Poison_time_dep_simplification

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Contents

```
#Reading the data
data_netherland<- read.csv("/Users/aurorahofman/Documents/Utveksling/Baysiana/UPC-Final-Project-Bayesian
```

```
#Extracting the data for the Netherlands
mean_netherland <- as.vector(as.matrix(data_netherland)[,6])
netherland_2020<-as.vector(as.matrix(data_netherland)[,5])
```

```
create_list <- function(N, E, O){
  data_list <-  list(
  N = N,
  E = E,
  O = O,
  sigma_a = 0.01,
  sigma_b = 4,
  alpha_mu = 0,
  alpha_sigma = 4,
  beta_a = -1,
  beta_b = 1,
  sigma_time_mu = 0,
  sigma_time_sigma= 25,
  gamma_a = 0.5,
  gamma_b = 100000
  )
  return(data_list)
}
```

```
data_list_netherland <- create_list(length(mean_netherland), mean_netherland, netherland_2020)
```

```
risk_netherland <- stan("/Users/aurorahofman/Documents/Utveksling/Baysiana/UPC-Final-Project-Bayesian-An
  data = data_list_netherland, seed = 1, control = list(adapt_delta = params$adapt_delta, max_treedepth
```

```
####################
# Helper functions
####################

#Function for output graphs
plot_risk <- function(data, country_name){
  g<- ggplot(data = data, aes(x = week, y = theta)) + geom_point() + geom_line(lty = 2) +
    geom_line(aes(week, CI_lower), col = "blue", lty = 2) +
    geom_line(aes(week, CI_upper), col = "blue", lty = 2) +
    geom_hline(yintercept = 1, col = "red")+
```

```
    ggtitle("Relative risk for" , country_name)
  ggsave(paste0("output_",country_name,".png"))
  return(g)
}

# Function for creating the dataframe with thetas and the bounds for the credible interval.

create_CI_theta_vec <- function(risk_data, N){
  fit<-summary(risk_data)
  results <- as.data.frame(fit$summary)

  CI_upper <- exp(results$`97.5%`[1:N]) #+results$`97.5%`[(N+1):(2*N)])
  CI_lower <- exp(results$`2.5%`[1:N]) #+results$`2.5%`[(N+1):(2*N)])

  theta <- exp(results$mean[1:N])# +results$mean[(N+1):(2*N)])
  week <- seq(1:N)
  data <- data.frame(week, CI_upper, CI_lower, theta)
  return(data)

}
```

0.0.1 The Netherlands

```
print(risk_netherland)
```

```
data_netherland <- create_CI_theta_vec(risk_netherland, length(mean_netherland))
plot_risk(data_netherland, "Netherland")
```