Appendix 2 prisoner_hybrid_functions

# Calculate daily discount rate using annual discount rate 3%
discount_c<-{(1+0.03)^(1/365)}-1
discounted.value<-function(value,day){
  discounted<-value/(1+discount_c)^day
}

# Fit the Gamma distribution using method of moments
gamfit_mom = function(x){
  # assume x is a vector of data
  m = mean(x)
  v = var(x)
  se2 = v/length(x)
  shp = m^2/se2
  sc = se2/m
  return(c(shp, sc))
}

# Fit the Beta distribution using method of moments
betafit_mom = function(p, n){
  # p is the estimated proportion, n sample size used to calculate
  se2 = p*(1-p)/n  # variance of the mean
  sumab = (p*(1-p)/se2) -1
  ab = p*sumab
  bb = (1-p)*sumab
return(c(ab, bb))

# Fit the Beta distribution using mean and variance
betafit=function(mu, var){
  alpha <- ((1 - mu) / var - 1 / mu) * mu ^ 2
  beta <- alpha * (1 / mu - 1)
  return(c(alpha, beta))
}

# update transition data frame
transition.updated<- function(transition, day, c, p, h, e, total, cost_c, cost_p, cost_h, cost_e, QALY_c, QALY_p, QALY_h, QALY_e){
  transition<- rbind(transition, data.frame(day=day, community=c, prison=p, hospital=h, ED=e, total=total, Cost_c=cost_c, Cost_p=cost_p, Cost_h=cost_h, Cost_e=cost_e, QALY_c=QALY_c, QALY_p=QALY_p, QALY_h=QALY_h, QALY_e=QALY_e))
}

# function to calculate the number of people in prison every day
total.prison<- function(L, time_to_event){
  if(L>time_to_event){
  }else{
    no.p<- sum(n.p)
  }
  return(no.p)
}
# function to calculate the number of people in hospital every day

total.hospital <- function(L, time_to_event) {
  if(L > time_to_event) {
    no.h <- N.h[L-1] + n.h[L] - n.h[L-time_to_event]
  } else {
    no.h <- sum(n.h)
  }
  return(no.h)
}