JimDuggan / seirR Private

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README.md

Sensitivity runs

The model can be run a number of times to support sensitivity analysis. Here, the package **purrr** is used to generate a large output data set (which is essentially a collation of all the individual runs, with a new ID added to the table so that the primary key is {RunNumber, SimDay})

- First, load in the libraries.

```
library(seirR)


## Welcome to package seirR v0.0.0.1

## Checking https://covid.ourworldindata.org/data/ecdc/full_data.csv  for data update...

## Loading https://covid.ourworldindata.org/data/ecdc/full_data.csv  to global environment data_env


library(ggplot2)
library(purrr)
library(dplyr)


##
## Attaching package: 'dplyr'

## The following object is masked from 'package:seirR':
##
##     explain

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

- Create the model, and set the physical distancing option

```
mod <- create_seir_p()
mod <- set_param(mod,"distancing_flag",1)
```

- Set the sensitivity parameter ranges, and the number of runs. Packages such as FME can be used for this, as it supports a wider range of random number generations. https://cran.r-project.org/web/packages/FME/index.html

```
NRUNS <- 10

lower <- 0.2
upper <- 0.8
percentages    <- runif(NRUNS,.1,.9)
f_asymptomatic <- runif(NRUNS,.15,.7)
```

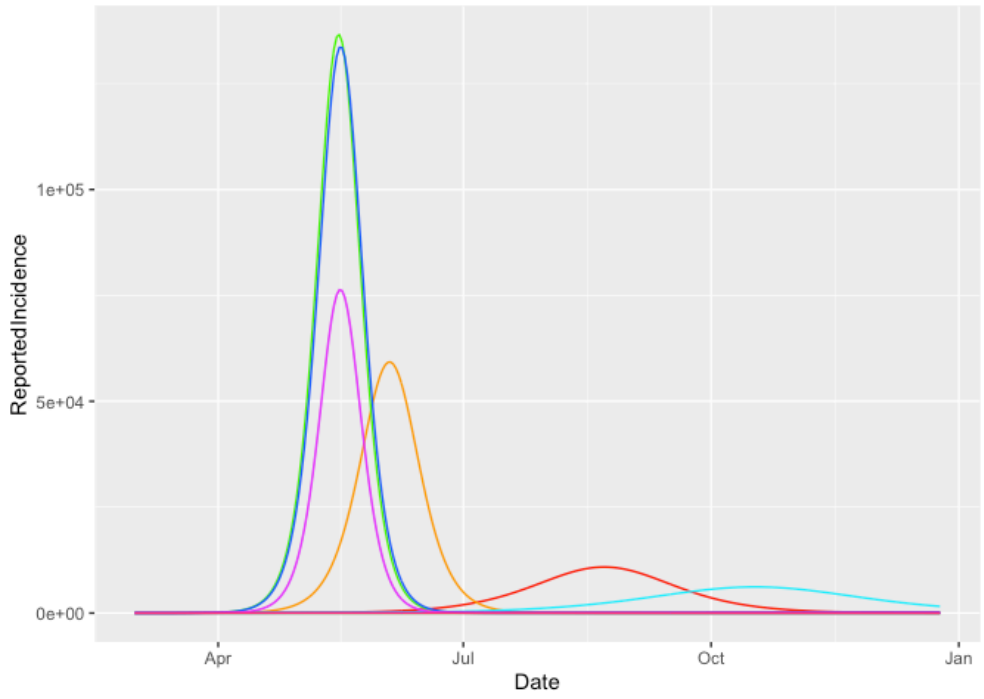
- Write a script to run the model a number of times, sampling from the random number streams

```
res_full <- map_df(1:NRUNS, function(i){
  cat("iteration = ", i, "with percentage = ", percentages[i], " and f = ",f_asymptomatic[i],"\n")
  mod <- set_param(mod,"pd_percentage_reduction",percentages[i])
  mod <- set_param(mod,"prop_asymptomatic",f_asymptomatic[i])
  out2 <- run(mod) %>% mutate(RunNumber=i) %>%
     select(RunNumber,everything())
})
```

```
## iteration =  1 with percentage =  0.5475142  and f =  0.6476609
## iteration =  2 with percentage =  0.3642019  and f =  0.5198257
## iteration =  3 with percentage =  0.7078094  and f =  0.4796776
## iteration =  4 with percentage =  0.2770122  and f =  0.2674452
## iteration =  5 with percentage =  0.8192057  and f =  0.2859403
## iteration =  6 with percentage =  0.6060648  and f =  0.5831134
## iteration =  7 with percentage =  0.2861077  and f =  0.2689446
## iteration =  8 with percentage =  0.6975361  and f =  0.401058
## iteration =  9 with percentage =  0.1347621  and f =  0.6087271
## iteration =  10 with percentage =  0.7293567  and f =  0.4066658
```

- Show all the results for one of the variables

```
ggplot(res_full,aes(x=Date,y=ReportedIncidence,colour=RunNumber,group=RunNumber))+geom_path()+
       scale_colour_gradientn(colours=rainbow(12))+guides(color=FALSE)
```


1e+05
5e+04
0e+00
Reported Incidence
Apr
Jul
Oct
Jan
Date