

**Title:** Causes and timing of 30-day rehospitalization from skilled nursing facilities after a hospital admission for pneumonia or sepsis.

**Authors:** Melissa R Riester, PharmD, Elliott Bosco, PharmD, PhD, Joe B B Silva, ScM, Barbara H Bardenheier, PhD, Parag Goyal, MD, MSc, Emily O'Neil, PharmD, Robertus van Aalst, PhD, MSc, Ayman Chit, PhD, Stefan Gravenstein, MD, MPH, Andrew R Zullo, PharmD, PhD

**Journal:** PLOS ONE

**Software used for analyses:** SAS version 9.4

**Funding:** This study was funded by a grant from Sanofi Pasteur paid directly to Brown University.

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/* Subdistribution hazard regression modelling and graphs */
/* Code for final readmissions tables-Pneumonia and Sepsis */

data cen;
set mylibnew.Paccohrt_ltcfrisk1207;
run;

proc freq data=cen;
tables indexhosp_infec indexhosp_circ indexhosp_renal indexhosp_resp;
run;
/* Limiting follow up time to 30days */
data cen1;
set cen;
follup_end_new1=index_hidisch+29;
run;
proc print data=cen1 (obs=100);
var index_hidisch follup_end_new1;
run;
proc contents data=cen1 varnum;
run;

data cen2;
set cen1;
format index_hidisch date9. follup_end_new1 date9.;
run;

proc print data=cen2 (obs=100);
var index_hidisch follup_end_new1 hkdod pta_end ptb_end rehosp_hiadmdt
windowend;
run;
/* included the epi_thru in calculating mindate */
data cen3;
set cen2;
mindatewdc_new1 = min(epi_thru, hkdod, follup_end_new1, pta_end, ptb_end,
rehosp_hiadmdt);
format mindatewdc_new1 date9.;
run;
```

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proc contents data=cen3 varnum;
run;
/* coding the new outcome variables for subdistribution hazard regression
modelling */
data cen3;
set cen3;
if re hosp=0 AND follup_end_new1=min datewdc_new1 then ccs1 hosp1=0;
    else if re hosp_ccs_cat=1 AND re hosp_planned=0 AND
re hosp_hiadmdt=min datewdc_new1 then ccs1 hosp1=1;
    else if hkdod=min datewdc_new1 OR (re hosp_ccs_cat NE 1 AND
re hosp_planned=0 AND re hosp_hiadmdt=min datewdc_new1) then ccs1 hosp1=2;
    else ccs1 hosp1=3;

    if re hosp=0 AND follup_end_new1=min datewdc_new1 then ccs2 hosp1=0;
    else if re hosp_ccs_cat=2 AND re hosp_planned=0 AND
re hosp_hiadmdt=min datewdc_new1 then ccs2 hosp1=1;
    else if hkdod=min datewdc_new1 OR (re hosp_ccs_cat NE 2 AND
re hosp_planned=0 AND re hosp_hiadmdt=min datewdc_new1) then ccs2 hosp1=2;
    else ccs2 hosp1=3;

    if re hosp=0 AND follup_end_new1=min datewdc_new1 then ccs3 hosp1=0;
    else if re hosp_ccs_cat=3 AND re hosp_planned=0 AND
re hosp_hiadmdt=min datewdc_new1 then ccs3 hosp1=1;
    else if hkdod=min datewdc_new1 OR (re hosp_ccs_cat NE 3 AND
re hosp_planned=0 AND re hosp_hiadmdt=min datewdc_new1) then ccs3 hosp1=2;
    else ccs3 hosp1=3;

    if re hosp=0 AND follup_end_new1=min datewdc_new1 then ccs4 hosp1=0;
    else if re hosp_ccs_cat=4 AND re hosp_planned=0 AND
re hosp_hiadmdt=min datewdc_new1 then ccs4 hosp1=1;
    else if hkdod=min datewdc_new1 OR (re hosp_ccs_cat NE 4 AND
re hosp_planned=0 AND re hosp_hiadmdt=min datewdc_new1) then ccs4 hosp1=2;
    else ccs4 hosp1=3;

    if re hosp=0 AND follup_end_new1=min datewdc_new1 then ccs5 hosp1=0;
    else if re hosp_ccs_cat=5 AND re hosp_planned=0 AND
re hosp_hiadmdt=min datewdc_new1 then ccs5 hosp1=1;
    else if hkdod=min datewdc_new1 OR (re hosp_ccs_cat NE 5 AND
re hosp_planned=0 AND re hosp_hiadmdt=min datewdc_new1) then ccs5 hosp1=2;
    else ccs5 hosp1=3;

    if re hosp=0 AND follup_end_new1=min datewdc_new1 then ccs6 hosp1=0;
    else if re hosp_ccs_cat=6 AND re hosp_planned=0 AND
re hosp_hiadmdt=min datewdc_new1 then ccs6 hosp1=1;
    else if hkdod=min datewdc_new1 OR (re hosp_ccs_cat NE 6 AND
re hosp_planned=0 AND re hosp_hiadmdt=min datewdc_new1) then ccs6 hosp1=2;
    else ccs6 hosp1=3;

    if re hosp=0 AND follup_end_new1=min datewdc_new1 then ccs7 hosp1=0;
    else if re hosp_ccs_cat=7 AND re hosp_planned=0 AND
re hosp_hiadmdt=min datewdc_new1 then ccs7 hosp1=1;
    else if hkdod=min datewdc_new1 OR (re hosp_ccs_cat NE 7 AND
re hosp_planned=0 AND re hosp_hiadmdt=min datewdc_new1) then ccs7 hosp1=2;
    else ccs7 hosp1=3;

    if re hosp=0 AND follup_end_new1=min datewdc_new1 then ccs8 hosp1=0;

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    else if re hosp_ccs_cat=8 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs8hosp1=1;
    else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 8 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs8hosp1=2;
    else ccs8hosp1=3;

    if re hosp=0 AND follup_end_new1=m indatew dc_new1 then ccs9hosp1=0;
    else if re hosp_ccs_cat=9 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs9hosp1=1;
    else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 9 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs9hosp1=2;
    else ccs9hosp1=3;

    if re hosp=0 AND follup_end_new1=m indatew dc_new1 then ccs10hosp1=0;
    else if re hosp_ccs_cat=10 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs10hosp1=1;
    else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 10 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs10hosp1=2;
    else ccs10hosp1=3;

    if re hosp=0 AND follup_end_new1=m indatew dc_new1 then ccs11hosp1=0;
    else if re hosp_ccs_cat=11 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs11hosp1=1;
    else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 11 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs11hosp1=2;
    else ccs11hosp1=3;

    if re hosp=0 AND follup_end_new1=m indatew dc_new1 then ccs12hosp1=0;
    else if re hosp_ccs_cat=12 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs12hosp1=1;
    else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 12 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs12hosp1=2;
    else ccs12hosp1=3;

    if re hosp=0 AND follup_end_new1=m indatew dc_new1 then ccs13hosp1=0;
    else if re hosp_ccs_cat=13 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs13hosp1=1;
    else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 13 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs13hosp1=2;
    else ccs13hosp1=3;

    if re hosp=0 AND follup_end_new1=m indatew dc_new1 then ccs14hosp1=0;
    else if re hosp_ccs_cat=14 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs14hosp1=1;
    else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 14 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs14hosp1=2;
    else ccs14hosp1=3;

    if re hosp=0 AND follup_end_new1=m indatew dc_new1 then ccs15hosp1=0;
    else if re hosp_ccs_cat=15 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs15hosp1=1;
    else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 15 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs15hosp1=2;
    else ccs15hosp1=3;

    if re hosp=0 AND follup_end_new1=m indatew dc_new1 then ccs16hosp1=0;

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        else if re hosp_ccs_cat=16 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs16 hosp1=1;
        else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 16 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs16 hosp1=2;
        else ccs16 hosp1=3;

        if re hosp=0 AND follup_end_new1=m indatew dc_new1 then ccs17 hosp1=0;
        else if re hosp_ccs_cat=17 AND re hosp_planned=0 AND
re hosp_hiadm dt=m indatew dc_new1 then ccs17 hosp1=1;
        else if hkdod=m indatew dc_new1 OR (re hosp_ccs_cat NE 17 AND
re hosp_planned=0 AND re hosp_hiadm dt=m indatew dc_new1) then ccs17 hosp1=2;
        else ccs17 hosp1=3;

format m indatew dc_new1 follup_end_new1 windowend date9.;

run;
/* follow up time 30 days */
data cen4;
set cen3;
T1=m indatew dc_new1-index_hidisch;
run;
proc print data=cen4;
var T1;
where T1>30;
run;
proc print data=cen4;
var T1;
where T1<0;
run;
data cen5;
set cen4;
if T1<0 then delete;
run;
/* Final Dataset used for Subdistribution Hazard modelling and for the
tables is "Pacchohort_ltcfrisk_30d" */

data mm.Pacchohort_ltcfrisk_30d;
set cen5;
run;

data cen3;
set mm.Pacchohort_ltcfrisk_30d;
run;
proc contents data=mm.Pacchohort_ltcfrisk_30d varnum;
run;
proc format;
value yn 1="yes"
0="No";
run;
data mm.cohort12_13n;
set cen3;
keep cohort index_sepsis index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat
comorbidscorecat m3_CFScat ccs1hosp1 T1 ccs1hosp1 ccs2hosp1 ccs3hosp1
ccs4hosp1 ccs5hosp1 ccs6hosp1

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ccs7hosp1 ccs8hosp1 ccs9hosp1 ccs10hosp1 ccs11hosp1 ccs12hosp1 ccs13hosp1
ccs14hosp1 ccs15hosp1 ccs16hosp1 ccs17hosp1;
if cohort="2012_2013" then output;
run;
data mm.cohort13_14n;
set cen3;
keep cohort index_sepsis index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat
comorbidscorecat m3_CFScat ccs1hosp1 T1 ccs1hosp1 ccs2hosp1 ccs3hosp1
ccs4hosp1 ccs5hosp1 ccs6hosp1
ccs7hosp1 ccs8hosp1 ccs9hosp1 ccs10hosp1 ccs11hosp1 ccs12hosp1 ccs13hosp1
ccs14hosp1 ccs15hosp1 ccs16hosp1 ccs17hosp1;
if cohort="2013_2014" then output;
run;
data mm.cohort14_15n;
set cen3;
keep cohort index_sepsis index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat
comorbidscorecat m3_CFScat ccs1hosp1 T1 ccs1hosp1 ccs2hosp1 ccs3hosp1
ccs4hosp1 ccs5hosp1 ccs6hosp1
ccs7hosp1 ccs8hosp1 ccs9hosp1 ccs10hosp1 ccs11hosp1 ccs12hosp1 ccs13hosp1
ccs14hosp1 ccs15hosp1 ccs16hosp1 ccs17hosp1;
if cohort="2014_2015" then output;
run;

/*Create datasets with covariates for CIF output */
data pi;
index_pandi=1;
output;
run;

data sepsis;
index_sepsis=1;
output;
run;

/* PNEUMONIA */
*Season: 2012-13;
* Subdistribution Hazard model for "index_pandi vs different rehosps";
proc phreg data=mm.cohort12_13n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs1hosp1(0,3) = index_pandi age_at_index hksex
hkrace1 frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi1_1213n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs infectious rehosp" ;
run;
proc phreg data=mm.cohort12_13n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')

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m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs7hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi2_1213n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs circulatory rehosp" ;
run;
proc phreg data=mm.cohort12_13n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs8hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi3_1213n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs respiratory rehosp" ;
run;
proc phreg data=mm.cohort12_13n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs10hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi4_1213n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs renal rehosp" ;
run;
/* extracting the daily risk from the CIF */
data pi1_13n;
set mm.pandi1_1213n;
Risk_infec=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi1_13n out=p13_s1;
by descending risk_infec ;
run;
/* extracting the daily risk from the CIF */
data pi2_13n;
set mm.pandi2_1213n;
Risk_circ=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */

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```

proc sort data=pi2_13n out=p13_s2;
by descending risk_circ ;
run;
/* extracting the daily risk from the CIF */
data pi3_13n;
set mm.pandi3_1213n;
Risk_Resp=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi3_13n out=p13_s3;
by descending risk_Resp ;
run;
/* extracting the daily risk from the CIF */
data pi4_13n;
set mm.pandi4_1213n;
Risk_renal=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi4_13n out=p13_s4;
by descending risk_renal ;
run;
/* merging all the risk datasets for creating a graph in next step */
data mm.merge_pandi1213n;
merge pi1_13n pi2_13n pi3_13n pi4_13n;
run;

*Season 2013-14;

* Subdistribution Hazard model for "index_pandi vs different rehospns";
proc phreg data=mm.cohort13_14n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidcorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs1hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidcorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi1_1314n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs infectious rehosp" ;
run;
proc phreg data=mm.cohort13_14n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidcorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs7hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidcorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;

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baseline out=mm.pandi2_1314n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs circulatory rehosp" ;
run;
proc phreg data=mm.cohort13_14n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidcorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs8hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidcorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi3_1314n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs respiratory rehosp" ;
run;
proc phreg data=mm.cohort13_14n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidcorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs10hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidcorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi4_1314n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs renal rehosp" ;
run;
/* extracting the daily risk from the CIF */
data pi1_14n;
set mm.pandi1_1314n;
Risk_infec=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi1_14n out=p14_s1;
by descending risk_infec ;
run;
/* extracting the daily risk from the CIF */
data pi2_14n;
set mm.pandi2_1314n;
Risk_circ=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi2_14n out=p14_s2;
by descending risk_circ ;
run;
/* extracting the daily risk from the CIF */
data pi3_14n;
set mm.pandi3_1314n;
Risk_Resp=dif(CIF);
run;

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```

/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi3_14n out=p14_s3;
by descending risk_Resp ;
run;
/* extracting the daily risk from the CIF */
data pi4_14n;
set mm.pandi4_1314n;
Risk_renal=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi4_14n out=p14_s4;
by descending risk_Renal ;
run;
/* merging all the risk datasets for creating a graph in next step */
data mm.merge_pandi1314n;
merge pi1_14n pi2_14n pi3_14n pi4_14n;
run;

*Season 2014-15;

* Subdistribution Hazard model for "index_pandi vs different rehosps";
proc phreg data=mm.cohort14_15n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs1hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi1_1415n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs infectious rehosp" ;
run;
proc phreg data=mm.cohort14_15n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs7hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi2_1415n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs circulatory rehosp" ;
run;
proc phreg data=mm.cohort14_15n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')

```

```

comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs8hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi3_1415n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs respiratory rehosp" ;
run;
proc phreg data=mm.cohort14_15n covsandwich plots(overlay)=cif;
class index_pandi(ref='yes') hksex(ref='1') hkrace1(ref='White non-Hispanic')
frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs10hosp1(0,3) = index_pandi age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_pandi / diff=pairwise;
baseline out=mm.pandi4_1415n cif=_all_/rowid=index_pandi;
format index_pandi yn.;
title "index_pandi vs renal rehosp" ;
run;
/* extracting the daily risk from the CIF */
data pi1_15n;
set mm.pandi1_1415n;
Risk_infec=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi1_15n out=p15_s1;
by descending risk_infec ;
run;
/* extracting the daily risk from the CIF */
data pi2_15n;
set mm.pandi2_1415n;
Risk_circ=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi2_15n out=p15_s2;
by descending risk_circ ;
run;
/* extracting the daily risk from the CIF */
data pi3_15n;
set mm.pandi3_1415n;
Risk_Resp=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi3_15n out=p15_s3;
by descending risk_Resp ;
run;
/* extracting the daily risk from the CIF */
data pi4_15n;
set mm.pandi4_1415n;
Risk_renal=dif(CIF);
run;

```

```

/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=pi4_15n out=p15_s4;
by descending risk_renal ;
run;
/* merging all the risk datasets for creating a graph in next step */
data mm.merge_pandi1415n;
merge pi1_15n pi2_15n pi3_15n pi4_15n;
run;

/* SEPSIS */
*Season 2012-13;
* Subdistribution Hazard model for "index_sepsis vs different rehosps";
proc phreg data=mm.cohort12_13n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs1hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis1_1213n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs infectious rehosp" ;
run;
proc phreg data=mm.cohort12_13n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs7hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis2_1213n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs circulatory rehosp" ;
run;
proc phreg data=mm.cohort12_13n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs8hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis3_1213n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;

```

```

title "index_sepsis vs respiratory rehosp" ;
run;
proc phreg data=mm.cohort12_13n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidcorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs10hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidcorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis4_1213n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs renal rehosp" ;
run;
/* extracting the daily risk from the CIF */
data sepsis1_13n;
set mm.sepsis1_1213n;
Risk_infec=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis1_13n out=sepsis13_s1;
by descending risk_infec ;
run;
/* extracting the daily risk from the CIF */
data sepsis2_13n;
set mm.sepsis2_1213n;
Risk_circ=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis2_13n out=sepsis13_s2;
by descending risk_circ ;
run;
/* extracting the daily risk from the CIF */
data sepsis3_13n;
set mm.sepsis3_1213n;
Risk_Resp=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis3_13n out=sepsis13_s3;
by descending risk_Resp ;
run;
/* extracting the daily risk from the CIF */
data sepsis4_13n;
set mm.sepsis4_1213n;
Risk_renal=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis4_13n out=sepsis13_s4;
by descending risk_renal ;
run;
/* merging all the risk datasets for creating a graph in next step */
data mm.merge_sepsis1213n;
merge sepsis1_13n sepsis2_13n sepsis3_13n sepsis4_13n;
run;

```

```

*Season 2013-14;

* Subdistribution Hazard model for "index_SEPSIS vs different rehosps";
proc phreg data=mm.cohort13_14n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidcorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs1hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidcorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis1_1314n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs infectious rehosps" ;
run;
proc phreg data=mm.cohort13_14n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidcorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs7hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidcorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis2_1314n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs circulatory rehosps" ;
run;
proc phreg data=mm.cohort13_14n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidcorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs8hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidcorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis3_1314n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs respiratory rehosps" ;
run;
proc phreg data=mm.cohort13_14n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidcorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;

```

```

model T1*ccs10hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis4_1314n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs renal rehosp" ;
run;
/* extracting the daily risk from the CIF */
data sepsis1_14n;
set mm.sepsis1_1314n;
Risk_infec=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis1_14n out=sepsis14_s1;
by descending risk_infec ;
run;
/* extracting the daily risk from the CIF */
data sepsis2_14n;
set mm.sepsis2_1314n;
Risk_circ=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis2_14n out=sepsis14_s2;
by descending risk_circ ;
run;
/* extracting the daily risk from the CIF */
data sepsis3_14n;
set mm.sepsis3_1314n;
Risk_Resp=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis3_14n out=sepsis14_s3;
by descending risk_Resp ;
run;
/* extracting the daily risk from the CIF */
data sepsis4_14n;
set mm.sepsis4_1314n;
Risk_renal=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis4_14n out=sepsis14_s4;
by descending risk_renal ;
run;
/* merging all the risk datasets for creating a graph in next step */
data mm.merge_sepsis1314n;
merge sepsis1_14n sepsis2_14n sepsis3_14n sepsis4_14n;
run;

* Season 2014-15;

* Subdistribution Hazard model for "index_sepsis vs different rehosp";
proc phreg data=mm.cohort14_15n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')

```

```

m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs1hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis1_1415n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs infectious re hosp" ;
run;
proc phreg data=mm.cohort14_15n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs7hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis2_1415n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs circulatory re hosp" ;
run;
proc phreg data=mm.cohort14_15n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs8hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis3_1415n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs respiratory re hosp" ;
run;
proc phreg data=mm.cohort14_15n covsandwich plots(overlay)=cif;
class index_sepsis(ref='yes') hksex(ref='1') hkrace1(ref='White non-
Hispanic') frailtyindexcat(ref='Robust')
m3_adlcat(ref='independent to limited assistance required')
m3_chesscat(ref='no instability')
comorbidscorecat(ref='lt zero') m3_CFScat(ref='cognitively intact') /
param=glm order=internal ref=FIRST;
model T1*ccs10hosp1(0,3) = index_sepsis age_at_index hksex hkrace1
frailtyindexcat m3_adlcat m3_chesscat comorbidscorecat m3_CFScat /
eventcode=1;
Hazardratio 'Pairwise' index_sepsis / diff=pairwise;
baseline out=mm.sepsis4_1415n cif=_all_/rowid=index_sepsis;
format index_sepsis yn.;
title "index_sepsis vs renal re hosp" ;
run;

```

```

/* extracting the daily risk from the CIF */
data sepsis1_15n;
set mm.sepsis1_1415n;
Risk_infec=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis1_15n out=sepsis15_s1;
by descending risk_infec ;
run;
/* extracting the daily risk from the CIF */
data sepsis2_15n;
set mm.sepsis2_1415n;
Risk_circ=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis2_15n out=sepsis15_s2;
by descending risk_circ ;
run;
/* extracting the daily risk from the CIF */
data sepsis3_15n;
set mm.sepsis3_1415n;
Risk_Resp=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis3_15n out=sepsis15_s3;
by descending risk_Resp ;
run;
/* extracting the daily risk from the CIF */
data sepsis4_15n;
set mm.sepsis4_1415n;
Risk_renal=dif(CIF);
run;
/* sorting the daily risk to get the day with the highest risk (Table 4) */
proc sort data=sepsis4_15n out=sepsis15_s4;
by descending risk_renal ;
run;
/* merging all the risk datasets for creating a graph in next step */
data mm.merge_sepsis1415n;
merge sepsis1_15n sepsis2_15n sepsis3_15n sepsis4_15n;
run;

/* Trajectory Plots */

/* Figure 1A */
PROC SGPLOT DATA = mm.merge_pandi1213n;
SERIES X = T1 Y = Risk_infec / LEGENDLABEL = 'Infectious'
MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_circ / LEGENDLABEL = 'Circulatory'
MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y = Risk_Resp / LEGENDLABEL = 'Respiratory'
MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_renal / LEGENDLABEL = 'Genitourinary'
MARKERS LINEATTRS = (THICKNESS = 2);
XAXIS LABEL = 'Days after discharge';
YAXIS LABEL = 'Daily risk of readmission for diagnostic category' GRID VALUES
= (0 TO 0.0006 BY 0.0001);

```

```

TITLE 'DAILY RISK OF DIFFERENT REHOSPITALIZATIONS AFTER PNEUMONIA INDEX
HOSPITALIZATION (2012-13)';
RUN;

/* Figure 1B */
PROC SGPLOT DATA = mm.merge_pandi1314n;
SERIES X = T1 Y = Risk_infec / LEGENDLABEL = 'Infectious'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_circ / LEGENDLABEL = 'Circulatory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y = Risk_Resp / LEGENDLABEL = 'Respiratory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_renal / LEGENDLABEL = 'Genitourinary'
  MARKERS LINEATTRS = (THICKNESS = 2);
XAXIS LABEL = 'Days after discharge';
YAXIS LABEL = 'Daily risk of readmission for diagnostic category' GRID VALUES
= (0 TO 0.0006 BY 0.0001);
TITLE 'DAILY RISK OF DIFFERENT REHOSPITALIZATIONS AFTER PNEUMONIA INDEX
HOSPITALIZATION (2013-14)';
RUN;

/* Figure 1C */
PROC SGPLOT DATA = mm.merge_pandi1415n;
SERIES X = T1 Y = Risk_infec / LEGENDLABEL = 'Infectious'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_circ / LEGENDLABEL = 'Circulatory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y = Risk_Resp / LEGENDLABEL = 'Respiratory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_renal / LEGENDLABEL = 'Genitourinary'
  MARKERS LINEATTRS = (THICKNESS = 2);
XAXIS LABEL = 'Days after discharge';
YAXIS LABEL = 'Daily risk of readmission for diagnostic category' GRID VALUES
= (0 TO 0.0006 BY 0.0001);
TITLE 'DAILY RISK OF DIFFERENT REHOSPITALIZATIONS AFTER PNEUMONIA INDEX
HOSPITALIZATION (2014-15)';
RUN;

/* Figure 2A */
PROC SGPLOT DATA = mm.merge_sepsis1213n;
SERIES X = T1 Y = Risk_infec / LEGENDLABEL = 'Infectious'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_circ / LEGENDLABEL = 'Circulatory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y = Risk_Resp / LEGENDLABEL = 'Respiratory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_renal / LEGENDLABEL = 'Genitourinary'
  MARKERS LINEATTRS = (THICKNESS = 2);
XAXIS LABEL = 'Days after discharge';
YAXIS LABEL = 'Daily risk of readmission for diagnostic category' GRID VALUES
= (0 TO 0.0006 BY 0.0001);
TITLE 'DAILY RISK OF DIFFERENT REHOSPITALIZATIONS AFTER SEPSIS INDEX
HOSPITALIZATION (2012-13)';
RUN;

```

```

/* Figure 2B */
PROC SGPLOT DATA = mm.merge_sepsis1314n;
SERIES X = T1 Y = Risk_infec / LEGENDLABEL = 'Infectious'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_circ / LEGENDLABEL = 'Circulatory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y = Risk_Resp / LEGENDLABEL = 'Respiratory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_renal / LEGENDLABEL = 'Genitourinary'
  MARKERS LINEATTRS = (THICKNESS = 2);
XAXIS LABEL = 'Days after discharge';
YAXIS LABEL = 'Daily risk of readmission for diagnostic category' GRID VALUES
= (0 TO 0.0006 BY 0.0001);
TITLE 'DAILY RISK OF DIFFERENT REHOSPITALIZATIONS AFTER SEPSIS INDEX
HOSPITALIZATION (2013-14)';
RUN;

```

```

/* Figure 2C */
PROC SGPLOT DATA = mm.merge_sepsis1415n;
SERIES X = T1 Y = Risk_infec / LEGENDLABEL = 'Infectious'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_circ / LEGENDLABEL = 'Circulatory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y = Risk_Resp / LEGENDLABEL = 'Respiratory'
  MARKERS LINEATTRS = (THICKNESS = 2);
SERIES X = T1 Y =Risk_renal / LEGENDLABEL = 'Genitourinary'
  MARKERS LINEATTRS = (THICKNESS = 2);
XAXIS LABEL = 'Days after discharge';
YAXIS LABEL = 'Daily risk of readmission for diagnostic category' GRID VALUES
= (0 TO 0.0006 BY 0.0001);
TITLE 'DAILY RISK OF DIFFERENT REHOSPITALIZATIONS AFTER SEPSIS INDEX
HOSPITALIZATION (2014-15)';
RUN;

```

```

*****Table 1*****;
Data tab;
set mm.Paccohort_ltcfcrisk_30d;
run;
/* 30 day rehospitalizations followed by index Pneumonia hospitalization */
data up1;
set tab;
where time_to_rehosp<=30 and index_pandi=1;
run;
/* 30 day rehospitalizations followed by index Sepsis hospitalization */
data up2;
set tab;
where time_to_rehosp<=30 and index_sepsis=1;
run;
proc freq data=up1;
tables rehosp rehosp_planned rehosp_unplanned / missing;
run;

proc freq data=up2;
tables rehosp rehosp_planned rehosp_unplanned / missing;

```

```

run;

/*30-day unplanned rehospitalization followed by index Pneumonia
hospitalization*/
data c1;
set up1;
if re hosp_unplanned=1 then output;
run;
*Descriptives for overall cohort;
proc freq data=c1;
tables hksex hkrace1 re hosp comorbidscorecat frailtyindexcat m3_adlcat
m3_chesscat m3_CFScat;
run;

proc means data=c1 mean clm n nmiss maxdec=2;
var SNF_stay age_at_index index_hilos;
run;

/*30-day planned rehospitalization followed by index Pneumonia
hospitalization*/
data c2;
set up1;
if re hosp_planned=1 then output;
run;
*Descriptives for overall cohort;
proc freq data=c2;
tables hksex hkrace1 re hosp comorbidscorecat frailtyindexcat m3_adlcat
m3_chesscat m3_CFScat;
run;

proc means data=c2 mean clm n nmiss maxdec=2;
var SNF_stay age_at_index index_hilos;
run;

/*No 30-day rehospitalizations followed by index Pneumonia hospitalization*/
data c3;
set up1;
if re hosp=0 then output;
run;
*Descriptives for overall cohort;
proc freq data=c3;
tables hksex hkrace1 re hosp comorbidscorecat frailtyindexcat m3_adlcat
m3_chesscat m3_CFScat;
run;

proc means data=c3 mean clm n nmiss maxdec=2;
var SNF_stay age_at_index index_hilos;
run;

/*30-day unplanned rehospitalization followed by index Sepsis
hospitalization*/
data c4;
set up2;
if re hosp_unplanned=1 then output;
run;
*Descriptives for overall cohort;
proc freq data=c4;

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tables hksex hkrace1 re hosp comorbidscorecat frailtyindexcat m3_adlcat
m3_chesscat m3_CFScat;
run;

proc means data=c4 mean clm n nmiss maxdec=2;
var SNF_stay age_at_index index_hilos;
run;

/*30-day planned rehospitalization followed by index Sepsis hospitalization*/

data c5;
set up2;
if re hosp_planned=1 then output;
run;
*Descriptives for overall cohort;
proc freq data=c5;
tables hksex hkrace1 re hosp comorbidscorecat frailtyindexcat m3_adlcat
m3_chesscat m3_CFScat;
run;

proc means data=c5 mean clm n nmiss maxdec=2;
var SNF_stay age_at_index index_hilos;
run;

/* No 30-day rehospitalizations followed by index Sepsis hospitalization*/
data c6;
set up2;
if re hosp=0 then output;
run;
*Descriptives for overall cohort;
proc freq data=c6;
tables hksex hkrace1 re hosp comorbidscorecat frailtyindexcat m3_adlcat
m3_chesscat m3_CFScat;
run;

proc means data=c6 mean clm n nmiss maxdec=2;
var SNF_stay age_at_index index_hilos;
run;

proc freq data=tab;
tables index_pandi index_sepsis;
run;

*Applying formats to the rehospitalization categories;
proc format;
value re hosp_ccs_cat
1= "Infectious and parasitic diseases"
2="Neoplasms"
3="Endocrine, nutritional, and metabolic diseases and immunity
disorders"
4="Diseases of the blood and blood-forming organs"
5="Mental illness"
6="Diseases of the nervous system and sense organs"
7="Diseases of the circulatory system"
8="Diseases of the respiratory system"
9="Diseases of the digestive system"

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10="Diseases of the genitourinary system"
11="Complications of pregnancy, childbirth, and the puerperium"
12="Diseases of the skin and subcutaneous tissue"
13="Diseases of the musculoskeletal system and connective tissue"
14="Congenital anomalies"
15="Certain conditions originating in the perinatal period"
16="Injury and poisoning"
17="Other conditions";

run;
/* Table 2 */
proc freq data=c1 order=freq;
tables re hosp_ccs_cat;
format re hosp_ccs_cat re hosp_ccs_cat.;
run;
proc freq data=c1 order=freq;
tables re hosp_ccs_cat;
where cohort="2012_2013";
format re hosp_ccs_cat re hosp_ccs_cat.;
run;
proc freq data=c1 order=freq;
tables re hosp_ccs_cat;
where cohort="2013_2014";
format re hosp_ccs_cat re hosp_ccs_cat.;
run;
proc freq data=c1 order=freq;
tables re hosp_ccs_cat;
where cohort="2014_2015";
format re hosp_ccs_cat re hosp_ccs_cat.;
run;
proc freq data=c1 order=freq;
tables re hosp_I9_DXCCS_PDX;
run;
proc freq data=c1 order=freq;
tables re hosp_I9_DXCCS_PDX;
where cohort="2012_2013";
run;
proc freq data=c1 order=freq;
tables re hosp_I9_DXCCS_PDX;
where cohort="2013_2014";
run;
proc freq data=c1 order=freq;
tables re hosp_I9_DXCCS_PDX;
where cohort="2014_2015";
run;
proc freq data=c1;
tables cohort;
run;
proc freq data=c1 order=freq;
tables re hosp_ccs_cat;
format re hosp_ccs_cat re hosp_ccs_cat.;
run;

proc freq data=c1 order=freq;
tables re hosp_ccs_cat re hosp_I9_DXCCS_PDX;
run;

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```

/* Table 3 */
proc freq data=c4 order=freq;
tables re hosp_I9_DXCCS_PDX;
run;
proc freq data=c4 order=freq;
tables re hosp_I9_DXCCS_PDX;
where cohort="2012_2013";
run;
proc freq data=c4 order=freq;
tables re hosp_I9_DXCCS_PDX;
where cohort="2013_2014";
run;
proc freq data=c4 order=freq;
tables re hosp_I9_DXCCS_PDX;
where cohort="2014_2015";
run;

proc freq data=c4 order=freq;
tables re hosp_ccs_cat;
format re hosp_ccs_cat re hosp_ccs_cat.;
run;
proc freq data=c4 order=freq;
tables re hosp_ccs_cat;
where cohort="2012_2013";
format re hosp_ccs_cat re hosp_ccs_cat.;
run;
proc freq data=c4 order=freq;
tables re hosp_ccs_cat;
where cohort="2013_2014";
format re hosp_ccs_cat re hosp_ccs_cat.;
run;
proc freq data=c4 order=freq;
tables re hosp_ccs_cat;
where cohort="2014_2015";
format re hosp_ccs_cat re hosp_ccs_cat.;
run;

/*Table 4*/
/*Mean time to re hosp following PNEUMONIA index hosp*/
proc means data=c1 mean n nmiss clm maxdec=2;
class cohort;
var time_to_re hosp;
where re hosp_ccs_cat=1;
run;
proc means data=c1 mean n nmiss clm maxdec=2;
class cohort;
var time_to_re hosp;
where re hosp_ccs_cat=7;
run;
proc means data=c1 mean n nmiss clm maxdec=2;
class cohort;
var time_to_re hosp;
where re hosp_ccs_cat=8;
run;
proc means data=c1 mean n nmiss clm maxdec=2;
class cohort;

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var time_to_rehosp;
where rehosp_ccs_cat=10;
run;

proc means data=c1 mean n nmiss clm maxdec=2;
class cohort;
var time_to_rehosp;
run;

/*Mean time to rehosp following Sepsis index hosp*/

proc means data=c4 mean n nmiss clm maxdec=2;
class cohort;
var time_to_rehosp;
where rehosp_ccs_cat=1;
run;
proc means data=c4 mean n nmiss clm maxdec=2;
class cohort;
var time_to_rehosp;
where rehosp_ccs_cat=7;
run;
proc means data=c4 mean n nmiss clm maxdec=2;
class cohort;
var time_to_rehosp;
where rehosp_ccs_cat=8;
run;
proc means data=c4 mean n nmiss clm maxdec=2;
class cohort;
var time_to_rehosp;
where rehosp_ccs_cat=10;
run;

proc means data=c4 mean n nmiss clm maxdec=2;
class cohort;
var time_to_rehosp;
run;

proc freq data= c1;
tables cohort;
run;
proc freq data= c4;
tables cohort;
run;

```