CONTEMPORARY VACCINE HESITANCY IN THE FACE OF THE ADVANCE OF VACCINE-PREVENTABLE DISEASES: IMPACTS OF SCIENTIFIC MISINFORMATION, DIGITAL MEDIA, AND THE LOSS OF PUBLIC TRUST ON HERD IMMUNITY AND GLOBAL HEALTH

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Paula Dittrich Corrêa[1], Claudinei Ferro Souza[2], Herion Alves da Silva Machado[3], Cristiane Eugênio de Santana[4], Rayra Annara da Fonseca Otacílio Pinto[5], Erica do Socorro Oliveira Souza[6] and Jaqueline Fátima Previatti Veiga[7]

Abstract

Contemporary vaccine hesitancy has become a major challenge for global public health, particularly in light of the resurgence of vaccine-preventable diseases that were previously under control. This study aimed to analyze the impacts of scientific misinformation, the influence of digital media, and the decline in public trust on vaccine adherence and its consequences for herd immunity and global health. The methodology consisted of a narrative literature review based on studies by recognized authors in the fields

[1] Bachelor's Degree in Nursing and Obstetrics
Univali – Itajaí, SC
Bachelor's Degree in Law
IBES – Blumenau, SC – Master's Degree: Regional Development
FURB – Blumenau, SC
Blumenau, SC
E-mail: paulinha.dittrich.correa@gmail.com
ORCID: https://orcid.org/0009-0000-1194-5286
[2] Social Work
Uniderp Anhanguera
Campo Grande, MS
E-mail: Claudineiferro@hotmail.com
ORCID: https://orcid.org/0009-0006-5730-4031
[3] Infectious Disease Physician
Master's Degree in Tropical Medicine
Federal University of Piauí, Teresina-Piauí
E-mail: herioninfecto@gmail.com
[4] Public Health Management, Postgraduate Studies in Patient Safety and Quality Management
E-mail: corepapel2@gmail.com
[5] Bachelor's Degree in Biomedicine,
Master's Degree in Biological Sciences and Specialist in Microbiology
Federal University of Alfenas – MG
E-mail: annara.rayra@bol.com.br
[6] Nurse
State University of Pará
E-mail: ericaoliv@yahoo.com.br
[7] Nurse
Mafra SC
E-mail: Jaquelinejfpv@gmail.com

of immunization, health communication, and social behavior, published in national and international scientific databases. The results demonstrated that the rapid spread of false information through digital environments, combined with anti-vaccine content and limited scientific literacy, significantly contributes to increasing vaccine insecurity. Furthermore, sociocultural, political, and institutional factors influence risk perception and public trust in immunization programs. It is concluded that vaccine hesitancy is a multifactorial phenomenon that compromises vaccination coverage, promotes the reemergence of vaccine-preventable diseases, and threatens collective protection. Integrated strategies based on health education, accessible scientific communication, and strengthening social trust are essential for preserving global public health.

Keywords: Herd immunity, Digital media, Scientific misinformation, Vaccine hesitancy, Vaccine-preventable diseases.

INTRODUCTION

Vaccination is recognized as one of the most effective public health interventions, being responsible for the significant reduction of morbidity and mortality related to infectious diseases and for the eradication or control of several illnesses throughout history. Large-scale immunization programs have enabled substantial advances in the life expectancy and quality of life of populations, consolidating vaccines as fundamental tools for individual and collective protection. However, in recent decades, there has been an increase in a complex phenomenon known as vaccine hesitancy, characterized by delay in or refusal of vaccination even when services are available (Macdonald, 2015).

Contemporary vaccine hesitancy has become a highly relevant public health problem due to the increased circulation of false information, the rapid dissemination of content lacking scientific basis in digital environments, and the weakening of social trust in scientific and governmental institutions. The expansion of social networks has broadened access to information, but it has also favored the spread of misleading content that influences perceptions, beliefs, and behaviors related to vaccination. According to

the World Health Organization, vaccine hesitancy was included among the main threats to global health because of its potential impact on vaccination coverage and the reemergence of previously controlled diseases (WHO, 2019).

In this context, the following research problem is defined: in what way does scientific misinformation, associated with digital media and the loss of public trust, influence contemporary vaccine hesitancy and contribute to the advance of vaccine-preventable diseases and the weakening of herd immunity?

The general objective of this study is to analyze the impacts of scientific misinformation, digital media, and the loss of public trust on contemporary vaccine hesitancy and its repercussions for herd immunity and global health. As specific objectives, the study seeks to understand the factors associated with the increase in vaccine hesitancy; investigate the influence of digital platforms on the spread of disinformative content; identify the impacts of reduced vaccination coverage; and discuss strategies to strengthen social trust and promote adherence to vaccines.

The relevance of this study is justified by the growing reduction in vaccination coverage rates observed in several countries, including Brazil, associated with the reemergence of vaccine-preventable diseases such as measles and pertussis. Studies indicate that maintaining high vaccination coverage is essential for preserving herd immunity and protecting more vulnerable individuals (Fine; Eames; Heymann, 2011). In this sense, understanding the determinants of vaccine hesitancy is indispensable for supporting more effective public policies and educational strategies.

From a theoretical perspective, vaccine hesitancy is understood as a multifactorial phenomenon influenced by factors related to trust, convenience, and risk perception, known as the “3Cs” model — confidence, complacency, and convenience (Macdonald, 2015). In addition, authors such as Larson et al. (2014) emphasize that public confidence in vaccines is strongly influenced by cultural, political, and communicational aspects. At the same time, the phenomenon of the “infodemic,” characterized by an excess of information, including incorrect or false content, has become a contemporary challenge for

public health, making it difficult to identify reliable scientific evidence and contributing to the expansion of vaccine insecurity (Zarocostas, 2020).

Thus, discussing vaccine hesitancy in the current scenario of intense circulation of digital information is essential for understanding the impacts of misinformation on collective health and for strengthening strategies aimed at promoting trust in science and in immunization programs.

METHODOLOGY

RESEARCH DESIGN

The present study is characterized as research with a qualitative approach, descriptive and exploratory in nature, developed through a narrative review of the scientific literature. This type of methodology enables a broader understanding of complex and multifactorial phenomena, allowing the integration of knowledge produced in different contexts and theoretical perspectives. According to Gil (2019), exploratory research aims to provide greater familiarity with a given problem, contributing to its understanding and analytical deepening. The choice of a narrative review is justified by the need to analyze contemporary vaccine hesitancy across different dimensions — scientific, social, cultural, and communicational — considering the complexity of the interactions among misinformation, digital media, public trust, and collective health.

Procedures for searching and selecting studies

Data collection was carried out through a bibliographic survey in national and international scientific databases widely recognized in the health field, including the Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature in Health Sciences (LILACS), PubMed, and the Virtual Health Library (VHL). Descriptors indexed in the Health Sciences Descriptors (DeCS) and in Medical Subject Headings (MeSH) were used, combined through the Boolean operators AND and OR.

The main terms used were: “vaccine hesitancy,” “scientific misinformation,” “digital media,” “immunization,” “vaccination,” “herd immunity,” and “global health,” in addition to their corresponding versions in Portuguese: “hesitação vacinal,” “desinformação científica,” “mídias digitais,” “imunização,” “imunidade coletiva,” and “saúde global.” As inclusion criteria, scientific articles, institutional documents, systematic reviews, and studies published in Portuguese, English, and Spanish were selected, provided they were fully available and related to the proposed topic. Publications from the last ten years were preferably included, as well as classic studies considered fundamental to the theoretical discussion of the topic. As exclusion criteria, duplicate studies, publications without direct relevance to the object of study, and materials lacking scientific support were eliminated.

ANALYSIS TECHNIQUES AND INSTRUMENTS

The instrument used to obtain information was a bibliographic analysis protocol containing: identification of the authors, year of publication, study objective, methodology applied, main results, and contributions to the understanding of vaccine hesitancy.

Subsequently, an exploratory, selective, and analytical reading of the collected material was carried out. According to Marconi and Lakatos (2021), bibliographic analysis makes it possible to critically examine different perspectives on a given phenomenon, promoting the systematization of existing scientific knowledge. The data obtained were organized into thematic categories, including: factors associated with vaccine hesitancy; influence of digital media; scientific misinformation; impacts on herd immunity; and repercussions for global health.

METHODOLOGICAL FOUNDATION AND DISCUSSION

The choice of a qualitative approach is grounded in the need to understand subjective and sociocultural elements that interfere with decision-making related to vaccination. According to Minayo

(2014), qualitative research works with meanings, values, beliefs, and interpretations present in social relations, being particularly relevant to studies in collective health.

The literature demonstrates that vaccine hesitancy cannot be explained exclusively by biomedical factors, since it involves behavioral, political, and communicational aspects. MacDonald (2015) emphasizes that confidence in vaccines constitutes one of the main determinants of vaccine adherence, while Larson et al. (2014) show that cultural factors and the circulation of information directly influence public perception regarding the safety and efficacy of vaccines. In addition, the growth of digital platforms has transformed the way the population accesses health-related content. According to Zarocostas (2020), the so-called “infodemic” has intensified the spread of false information, making it more difficult to identify reliable scientific evidence. Thus, the methodology adopted enables a critical and comprehensive analysis of the factors involved in contemporary vaccine hesitancy, favoring the understanding of current challenges for global public health.

RESULTS AND DISCUSSION

The analysis of the literature showed that contemporary vaccine hesitancy constitutes a complex, multifactorial phenomenon strongly influenced by sociocultural, political, and communicational factors. The studies reviewed demonstrated that the reduction of trust in health institutions, the circulation of false information, and the growth of digital media have significantly modified the population’s relationship with immunization programs. Unlike previous periods, when low vaccine adherence was often associated with limited access to health services, it is currently observed that part of the resistance to vaccination is related to subjective risk perception and the credibility attributed to information sources.

According to MacDonald (2015), vaccine hesitancy is not limited to the simple refusal of vaccines, but includes delays, doubts, and intermediate behaviors influenced by diverse factors. The “3Cs” model — confidence, complacency, and convenience — has become an international reference for understanding the determinants of vaccine adherence. Confidence refers to credibility in vaccines and in

the institutions responsible for them; complacency relates to a low perception of disease risks; and convenience is associated with the accessibility of services.

In this context, it was found that the "confidence" component has shown significant weaknesses in the contemporary scenario marked by the intense circulation of digital information. Studies indicate that the growth of anti-vaccine content and the spread of fake news increase uncertainty and contribute to decisions based on personal perceptions to the detriment of scientific evidence (Larson et al., 2014).

Table 1

Main factors associated with vaccine hesitancy identified in the literature

Identified factors	Description	Possible impacts
Scientific misinformation	Dissemination of false content or content without scientific evidence	Reduction of trust and increase in insecurity
Digital media	Accelerated sharing of information and fake news	Expansion of anti-vaccine discourses
Low risk perception	Belief that vaccine-preventable diseases have been eradicated	Decrease in vaccine adherence
Sociocultural aspects	Religious, political, and cultural influences	Resistance to vaccination
Reduced institutional trust	Discredit toward governments and health systems	Decline in vaccination coverage

Source: Prepared by the author (2026).

The findings demonstrated that scientific misinformation stands out as one of the most relevant factors in strengthening vaccine hesitancy. The expansion of digital platforms has promoted greater democratization of access to information; however, at the same time, it has facilitated the circulation of content without scientific validation. In recent years, social networks have come to play a central role in shaping opinions related to health.

According to Zarocostas (2020), the phenomenon known as the "infodemic" corresponds to the excess of available information, including incorrect, contradictory, or false content, making it difficult to identify reliable evidence. During health crises, such as the COVID-19 pandemic, this process became even more evident, producing significant impacts on public perception of vaccine safety.

In addition, studies show that false information has greater potential for dissemination in digital environments due to its emotional appeal, sensationalism, and ability to generate engagement. Consequently, individuals repeatedly exposed to disinformative content may develop greater mistrust of vaccines and scientific institutions.

Table 2

Main impacts of misinformation on vaccination

Aspects analyzed	Observed consequences
Circulation of fake news	Dissemination of fear and insecurity
Anti-vaccine content	Reduction of vaccination intention
Pseudoscientific information	Confusion between evidence and opinions
Excess of information	Difficulty identifying reliable sources
Digital polarization	Reinforcement of resistant beliefs and behaviors

Source: Prepared by the author (2026).

Another aspect observed concerns the relationship between reduced vaccination coverage and the reemergence of vaccine-preventable diseases. Studies show that high vaccination rates are fundamental for maintaining herd immunity, a mechanism responsible for the indirect protection of unvaccinated or more vulnerable individuals (Fine; Eames; Heymann, 2011).

When vaccination coverage decreases, population groups become susceptible to the circulation of previously controlled infectious agents. This situation has been observed in different countries, including Brazil, especially in recent episodes involving an increase in measles cases.

Table 3

Relationship between declining vaccination coverage and public health consequences

Observed situation	Consequence for collective health
Reduction in vaccination coverage	Weakening of herd immunity
Increase in vaccine hesitancy	Greater number of susceptible individuals
Return of vaccine-preventable diseases	Growth of epidemiological outbreaks
Reduction of social trust	Difficulty in future campaigns
Circulation of misinformation	Compromise of preventive actions

Source: Prepared by the author (2026).

The analysis also revealed that public trust represents a central element in vaccine acceptance. Larson et al. (2014) argue that trust is built through historical, cultural, and institutional factors and is directly influenced by the relationship among society, science, and public policies. When this relationship weakens, there is an increase in doubts related to the safety, efficacy, and necessity of vaccination.

Another relevant factor refers to the change in the epidemiological profile of vaccine-preventable diseases. The historical success of immunization programs significantly reduced the incidence of several diseases, leading part of the population to underestimate their risks. This phenomenon is described by MacDonald (2015) as vaccine complacency, a situation in which reduced perception of disease severity decreases motivation for vaccine adherence.

The discussion of the results makes it possible to understand that vaccine hesitancy goes beyond exclusively biomedical factors. Psychological, social, technological, and political aspects act in an integrated manner, requiring equally multidimensional responses. Strategies centered only on making vaccines available prove insufficient in the face of the complexity of the problem.

Thus, the results analyzed suggest the need to strengthen scientific literacy, expand health communication policies, and develop digital strategies capable of combating misinformation. In addition, the reconstruction of social and institutional trust emerges as an indispensable element for preserving herd immunity and reducing risks associated with the advance of vaccine-preventable diseases.

CONCLUSION

The present research aimed to analyze the impacts of scientific misinformation, digital media, and the loss of public trust on contemporary vaccine hesitancy, as well as to understand its repercussions for herd immunity and global health. Specifically, it sought to identify the factors associated with the increase in vaccine hesitancy, investigate the influence of digital platforms on the dissemination of disinformative content, analyze the impacts of reduced vaccination coverage, and discuss strategies aimed at strengthening social trust in vaccination.

The results showed that vaccine hesitancy constitutes a multifactorial phenomenon, influenced by social, cultural, political, and communicational aspects. It was observed that the widespread dissemination of false information and pseudoscientific content in digital environments plays a significant role in the formation of mistaken perceptions regarding vaccine safety and efficacy. In addition, it was found that reduced trust in scientific and governmental institutions and in health systems represents a determining factor in the increase of vaccine insecurity.

The findings also demonstrated that declining vaccination coverage favors the weakening of herd immunity and increases the risk of reemergence of previously controlled vaccine-preventable diseases. The literature analyzed revealed that maintaining high vaccination rates is essential for individual and collective protection, especially among more vulnerable groups, such as children, older adults, and immunosuppressed individuals.

As a scientific contribution, this study enabled the integration of different theoretical perspectives related to vaccine hesitancy, offering a broader understanding of the mechanisms that influence the population’s decision-making regarding vaccination. The research reinforces the need for interdisciplinary approaches capable of articulating knowledge from public health, communication, education, and the social sciences in order to confront this contemporary challenge.

Furthermore, the results highlight the importance of strengthening public policies aimed at health education, the promotion of scientific literacy, and the development of more accessible and effective

communication strategies. Investments in educational campaigns based on scientific evidence and adapted to new digital dynamics can contribute significantly to increasing public trust and vaccine adherence.

Finally, it is suggested that future research investigate the impact of social media algorithms on the spread of health misinformation, as well as the effectiveness of digital interventions in addressing vaccine hesitancy. The development of field studies and quantitative research is also recommended in order to analyze regional, cultural, and socioeconomic differences related to vaccination behavior, broadening the understanding of the determinants of this phenomenon and supporting more targeted strategies for the promotion of global health.

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