextodeath_caseindex
inrange(indextodeath_caseindex, 181, 365)
(25,921 real changes made)

. replace tte_181_365_strata = tte_730_strata if inrange(tte_730_strata,
181, 365)
(196,086 real changes made)

. replace tte_181_365_strata = . if alive_day181==0
(36,173 real changes made, 36,173 to missing)


.
. * alive on Day 366, censored at 730 days
. gen tte_366_730_strata = ttstudyend

. replace tte_366_730_strata = 730 if ttstudyend>730
(13,998 real changes made)

. replace tte_366_730_strata = indextodeath_caseindex if  ///
>                                                 indextodeath_caseindex
inrange(indextodeath_caseindex, 366, 730)
(20,049 real changes made)

. replace tte_366_730_strata = tte_730_strata if inrange(tte_730_strata,
366, 730)
(164,239 real changes made)

. replace tte_366_730_strata = . if alive_day366==0
(114,374 real changes made, 114,374 to missing)


.
.
. ** Figure 1: KM Curves **
.
. * 0-90 Days
. preserve

.         recode tte_0_90_strata (0=0.5)
(377 changes made to tte_0_90_strata)

.         stset tte_0_90_strata , failure(died_0_90_stratacrossover==1)

Survival-time data settings

         Failure event: died_0_90_stratacrossover==1
Observed time interval: (0, tte_0_90_strata]
     Exit on or before: failure

-------------------------------------------------------------------------
```

```
--
  1,245,484  total observations
          0  exclusions
------------------------------------------------------------------------------
--
  1,245,484  observations remaining, representing
     22,129  failures in single-record/single-failure data
  106542617  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
90

.         *sts test infected, logrank
.         sts graph, by(infected) name(survival090, replace)      ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                 size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
0-90", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))  ///
>                 tlabel(, labsize(small)) ylabel(, labsize(small))

        Failure _d: died_0_90_stratacrossover==1
  Analysis time _t: tte_0_90_strata

.         *graph save "survival090" "Figures\survival090.gph", replace
. restore

.
. * 91-180 Days
. preserve

.         stset tte_91_180_strata ,
failure(died_91_180_stratacrossover==1)

Survival-time data settings

         Failure event: died_91_180_stratacrossover==1
Observed time interval: (0, tte_91_180_strata]
     Exit on or before: failure

------------------------------------------------------------------------------
--
  1,245,484  total observations
     23,814  event time missing (tte_91_180_strata>=.)      PROBABLE
ERROR
------------------------------------------------------------------------------
--
  1,221,670  observations remaining, representing
```

```
      9,986  failures in single-record/single-failure data
  216380896  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
180

.         *sts test infected, logrank
.         sts graph, by(infected) name(survival91180, replace)  ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                   size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
91-180", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))   ///
>                 ylabel(0.9 (0.02) 1.0, labsize(small)) ///
>                 tmin(91) tlabel(90 (20) 190, labsize(small))

        Failure _d: died_91_180_stratacrossover==1
  Analysis time _t: tte_91_180_strata

.         *graph save "survival91180" "Figures\survival91180.gph",
replace
. restore

.
. * 181-365 Days
. preserve

.         stset tte_181_365_strata ,
failure(died_181_365_stratacrossover==1)

Survival-time data settings

         Failure event: died_181_365_stratacrossover==1
Observed time interval: (0, tte_181_365_strata]
     Exit on or before: failure

------------------------------------------------------------------------
--
  1,245,484  total observations
     36,173  event time missing (tte_181_365_strata>=.)     PROBABLE
ERROR
------------------------------------------------------------------------
--
  1,209,311  observations remaining, representing
     18,049  failures in single-record/single-failure data
  422019742  total analysis time at risk and under observation
                                                At risk from t =
0
```

```
                                        Earliest observed entry t =
0
                                             Last observed exit t =
365

.         *sts test infected, logrank
.         tab _d infected, co chi // (Results: 1.37% (1.4) vs 1.51%
(1.5))

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

      1 if |
failure; 0 |
        if |       infected
  censored |         0          1 |     Total
-----------+----------------------+----------
         0 | 1,000,322    190,940 | 1,191,262
           |     98.49      98.63 |     98.51
-----------+----------------------+----------
         1 |    15,387      2,662 |    18,049
           |      1.51       1.37 |      1.49
-----------+----------------------+----------
     Total | 1,015,709    193,602 | 1,209,311
           |    100.00     100.00 |    100.00

          Pearson chi2(1) =  21.6519   Pr = 0.000

.         sts graph, by(infected) name(survival181365, replace) ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                 size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
181-365", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))   ///
>                 ylabel(0.9 (0.02) 1.0, labsize(small)) ///
>                 tmin(181) tlabel(180 (40) 380, labsize(small))

        Failure _d: died_181_365_stratacrossover==1
  Analysis time _t: tte_181_365_strata

.         *graph save "survival181365" "Figures\survival181365.gph",
replace
. restore

.
. * 366-730 Days
. preserve
```

```
.         stset tte_366_730_strata ,
failure(died_366_730_stratacrossover==1)

Survival-time data settings

         Failure event: died_366_730_stratacrossover==1
Observed time interval: (0, tte_366_730_strata]
     Exit on or before: failure

------------------------------------------------------------------------
--
  1,245,484  total observations
    114,374  event time missing (tte_366_730_strata>=.)     PROBABLE
ERROR
------------------------------------------------------------------------
--
  1,131,110  observations remaining, representing
     10,364  failures in single-record/single-failure data
  555436295  total analysis time at risk and under observation
                                                 At risk from t =
0
                                      Earliest observed entry t =
0
                                           Last observed exit t =
730

.         *sts test infected, logrank
.         tab _d infected, co chi // (Results: 0.81% (0.8) vs 0.94%
(0.9))

+--------------------+
| Key                |
|--------------------|
|     frequency      |
| column percentage  |
+--------------------+

      1 if |
failure; 0 |
        if |       infected
  censored |         0          1 |     Total
-----------+----------------------+----------
         0 |   940,563    180,183 | 1,120,746
           |     99.06      99.19 |     99.08
-----------+----------------------+----------
         1 |     8,890      1,474 |    10,364
           |      0.94       0.81 |      0.92
-----------+----------------------+----------
     Total |   949,453    181,657 | 1,131,110
           |    100.00     100.00 |    100.00

          Pearson chi2(1) =  26.2051   Pr = 0.000
```

```
.         sts graph, by(infected) name(survival366730, replace)  ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                   size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
366-730", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))   ///
>                 ylabel(0.9 (0.02) 1.0, labsize(small)) ///
>                 tmin(366) tlabel(365 450 550 650 730, labsize(small))

        Failure _d: died_366_730_stratacrossover==1
  Analysis time _t: tte_366_730_strata

.         *graph save "survival366730" "Figures\survival366730.gph",
replace
. restore

.
. * 0-730 Days
. preserve

.         recode tte_730_strata (0=0.5)
(377 changes made to tte_730_strata)

.         stset tte_730_strata , failure(died_730_strata)

Survival-time data settings

         Failure event: died_730_strata!=0 & died_730_strata<.
Observed time interval: (0, tte_730_strata]
     Exit on or before: failure

------------------------------------------------------------------------
--
  1,245,484  total observations
          0  exclusions
------------------------------------------------------------------------
--
  1,245,484  observations remaining, representing
     60,527  failures in single-record/single-failure data
  477586587  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
730

.         stdescribe

        Failure _d: died_730_strata
  Analysis time _t: tte_730_strata
```

```
                                  |-------------- Per subject ---------
-----|
Category                    Total        Mean         Min     Median
Max
-------------------------------------------------------------------------
------
Number of subjects        1245484
Number of records         1245484           1           1           1
1

Entry time (first)                          0           0           0
0
Exit time (final)                    383.4546          .5         423
730

Subjects with gap                0
Time on gap                      0
Time at risk             4.776e+08    383.4546          .5         423
730

Failures                     60527    .0485972           0           0
1
-------------------------------------------------------------------------
------

.         stdescribe if infected==1

        Failure _d: died_730_strata
  Analysis time _t: tte_730_strata

                                  |-------------- Per subject ---------
-----|
Category                    Total        Mean         Min     Median
Max
-------------------------------------------------------------------------
------
Number of subjects         208061
Number of records          208061           1           1           1
1

Entry time (first)                          0           0           0
0
Exit time (final)                    368.0602          .5         417
730

Subjects with gap                0
Time on gap                      0
Time at risk             76578980    368.0602          .5         417
730

Failures                     18128    .0871283           0           0
1
-------------------------------------------------------------------------
```

```
------

.         stdescribe if infected==0

        Failure _d: died_730_strata
  Analysis time _t: tte_730_strata

                                    |-------------- Per subject ---------
-----|
Category                    Total        Mean         Min     Median
Max
------------------------------------------------------------------------
------
Number of subjects        1037423
Number of records         1037423           1           1           1
1

Entry time (first)                          0           0           0
0
Exit time (final)                     386.542          .5         424
730

Subjects with gap               0
Time on gap                     0
Time at risk            4.010e+08     386.542          .5         424
730

Failures                    42399    .0408695           0           0
1
------------------------------------------------------------------------
------

.         *sts test infected, logrank
.         sts graph, by(infected) name(survival0730, replace) ///
>                 legend(pos(5) ring(0) rows(2) region(lcolor(none)) ///
>                                 size(small) label(1 "Comparators")
label(2 "COVID-19 Cases"))    ///
>                 graphregion(color(white)) bgcolor(white) title("Days
0-730", color(black) size(medium)) ///
>                 xtitle("") ///
>                 plot1opts(lpattern(solid) lcolor("0 114 178")) ///
>                 plot2opts(lpattern(dash) lcolor("230 159 0"))   ///
>                 tlabel(, labsize(small)) ylabel(, labsize(small))

        Failure _d: died_730_strata
  Analysis time _t: tte_730_strata

.         *graph save "survival0730" "Figures\survival0730.gph", replace
. restore

.
.
. *-------------------------------------
. * Table 2: PP-Unweighted Cox Models
```

```
. *-------------------------------------
.
. * Overall
.
. preserve

.
.         stset tte_730_strata, failure(died_730_strata) id(uniq_patid)

Survival-time data settings

           ID variable: uniq_patid
         Failure event: died_730_strata!=0 & died_730_strata<.
Observed time interval: (tte_730_strata[_n-1], tte_730_strata]
     Exit on or before: failure

--------------------------------------------------------------------------
--
  1,245,484  total observations
        377  observations end on or before enter()
--------------------------------------------------------------------------
--
  1,245,107  observations remaining, representing
  1,245,107  subjects
     60,186  failures in single-failure-per-subject data
  477586398  total analysis time at risk and under observation
                                                At risk from t =
0
                                     Earliest observed entry t =
0
                                          Last observed exit t =
730

.         stcox infected, efron vce(cluster patienticn)
strata(matchgroupnumber)

        Failure _d: died_730_strata
  Analysis time _t: tte_730_strata
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -105656.04
Iteration 1:   log pseudolikelihood = -102322.95
Iteration 2:   log pseudolikelihood = -102012.93
Iteration 3:   log pseudolikelihood = -102012.62
Refining estimates:
Iteration 0:   log pseudolikelihood = -102012.62

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects = 1,245,107                         Number of obs =
1,245,107
No. of failures =    60,186
Time at risk    = 477586398
```

```
                                                  Wald chi2(1)  =
9220.08
Log pseudolikelihood = -102012.62                 Prob > chi2   =
0.0000

                     (Std. err. adjusted for 1,091,916 clusters in
patienticn)
------------------------------------------------------------------------------
             |               Robust
          _t | Haz. ratio   std. err.      z    P>|z|     [95% conf.
interval]
-------------+----------------------------------------------------------------
    infected |   2.270487   .0193893    96.02   0.000       2.2328
2.308809
------------------------------------------------------------------------------

.
. restore

.
.
. * By period
.
. preserve

.
.         * stset dataset with new censoring and failure variables
.         stset tte_730_strata, failure(died_730_strata) id(uniq_patid)

Survival-time data settings

           ID variable: uniq_patid
         Failure event: died_730_strata!=0 & died_730_strata<.
Observed time interval: (tte_730_strata[_n-1], tte_730_strata]
     Exit on or before: failure

--------------------------------------------------------------------------
--
  1,245,484  total observations
        377  observations end on or before enter()
--------------------------------------------------------------------------
--
  1,245,107  observations remaining, representing
  1,245,107  subjects
     60,186  failures in single-failure-per-subject data
  477586398  total analysis time at risk and under observation
                                                  At risk from t =
0
                                       Earliest observed entry t =
0
                                            Last observed exit t =
```

```
730

.         stsplit period, at(0 90 180 365 730)
(2,978,471 observations (episodes) created)

.
.         * create new interaction variables after splitting data
.         gen timeinfected_0_90 = infected * (tte_730_strata<=90)

.         gen timeinfected_91_180 = infected * (tte_730_strata>90 &
tte_730_strata<=180)

.         gen timeinfected_181_365 = infected * (tte_730_strata>180 &
tte_730_strata<=365)

.         gen timeinfected_366_730 = infected * (tte_730_strata>365 &
tte_730_strata<=730)

.
.         *-----------------------
.         * Main Model - Unadj.
.         *-----------------------
.
.         stcox   timeinfected_0_90 timeinfected_91_180
timeinfected_181_365  ///
>                         timeinfected_366_730
///
>                         , efron vce(cluster patienticn)
strata(matchgroupnumber)

        Failure _d: died_730_strata
  Analysis time _t: tte_730_strata
       ID variable: uniq_patid

Iteration 0:   log pseudolikelihood = -105656.04
Iteration 1:   log pseudolikelihood = -99350.316
Iteration 2:   log pseudolikelihood = -97168.116
Iteration 3:   log pseudolikelihood = -97023.527
Iteration 4:   log pseudolikelihood = -97023.522
Refining estimates:
Iteration 0:   log pseudolikelihood = -97023.522

Stratified Cox regression with Efron method for ties
Strata variable: matchgroupnumber

No. of subjects = 1,245,107                         Number of obs =
4,223,578
No. of failures =    60,186
Time at risk    = 477586398
                                                    Wald chi2(4)  =
22888.39
Log pseudolikelihood = -97023.522                   Prob > chi2   =
0.0000
```

```
                              (Std. err. adjusted for 1,091,916 clusters
in patienticn)
------------------------------------------------------------------------
--------------
                     |               Robust
                  _t | Haz. ratio   std. err.      z    P>|z|     [95%
conf. interval]
---------------------+--------------------------------------------------
--------------
   timeinfected_0_90 |   6.472236   .0799848   151.12   0.000
6.317352    6.630917
 timeinfected_91_180 |   1.164641   .0279073     6.36   0.000
1.111209    1.220643
timeinfected_181_365 |   .9202852   .0187548    -4.08   0.000
.8842509    .9577879
timeinfected_366_730 |   .8847994   .0234548    -4.62   0.000
.8400027     .931985
------------------------------------------------------------------------
--------------

.
. restore

.
.
. log close
      name:
       log:  ...\LTO Mortality\Logs\analysis_lto_mortality_20230605.log
  log type:  text
 closed on:   5 Jun 2023, 16:24:17
------------------------------------------------------------------------
------------------------------------------------------------------------
-----------------------------------------------
```