The role of social networks in health controversies

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Current work

- Social media and health

  – IA4DrugUsers

  – Reactions on Social Networks to Covid-19 threatments

  – DeciTrusNET (H2020 MSCA-IF)

- Artificial Intelligence methodologies applied to clinical and medical administrative databases

  – IA4Elderly : Assisting elderly cancer care management by artificial intelligence methods applied to clinical and medical administrative databases.

  – Vican-Brest-IA :Assesing quality of life after brest cancer threatment with artificial intelligence methodologies

Social media use in 2021

Infodemiology & Infodemics

- **Infodemiology :** The science of distribution and determinants of information in an electronic medium, specifically the Internet, or in a population with the ultimate aim to inform public health and public policy. (Gunter Eysenbach 2002)

- **Infodemics :** a combination of information and epidemic, refers to a fast and widespread dissemination of both accurate and inaccurate information about an epidemic. (WHO)

Goals

What is the role of social networks in health controversies?

- Topics of interests.

- Main data sources

- Main methodologies used in the analysis.

- Identify the risk, challenges and new research opportunities

Methodology

- Systematic Literature Review

- Sources: PubMed, SCOPUS, Web of Science

Keywords of interest
  Social media
  Public health
  Surveillance
  Infodemiology
  Infodemics

Inclusion Criteria

1. Published in English
2. Published 2015 or later
3. Peer-reviewed literature in the fields of medicine, public health and computer science
4. Related to a public health or medical issue
5. Data sources from social network
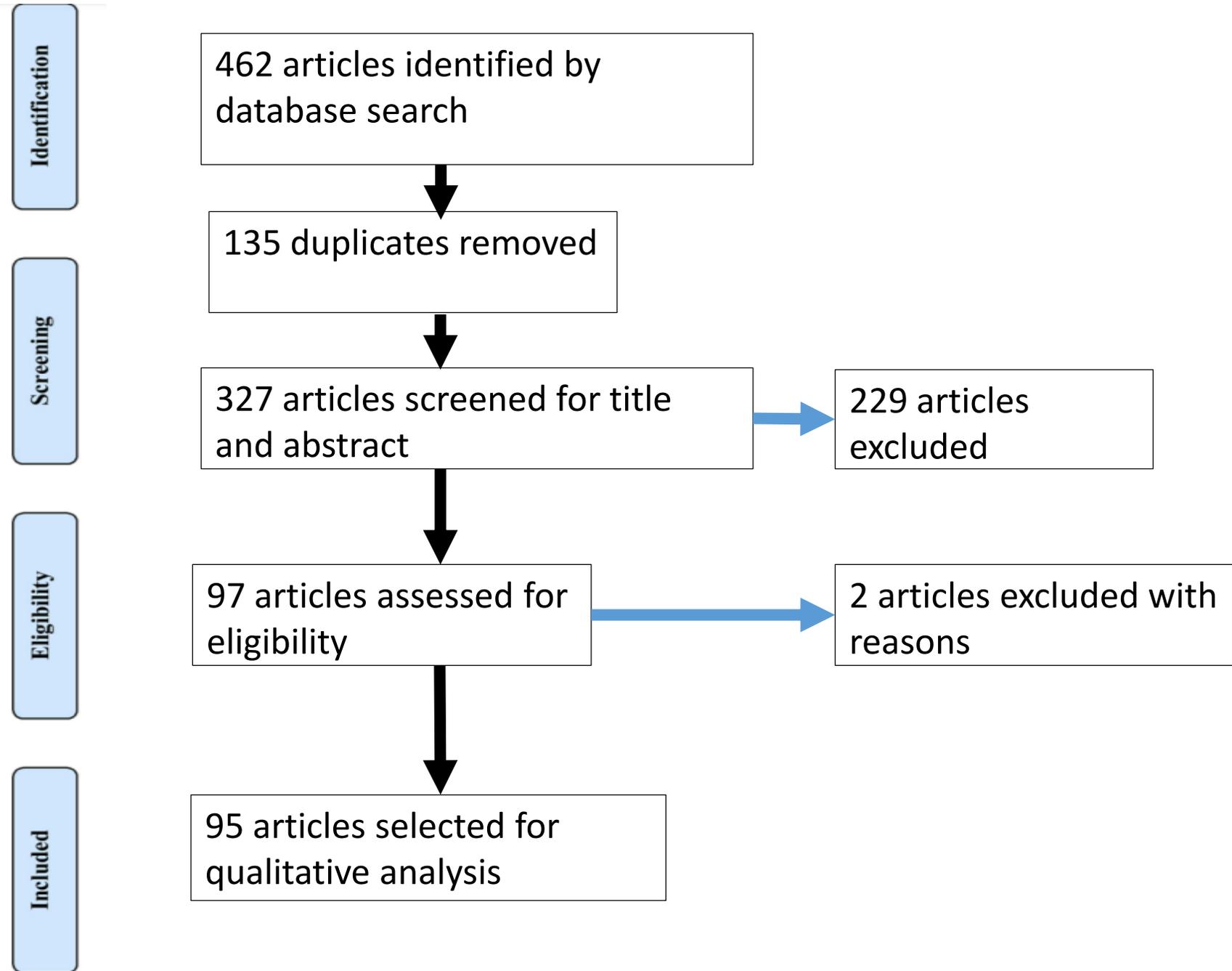
Methology :
PRISMA

# Methodology : recovered data

Target population	Target social network	Type of data	Type of controversy	Size of data (Ex. # of tweets)	Country of study	Methodology	Role of Social Networks
Twitter users in Japan	Twitter	Tweets	Scientific misconduct	12,925 tweets	Japan	Support vector machine (SVM) analysis; Statistical analysis; Sentiment	Measure public sentiment in response to scientific misconduct
Twitter users posting in either English or Filipino	Twitter	Tweets	Reactions to Diseases	A daily average of 360,056 tweets were collected from August 10, 2016 until September 10, 2016, with	Philippines	Statistical analysis	Provides real-time disease surveillance
White and African Americans over 18 years of age	Twitter and Facebook	Twitter: Users Facebook: Users	Vaccines	A total of 838 White and 819 African American users were surveyed for this study.	USA	Statistical analysis	Relationship between social media use and vaccine uptake

Results

- 27 different different social networks found

Social Network	Number of Articles
Multiples	49
Twitter	39
Facebook	6
Sina Weibo	1
Instagram	1
WhatsApp	1

Year of Publication
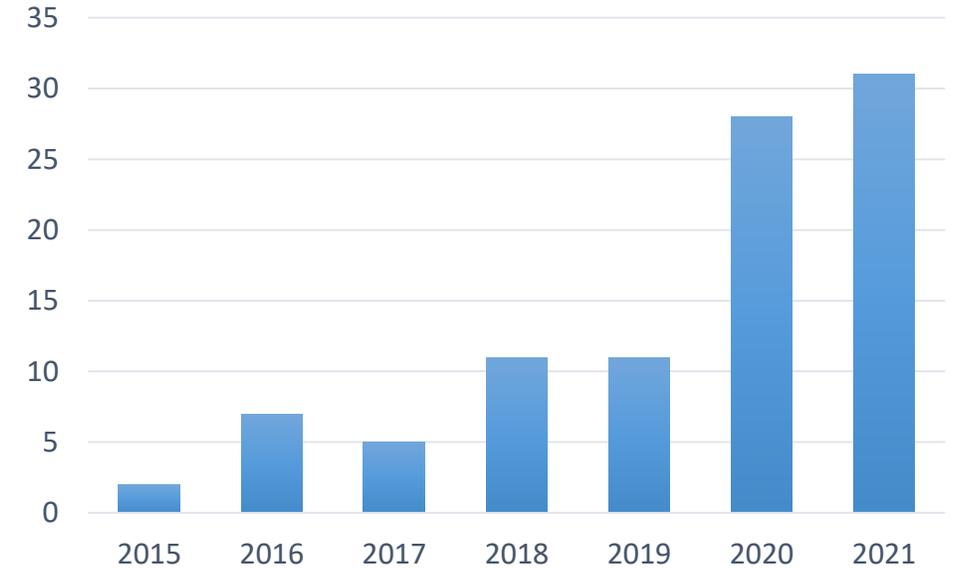
Results

Topic	# of articles
Reactions to diseases:	44
1. COVID-19 (30)	
2. Zika (5)	
3. Ebola (3)	
4. HIV (2)	
5. Dengue and Typhoid fever (1)	
6. Lupus (1)	
7. General (2)	
• **Vaccins:**	16
1. General (7)	
2. COVID-19 (4)	
3. Measles (3)	
4. Influenza (1)	
5. HPV (1)	
• **Smoking**	9

Topic	# of articles
Disease surveillance and management	8
Infodemiology and infodemics	6
Drugs: Opioids, Zolpidem	2
Physical activity and Diet	2
Health promotion	2
Food safety	2
Others	1 each

Results
Type of analysis

Statistical analyses

- Regression
- Descriptive statistics
- Spatio-Temporal distribution

Machine learning

- logistic regression
- SVM
- Random forest
- NLP
- Topic modeling LDA
- Sentiment analysis

Social network analysis

- Network morphology
- Community structure
- Influencers analysis
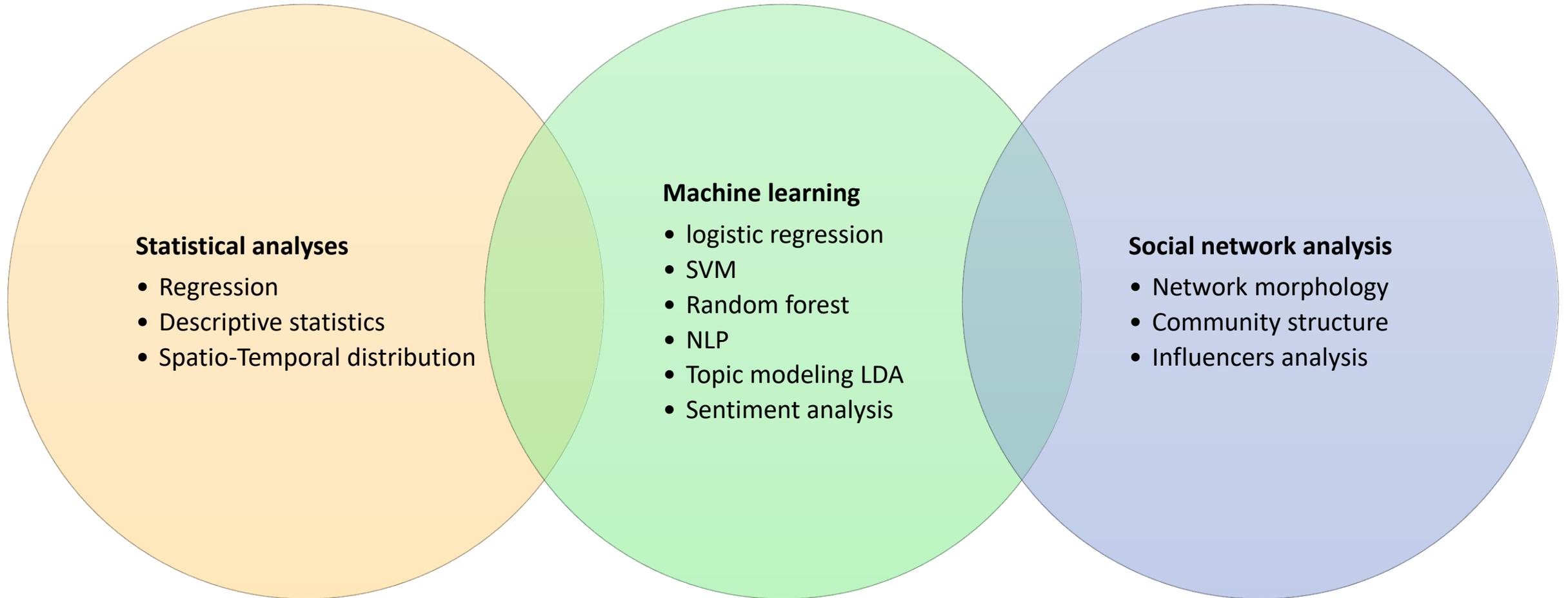
Risks

- **Misinformation** overload and **fake news** specially in times of social emergencies.

- Alarmist, misleading shorter messages and anecdotal evidence seems to have an stronger impact on the spread of health related misinformation on epidemiological topics. They might derive in risky behaviours.

- Opinion **polarization** due to the online community structure.

Challenges

- Better understanding **how misinformation may propagate**.

  - Principal actors

  - Degree of connectivity of the users.

  - Topological configuration of the SN.

- Measures of the **prevalence of health misinformation** in social media.

- Analysis of the **influence** between exposure to health related misinformation and health behaviors. and outcomes.

- Measures to **detect and reduce** the spreading and exposure to health misinformation **in real time.**

  - Dissemination of accurate information in a timely way.

Opportunities

Social networks as a source of information

- Social media has a crutial role in **people's perception of disease exposure**, resultant decision making and risk behaviours.

- "**Behavioural insights** are valuable to inform the planning of appropriate pandemic response measures". (Hans Kluge (2020), WHO Regional Director for Europe)

- Information on public awareness, opinions, attitudes and beliefs, relevant to intentions and eventual behaviours.

- **Real time communication :**

- Shorter messages have been found effective for promoting peoples health specifically in vaccinations campaigns.

- Twitter fast to propagate evidence based knowledge on health.