

SpatialEpiApp: a Shiny web application for the analysis of spatial and spatio-temporal disease data

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SpatialEpiApp

Shiny web application that allows to visualize spatial and spatio-temporal disease data, estimate disease risk and detect clusters.

- Developed with Shiny, a web application framework for R
- Risk estimates by fitting Bayesian models with INLA
- Detection of clusters by using the scan statistics in SaTScan
- R package SpatialEpiApp
- <https://paulamoraga.shinyapps.io/spatialepiapp/>



Inputs

1. Upload map (shapefile)

Upload all map files at once: shp, dbf, shx and prj.

Browse... 5 files

Select columns id and name of the areas in the map.

area id	area name
NAME	NAME

Optional: Select column name of the regions in the map.

If the number of areas is big, the leaflet map will not render. By specifying regions containing a small number of areas, only areas within the selected region will be shown in the interactive results.

region name

2. Upload data (.csv file)

File needs to have columns <area id><date><population><cases>
Optional: It can also include columns with up to four covariates <covariate1>...<covariate4>.

Browse... datahiocomplete.csv

Select columns id, date, population and cases in the data.

area id	date
NAME	year

population	cases
n	y

Optional: Select columns covariate 1, covariate 2, covariate 3, covariate 4.
Leave the boxes with - if the data do not contain covariates.

covariate 1	covariate 2
gender	race

covariate 3	covariate 4
-	-

Note: Area id is a unique identifier of the area. Area id in the data should be the same as area id in the map. Dates can be written in year (yyyy), month (yyyy-mm) or day (yyyy-mm-dd) format. Dates should be consecutive. Data should contain the population and cases for all combinations of area id, date and covariates.

3. Select analysis

Select the temporal unit in the data. It can be year, month or day depending on the format of the dates in the data file.

Temporal unit

Year (yyyy) Month (yyyy-mm) Day (yyyy-mm-dd)

Select minimum and maximum dates of the analysis. Only data with date within the date range will be used in the analysis.

Date range

1981-01-01 to 1984-01-01

Type of analysis

Spatial Spatio-temporal

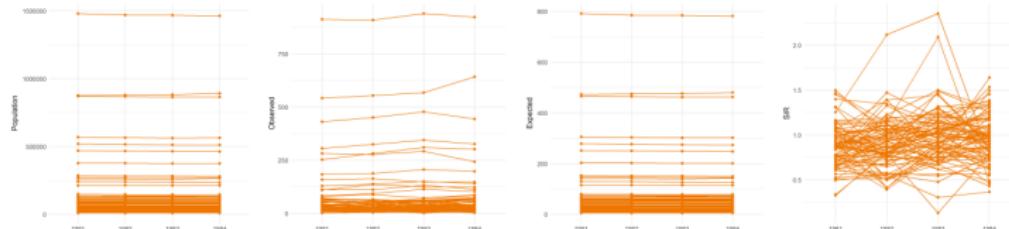
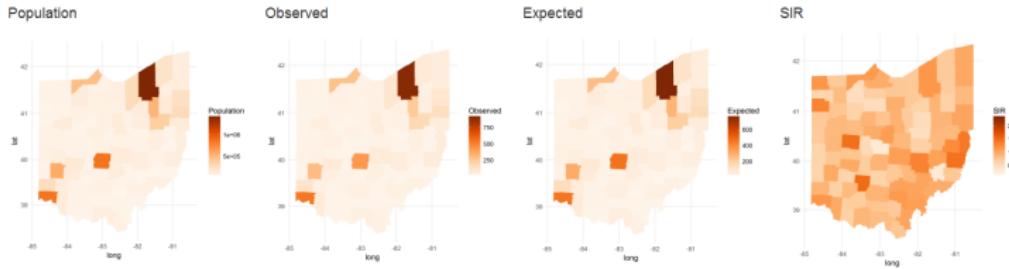
Interactive

Maps

Interactive Maps Clusters Report

Date: 1981

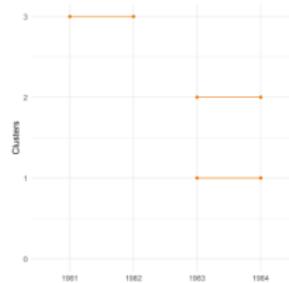
Population	Observed	Expected	SIR
Min. : 11253	Min. : 2.00	Min. : 6.108	Min. : 0.3274
1st Qu.: 32443	1st Qu.: 14.00	1st Qu.: 17.723	1st Qu.: 0.7179
Median : 54588	Median : 22.50	Median : 29.381	Median : 0.8641
Mean : 122617	Mean : 62.58	Mean : 66.037	Mean : 0.8709
3rd Qu.: 104815	3rd Qu.: 50.00	3rd Qu.: 56.468	3rd Qu.: 1.0115
Max. : 1481287	Max. : 913.00	Max. : 791.923	Max. : 1.4989



Clusters

Interactive Maps Clusters Report

Date: 1984



Show 25 entries

Search:

Cluster	Central area	No. areas	Start date	End date	Risk in / Risk out	LLR	p-value	Areas
1	Hamilton	1	1983	1984	1.32	41.75818	1.23e-14	Hamilton
2	Cuyahoga	1	1983	1984	1.21	28.87297	1.04e-09	Cuyahoga
3	Belmont	5	1981	1982	1.30	10.54458	1.06e-02	Guernsey, Monroe, Harrison, Belmont, Jefferson

Showing 1 to 3 of 3 entries

Previous Next

Report

Interactive Maps Clusters Report

 Download report

Choose the variables to include in the report. Variables that have not been calculated will not be included.

Maps

Population Observed Expected SIR Risk 2.5 percentile 97.5 percentile Clusters

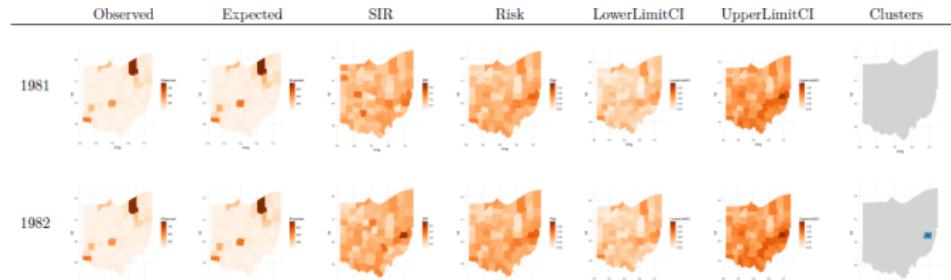
Tables summary

Population Observed Expected SIR Risk 2.5 percentile 97.5 percentile

Table clusters

Clusters

- Date range: 1981 to 1984
- Type of analysis: Spatio-Temporal
- Temporal unit: Year



References

-  P. Moraga. SpatialEpiApp: A Shiny Web Application for the analysis of Spatial and Spatio-Temporal Disease Data, (2017), *Spatial and Spatio-temporal Epidemiology*, 23:47-57
-  H. Rue, S. Martino and N. Chopin. Approximate Bayesian inference for latent Gaussian models using integrated nested Laplace approximations (with discussion), (2009), *Journal of the Royal Statistical Society, Series B*, 71(2):319-392
-  M. Kulldorff. SaTScan(TM) v. 7.0. Software for the spatial and space-time scan statistics, (2006), URL <http://www.satscan.org/>