Building a Sanitary Vulnerability Map from Open Source Data. Argentina, 2010-2018

CURRENT STATUS: UNDER REVIEW

International Journal for Equity in Health ▶ BMC

Germán Federico Rosati
Universidad Nacional de San Martín

german.rosati@gmail.com Corresponding Author
ORCiD: https://orcid.org/0000-0002-9775-0435

Tomás Alberto Olego
Bunge & Born Foundation

Antonio Vazquez Brust
Bunge & Born Foundation

DOI:
10.21203/rs.2.20126/v1

SUBJECT AREAS
Health Economics & Outcomes Research Health Policy

KEYWORDS
sample, article, Health, Vulnerability, Census, Public Policy, Open Data
Abstract
Background: Designing public health policies to target the needs of specific places requires highly granular data. When geographic health statistics from official sources are absent or lacking in spatial detail, Sanitary Vulnerability metrics derived from Census and other georeferenced public data can be used to identify areas in particular need of attention. With that aim, a Vulnerability Map was developed, identifying areas with a substantial deficit in its population health coverage.
Methods: Census, official listings of public health facilities and crowdsourced georeferenced data are used. The Vulnerability Index is built using dimensionality reduction techniques such as Autoencoders and Non-parametric PCA.
Main results: The high resolution map shows the geographical distribution of a Sanitary Vulnerability Index, produced using official and crowdsourced open data sources, overcoming the lack of official sources on health indicators at the local level.
Conclusions: The Sanitary Vulnerability Map’s value as a tool for place specific policymaking was validated by using it to predict local health related metrics such as health coverage. Further lines of work contemplate using the Map to study the interaction between Sanitary Vulnerability and the prevalence of different diseases, and also applying its methodology in the context of other public services such as education, security, housing, etc.

Full-text
Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Figures
Figure 1

Comparison between master data set (SISA) and a municipal source. Buenos Aires City
Figure 2

Travel time (on foot) to different classes of health facilities. Census Block Average.
Figure 3

Autoencoder model used
Figure 4

SSE by Province density plot
Figure 5

SES without and after the rankit transformation. City of Buenos Aires and Chaco Province.
Figure 6

Distances to health centers, before and after the rankit transformation. CABA and Chaco Province.
Figure 7

Sanitary Vulnerability Index
Figure 8
Sanitary Vulnerability Index. Argentina.
Figure 9

Sanitary Vulnerability Index at Census Fraction level. Argentina.
Figure 10

Index of Sanitary Vulnerability: CABA (left.), Chaco
Sanitary Vulnerability Index, by population proportion with no health care coverage (county level)
Figure 12

Sanitary Vulnerability Index, by population proportion with no health care (county level)

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

Manuscript.bbl
bmcart.cls
bmc-mathphys.bst
Manuscript.tex
bmcart-biblio.sty
biblio.bib