



185 - HOW HEALTH MISINFORMATION SPREADS: INTEGRATING EVIDENCE FROM SURVEY DATA AND AGENT-BASED MODELING

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Resumen

Background/Objectives: Health misinformation has emerged as a major public health challenge during the COVID-19 pandemic, yet evidence on its social diffusion mechanisms and behavioral implications remains limited. This study aims to analyze the collective dynamics of health misinformation by integrating representative survey data with agent-based modeling, in order to identify structural and social drivers of misinformation spread and their implications for health decision-making.

Methods: A cross-sectional telephone survey was conducted in Spain between January and March 2024 ($n = 2,200$), using stratified multistage sampling to ensure representativeness by age, sex, region, and population size. Misinformation beliefs were assessed using the 12-item COVID-19 Misinformation Scale (CMS12), based on false or misleading claims identified by national fact-checking platforms. Exploratory factor analysis identified four dimensions (Conspiracy, Hoaxes, Vaccines, Fertility), and k-means clustering classified respondents into three profiles: Informed, Hesitant, and Misinformed. These empirical profiles were used to parameterize an agent-based model simulating opinion dynamics across four network structures (regular, random, small-world, scale-free), varying learning rates, resistance to opinion change, and network size.

Results: Survey findings showed that although most respondents rejected misinformation claims, a substantial proportion endorsed or remained uncertain about vaccine-related narratives, including sudden deaths attributed to vaccines (40.4%) and the perceived lack of necessity of booster doses (24.8%). Cluster analysis identified 49% Informed, 30% Hesitant, and 21% Misinformed individuals. Across all simulations, scale-free networks were the most vulnerable to misinformation diffusion due to highly connected hubs, while small-world networks sustained misinformation within local clusters. Hesitant agents consistently emerged as the main drivers of opinion change, acting as a bridge between informed and misinformed groups under repeated exposure.

Conclusions/Recommendations: Health misinformation dynamics are strongly shaped by both network topology and individual susceptibility to social influence. While misinformed groups tend to hold stable, ideologically entrenched positions, hesitant individuals represent a key leverage point for intervention. Public health strategies should prioritize targeted communication and prevention campaigns aimed at hesitant populations, particularly within highly interconnected social environments.

Funding: This work is part of project NETDYNAMIC (CNS2022-135907), funded by MCIN/AEI/10.13039/501100011033 and by the European Union “Next Generation EU”/PRTR.