Epidemiological simulation report

Objective:

Dynamic epidemiological modeling is a powerful tool to analyse risk of pathogen persistence and spread, following an introduction in a population, as well as predicting the impact of surveillance and control strategies. In small populations such as patients and health care workers in health care settings, heterogeneity and stochasticity play fundamental roles due to high risk of super-spreading or epidemic extinction. Epidemic models of hospital-acquired infections generally consider a unique homogeneous population and do not account for the organizational or multi-ward structure, hindering the capacity of models to capture nosocomial spread processes accurately.

Methods: .

This report contains synthetic output generated using the open source R package 'MWSS' which uses the Gillespie algorithm, implemented with SimInf R-package.

```
## [1] "Simulations presented in this report were run for a1-ward healthcare facility."
```

Results:

To reconcile estimates of incidence and prevalence, recall bias needed to be represented in the model. This suggests that the population prevalence of mood and anxiety disorders has been underestimated by population surveys and may explain a discrepancy observed in the age-specific prevalence in population surveys as compared with studies using administrative data. The number of Canadians with mood and anxiety disorders is projected to increase in upcoming decades as a result of population growth, but, based on conservative assumptions, an increased prevalence proportion is not anticipated.

Conclusions:

Simulation models can act as a platform for economic analyses and epidemiologic projections and can support the rapid exploration of what-if scenarios, thereby informing policy decisions. This first national-level simulation provides a high level overview of mood and anxiety disorder epidemiology in Canada.

length(params$trajectories)

```
## [1] 1
```

Plot test

```
## [1] 8
```

Modelling project:

Supported by the Département d'information médicale of the Centre hospitalier Guillaume Régnier (Rennes, France), a simulation modelling project was undertaken during 2020 pandemic to evaluate the effect of infection control protocols on SARS-CoV-2 spread in french long-term care facilities. The modelling was carried out by the french Pasteur Institute, the french Conservatoire national des arts et métiers and the french University of Versailles Saint-Quentin-en-Yvelines, in collaboration with the Department of Disease Control and Epidemiology of the National Veterinary Institute of Sweden. Epidemiological simulation are performed using R-based packages: mwss and SimInf.

Note that simulations were run locally and, to deal with data confidentiality challenges, the parameters and simulations were not saved on our servers.