

# Case, travel, socioeconomic and meteorological data for analysing socioeconomic and environmental patterns behind H1N1 spreading in Sweden

**SND-ID:** 2021-282-1. **Version:** 1. **DOI:** <https://doi.org/10.5878/0hkf-tn97>

## Download data

giim\_cascounts.xlsx (230.88 KB)

giim\_export\_risk.csv (48.82 KB)

giim\_import\_risk.csv (42.1 KB)

giim\_kommun\_graph.csv (217.21 KB)

giim\_kommun\_indicators.csv (19.85 KB)

giim\_transmission\_prob.csv (1.8 MB)

## Associated documentation

description.txt (5.87 KB)

## Download all files

2021-282-1-1.zip (~2.36 MB)

## Citation

Bota, A., Holmberg, M., Gardner, L., & Rosvall, M. (2021) Case, travel, socioeconomic and meteorological data for analysing socioeconomic and environmental patterns behind H1N1 spreading in Sweden (Version 1) [Data set]. Umeå University. Available at: <https://doi.org/10.5878/0hkf-tn97>

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## Description

Collection of socio-economic and meteorological indicators as well as travel patterns and cases of H1N1 during the swine flu pandemic in Sweden in 2009. Comprise the supplementary information for the paper titled "Socioeconomic and environmental patterns behind H1N1 spreading in Sweden" by András Bóta, Martin Holmberg, Lauren Gardner and Martin Rosvall, Sci Rep 11, 22512 (2021). <https://doi.org/10.1038/s41598-021-01857-4>

Identifying the critical socio-economic, travel and climate factors related to influenza spreading is critical to the prediction and mitigation of epidemics. In the paper we study the 2009 A(H1N1) outbreak in the municipalities of Sweden, following it for six years between 2009 and 2015. Our goal

is to discover the relationship between the above indicators and the timing of the epidemic onset of the disease. We also identify the municipalities playing a key role in the outbreak as well as the most critical travel routes of the country.

Publication available at: <https://doi.org/10.1038/s41598-021-01857-4>

Municipality codes for the municipalities of Sweden can be found here:

<https://www.scb.se/en/finding-statistics/regional-statistics/regional-divisions/counties-and-municipalities/counties-and-municipalities-in-numerical-order/>

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Model inputs

1. giim\_kommun\_graph.csv

Set of frequent travel routes between the municipalities of Sweden.

The graph was constructed from "Trafikanalys, 2016. Resvanor. (accessed 26.8.19). Available from: <http://www.trafa.se/RVU-Sverige/>; using the methodology described in the paper.

Date of construction: 2018-12-01

Format: csv

Structure: edge list in (kommun1;kommun2) format with rows indicating a directed link between two municipalities. Municipalities are denoted according to their official municipal code

2. giim\_cascounts.xlsx

Number of new H1N1 cases in the municipalities of Sweden between 2009 and 2015.

Our data set consists of all laboratory-verified cases of A(H1N1)pdm09 between May 2009 and December 2015, extracted

from the SmiNet register of notifiable diseases, held by the Public Health Agency of Sweden.

Due to confidentiality reasons, cases are anonymized, and addresses are aggregated at the DeSo level together with

the date of diagnosis, age, and gender. We obtained ethical approval for the data acquisition.

Date of construction: 2018-12-01

Format: xlsx

Structure: Each tab represents a single flu season from the 2009/2010 season to the 2014/2015 season.

Each tab is a matrix with rows indicating municipalities according to their official municipal code, and columns indicating epidemic weeks. Values of the matrices indicate the number of new laboratory-verified cases of A(H1N1)pdm09

3. giim\_kommun\_indicators.csv

Socioeconomic and meteorological indicators are assigned to the municipalities of Sweden according to the methodology described in the paper.

Indicators included are:

a, mean temperature in degree Celsius,

b, absolute humidity in grams per cubic metre,

c, population size as the number of people living in each municipality,

d, population density as the number of people per sq. km of land area,

e, median income per household in thousand SEK,

f, fraction of people on social aid (as a percentage),

g, average number of children younger than 18 years per household.

Meteorological data was obtained from the European Climate Assessment Dataset "Klein Tank A, Wijngaard J, Können G, Böhm R, Demarée G, Gocheva A, et al. Daily dataset of 20th-century surface air temperature and precipitation series for the European Climate Assessment. International Journal of Climatology: A Journal of the Royal Meteorological Society. 2002;22(12):1441–1453."

Data from the dataset was converted to the municipality level according to the methodology described in the paper. Variables are mean temperature and relative humidity converted to absolute humidity

for all municipalities of Sweden.

Socioeconomic data was collected from Statistics Sweden between 2018 October and 2019 February. Available from: <https://www.scb.se/en/>. Variables are: The average household income as an economic indicator. The average number of children younger than 18 years per household to indicate family size.

The fraction of people receiving social aid to represent poverty in a municipality. Population size and population density as the number of people per sq. km of land area.

Date of construction: 2018-02-01

Format: csv

Structure:

Each row corresponds to a municipality denoted according to their official municipal code. Columns indicate socioeconomic and meteorological indicators as marked by the header row.

Model outputs

1. giim\_export\_risk.csv

Exportation risk values for all municipalities from week 37 to week 50 in the fall of 2009 computed using the methodology described in the paper.

Date of construction: 2020-12-01

Format: csv

Structure: Table with rows denoting Swedish municipalities according to their official municipal code, columns denoting epidemic weeks. Values indicate exportation risk values (should not be interpreted as probabilities).

2. giim\_import\_risk.csv

Importation risk values for all municipalities from week 37 to week 50 in the fall of 2009 computed using the methodology described in the paper.

Date of construction: 2020-12-01

Format: csv

Structure: Table with rows denoting Swedish municipalities according to their official municipal code, columns denoting epidemic weeks. Values indicate importation risk values (should not be interpreted as probabilities).

3. giim\_transmission\_prob.csv

Transmission probabilities between all municipalities from week 37 to week 50 in the fall of 2009 computed using the methodology described in the paper.

Date of construction: 2020-12-01

Format: csv

Structure: Edge list with multiple edge weights. Rows indicate a directed link between the two municipalities (kommun1;kommun2) in the beginning of the row. The rest of the values in each row denote

the corresponding transmission probabilities for each epidemic week computed according to the methodology described in the paper.

**Data contains personal data**

No

**Language**

[English](#)

**Unit of analysis**

[Political-administrative area](#)

**Population**

All municipalities of Sweden

**Time Method**

[Time series: Discrete](#)

**Sampling procedure**

[Total universe/Complete enumeration](#)

**Time period(s) investigated**

2009 - 2015

**Data format / data structure**

[Numeric](#)

**Geographic spread**

Geographic location: [Sweden](#)

Geographic description: Complete set of municipalities of Sweden

**Responsible department/unit**

Department of Physics, Integrated Science Lab

**Funding 1**

- Funding agency: Olle Engkvist Byggmästare Foundation
- Funding information: Andrés Bóta was supported by the Olle Engkvist Byggmästare Foundation

**Funding 2**

- Funding agency: Swedish Research Council
- Funding agency's reference number: 2016-00796
- Funding information: Martin Rosvall was supported by the Swedish Research Council, grant 2016-00796

**Ethics Review**

Umeå

Approval was granted by the Regional Ethical Committee in Umeå on 2015-10-20.

**Research area**

[Information technology](#) (CESSDA Topic Classification)

[Computer science](#) (Standard för svensk indelning av forskningsämnen 2011)

[Public health, global health, social medicine and epidemiology](#) (Standard för svensk indelning av forskningsämnen 2011)

[Health](#) (INSPIRE topic categories)

[Specific diseases, disorders and medical conditions](#) (CESSDA Topic Classification)

[Public health](#) (CESSDA Topic Classification)

## Keywords

[Influenza](#), [Public health](#), [Epidemiology](#), [Network analysis](#), [Socioeconomic factors](#), [Influenza a-virus, subtyp h1n1](#), [Pandemics](#), [Temperature](#)

## Publications

Bóta A, Holmberg M, Gardner L, Rosvall M. Socio-economic and environmental patterns behind H1N1 spreading in Sweden. Sci Rep 11, 22512 (2021). <https://doi.org/10.1038/s41598-021-01857-4>

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Klein Tank A, Wijngaard J, Können G, Böhm R, Demarée G, Gocheva A, et al. Daily dataset of 20th-century surface air temperature and precipitation series for the European Climate Assessment. International Journal of Climatology: A Journal of the Royal Meteorological Society. 2002;22(12):1441-1453.

**DOI:** <https://doi.org/10.1002/joc.773>

If you have published anything based on these data, [please notify us](#) with a reference to your publication(s). If you are responsible for the catalogue entry, you can update the metadata/data description in DORIS.

## Accessibility level

Access to data through SND

Data are freely accessible

## Use of data

[Things to consider when using data shared through SND](#)

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## Versions

Version 1. 2021-11-03

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