SUPPLEMENTAL MATERIAL

Appendix A: R code for estimating cumulative incidence functions, subdistribution hazard models, and cause-specific hazard models

```
library(survival)
library(cmprsk)

dat.effect <- data.frame(read.table("cohort.txt",header=T))

# survival.time denotes the survival time: time to occurrence of
# the first event.

# event.type is the event type indicator:
# 1: Cardiovascular death.
# 2: Non-cardiovascular death.
# 0: Censored observation: alive at end of follow-up.

dat.effect$cardiac.death <- ifelse(dat.effect$event.type==1,1,0)
# Create variable denoting occurrence of cardiac death.

dat.effect$other.death <- ifelse(dat.effect$event.type==2,1,0)
# Create variable denoting occurrence of non-cardiac death.

dat.effect$event <- ifelse(dat.effect$event.type > 0,1,0)
# Create event indicator for any type of event.

attach(dat.effect)

#########################################################################
# Figure 1: Plot cumulative incidence functions for cardiovascular
# death and non-cardiovascular in the combined sample.
#########################################################################

postscript("CIF.figure.ps",horizontal=T,paper="letter")

cif1 <- cuminc(ftime=survival.time,fstatus=event.type,cencode=0)

plot(cif1$"1 1"$time,cif1$"1 1"$est,type="l",
  ylim=c(0,0.7),
  xlab="Survival time (days)",ylab="Probability",
  lty=1,col="red")
title("Figure 1. Cumulative Incidence functions")

lines(cif1$"1 2"$time,cif1$"1 2"$est,type="l",
  lty=1,col="blue")

legend("topleft",
```

```
  legend = c("Cardiovascular death (CIF)","Non-cardiovascular death
(CIF)",
    "All-cause death (1-KM)/Sum of two CIFs"),
  lty = c(1,1,1),
  col = c("red","blue","black"),
  bty="n")

km.composite <- survfit(Surv(survival.time,event) ~ 1)

lines(km.composite$time,1-
km.composite$surv,type="l",lty=1,col="black")

#########################################################################
# Subdistribution hazard models and cause-specific hazard models.
#########################################################################

cov.mat <-
cbind(Age,resp,sbp,urea,cancer,cirrhosis,cvd,dementia,copd,HGB100,
  SOD136)

crr.1 <- crr(survival.time,event.type,cov.mat,failcode=1,cencode=0)
# Subdistribution hazard model for cardiovascular death.
crr.2 <- crr(survival.time,event.type,cov.mat,failcode=2,cencode=0)
# Subdistribution hazard model for non-cardiovascular death.

cox.1 <- coxph(Surv(survival.time,cardiac.death) ~ Age + resp + sbp +
  urea + cancer + cirrhosis + cvd + dementia + copd + HGB100 + SOD136)
# Cause-specific hazard for cardiovascular death.
cox.2 <- coxph(Surv(survival.time,other.death) ~ Age + resp + sbp +
  urea + cancer + cirrhosis + cvd + dementia + copd + HGB100 + SOD136)
# Cause-specific hazard for non-cardiovascular death.

summary(crr.1)
summary(crr.2)
summary(cox.1)
summary(cox.2)
```

Appendix B: SAS code for estimating cumulative incidence functions, subdistribution hazard models and cause-specific hazard models.

```
/* survival_time denotes the time to event. */
/* event_type is the event-type indicator variable: */
/* event_type = 1 denotes cardiovascular death.     */
/* event_type = 2 denotes non-cardiovascular death. */
/* event_type = 0 denotes a censored observation.   */
/* The data are stored in a SAS working dataset called ‘cohort’ */

%cif(data=cohort,out=cif1_data,time=survival_time,status=event_type,
    event=1,censored=0,title=Cardiac death);
%cif(data=cohort,out=cif2_data,time=survival_time,status=event_type,
    event=2,censored=0,title=Non-cardiac death);

proc phreg data=cohort;
  model survival_time*event_type(0) = age resp sbp urea cancer
    cirrhosis cvd dementia copd sod136 hgb100 /eventcode = 1 rl;
  /* Subdistribution hazard model for cardiovascular death */
run;

proc phreg data=cohort;
  model survival_time*event_type(0) = age resp sbp urea cancer
    cirrhosis cvd dementia copd sod136 hgb100 /eventcode = 2 rl;
  /* Subdistribution hazard model for non-cardiovascular death */
run;

proc phreg data=cohort;
  model survival_time*event_type(0,2) = age resp sbp urea cancer
    cirrhosis cvd dementia copd sod136 hgb100 /ties=efron rl;
  /* Cause-specific hazard model for cardiovascular death */
run;

proc phreg data=cohort;
  model survival_time*event_type(0,1) = age resp sbp urea cancer
    cirrhosis cvd dementia copd sod136 hgb100 /ties=efron rl;
  /* Cause-specific hazard model for non-cardiovascular death */
run;
```