Report for the Markov model (cohort state-transition model)

2020.12.16

Results from the paper

These two tables are from the result part of the paper by Yaqin Si.

```
strategy_names <- c("strategy1", "strategy2", "strategy3")
# QALY
QALY <- data.frame("est" = c(498,691,654),
                   "LB" = c(103,233,105),
                   "UB" = c(894,194,1108))
rownames(QALY) <- strategy_names
# Prevent CVD events
num_CVD <- data.frame("est" = c(298,374,346),
                   "LB" = c(155,181,154),
                   "UB" = c(441,567,538))
rownames(num_CVD) <- strategy_names
```

Table 1: Increased QALY with no screening

	est	LB	UB
strategy1	498	103	894
strategy2	691	233	194
strategy3	654	105	1108

Table 2: Prevent CVD events

	est	LB	UB
strategy1	298	155	441
strategy2	374	181	567
strategy3	346	154	538

Markov model

```
# parameters TODO
cycle <- 4
factor <- 0.8
```

```
# transition probability and related parameters
# calculated by ratetoprob function, based on the incidence of a disease and incidence of a death from
library(readr)
rate_data <- read_csv("data/ghdx_data.csv")
```

```
## Parsed with column specification:
## cols(
##   Index = col_double(),
##   sex = col_character(),
##   rate_incidence_CVD = col_double(),
```

```
##   rate_death_CVD = col_double(),
##   rate_death_nonCVD = col_double()
## )
```

```
source("./function/transform_func.R")
p_live_oth_death <- RateToProb(rate=rate_data$rate_death_nonCVD,t=cycle)
p_live_cvd <- RateToProb(rate=rate_data$rate_incidence_CVD,t = cycle)
p_live_cvdth <- RateToProb(rate=rate_data$rate_death_CVD,t = cycle)
# incidence rate of the cohort of 3 levels
p_live_cvd_l <- ProbFactor(p_live_cvd,factor)
p_live_cvd_m <- ProbFactor(p_live_cvd,factor)
p_live_cvd_h <- ProbFactor(p_live_cvd,factor)
# death rate of the cohort of 3 levels
p_live_cvdth_l <- ProbFactor(p_live_cvdth,factor)
p_live_cvdth_m <- ProbFactor(p_live_cvdth,factor)
p_live_cvdth_h <- ProbFactor(p_live_cvdth,factor)
```

```
# Health Status
```

```
# chi-squared test

# t-test
```

```
HR_l_stg1   <- 0.63
HR_l_stg2   <- 0.43
HR_l_stg3   <- 0.45
HR_m_stg1   <- 1.56
HR_m_stg2   <- 0.97
HR_m_stg3   <- 1.09
HR_h_stg1   <- 1.6
HR_h_stg2   <- 2.06
HR_h_stg3   <- 2.11
```