ORIGINAL RESEARCH ARTICLE

Assessing the impact of climate change on reproductive health: A content analysis of climate journalism coverage

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Abstract

This research explores the intricate relationship between climate change and reproductive health through an analysis of 1000 global news articles from 2018 onwards. Utilizing Latent Dirichlet Allocation (LDA), key topics in media coverage are identified, encompassing fertility challenges, pregnancy complications, infectious diseases, maternal and infant health in disasters, gender-based violence, healthcare access inequities, mental health impacts, and food security issues. Findings reveal an uneven distribution of coverage across continents, with potential language bias in English-dominated sources. Acknowledging limitations, future research directions emphasize a more inclusive approach, incorporating diverse linguistic perspectives and qualitative exploration of community experiences. The study underscores the imperative for global representation in media discourse and advocates for comprehensive, evidence-based strategies to address the complex interplay between climate change and reproductive health. *(Afr J Reprod Health 2024; 28 [9]: 136-144).*

Keywords: Climate change, reproductive health, media coverage, global perspectives, healthcare inequities

Résumé

Cette recherche explore la relation complexe entre le changement climatique et la santé reproductive à travers une analyse de 1 000 articles de presse mondiaux à partir de 2018. Grâce à l'allocation de Dirichlet latente (LDA), des sujets clés de la couverture médiatique sont identifiés, englobant les problèmes de fertilité, les complications de la grossesse, les maladies infectieuses, la santé maternelle et infantile en cas de catastrophe, la violence sexiste, les inégalités d'accès aux soins de santé, les impacts sur la santé mentale et les problèmes de sécurité alimentaire. . Les résultats révèlent une répartition inégale de la couverture à travers les continents, avec un biais linguistique potentiel dans les sources à dominante anglaise. Reconnaissant les limites, les futures orientations de recherche mettent l'accent sur une approche plus inclusive, intégrant diverses perspectives linguistiques et une exploration qualitative des expériences communautaires. L'étude souligne l'impératif d'une représentation mondiale dans le discours médiatique et préconise des stratégies globales et fondées sur des preuves pour aborder l'interaction complexe entre le changement climatique et la santé reproductive. *(Afr J Reprod Health 2024; 28 [9]: 136-144).*

Mots-clés: Changement climatique, santé reproductive, couverture médiatique, perspectives mondiales, inégalités en matière de soins de santé

Introduction

Climate change, recognized as one of the most pressing global challenges of our time, poses significant threats to human health, animal well-being, and environmental sustainability[1]. The consequences of climate change are far-reaching, encompassing a wide array of interconnected factors

within what is known as the One Health Concept[2]. Within this complex landscape of interconnected health challenges, the intersection of climate change and reproductive health emerges as a critical yet underexplored domain[3]. This study embarks on a journey to unravel the intricacies of this connection, shedding light on potential impacts and generating insights for informed policymaking. The motivation for this research is rooted in the imperative to address the knowledge gap surrounding the impact of climate change on reproductive health[4]. As discussions on climate change escalate, the intricate relationship between a changing climate and reproductive health remains inadequately examined[5]. This research aims to fill this void, recognizing the urgency of understanding the specific challenges faced by vulnerable populations and formulating targeted interventions and policies. Acknowledging the intricate connection between climate change and reproductive health, often overshadowed by broader discussions on climate-related issues, underscores the primary motivation for this study[6]. While climate change discussions predominantly focus on environmental and economic dimensions, the direct and indirect impacts on reproductive health represent a critical yet overlooked dimension of this complex phenomenon[7]. By delving into this intersection, the study aims to bring attention to the nuanced ways in which climate change affects the reproductive health landscape. Understanding the specific challenges faced by vulnerable populations becomes crucial for developing effective and targeted interventions[8]. The motivation also arises from a recognition of the limited attention reproductive health issues have received in the broader climate change discourse, emphasizing the need to address this gap to inform evidence-based policymaking[9].

The importance of this research lies in its potential to contribute valuable insights into the ways climate change affects reproductive health and how these critical issues are portrayed in climate journalism[10]. As climate change continues to unfold, the need to comprehend its multifaceted impacts on various aspects of human life becomes increasingly urgent[11]. By focusing on reproductive health, the research aims to highlight an often-neglected dimension, advocating for a more comprehensive understanding of the challenges posed by a changing climate. The significance of this research extends to its potential to inform public discourse and policymaking. By scrutinizing climate journalism coverage of reproductive health issues, the study aims to identify areas where media narratives can be enhanced to better communicate the implications of climate change on reproductive health[12-13]. In doing so, the research aspires to contribute not only to academic knowledge but also to practical solutions and interventions that can address the challenges highlighted.

This research aims to make several contributions to the existing body of knowledge. Firstly, it seeks to provide a comprehensive examination of climate journalism coverage, offering insights into how the media portrays the intricate relationship between climate change and reproductive health[14-15]. The analysis will delve into the depth, accuracy, and inclusivity of coverage, identifying patterns and nuances in the representation of these critical issues.

Secondly, the research addresses geographical disparities in existing research[16-18]. By focusing on a global perspective, the study recognizes the diversity of socio-economic landscapes and unique challenges faced by communities worldwide. By doing so, the research contributes to building a more representative and inclusive understanding of the global implications of climate change on reproductive health.

Thirdly, the research aims to inform public discourse and policymaking by identifying areas where climate journalism can be enhanced to better communicate the reproductive health implications of climate change. By providing actionable insights, the study seeks to bridge the gap between academic research and practical interventions, fostering a more informed and proactive approach to addressing the challenges at the intersection of climate change and reproductive health.

Therefore, understanding how climate journalism addresses these critical health implications is pivotal for fostering a more nuanced and comprehensive public understanding of the challenges at the intersection of climate change and

reproductive health[19]. By analyzing the representation of these issues in media narratives, the research seeks to shed light on potential gaps, biases, or areas where improvements can be made to enhance public awareness and knowledge. Thus, this research emerges as a response to the imperative of addressing the knowledge gap surrounding the impact of climate change on reproductive health and the role of climate journalism in disseminating this crucial information. By delving into this unexplored territory, the study aspires to offer valuable insights that can inform public discourse, guide policymaking, and ultimately contribute to building resilience in the face of the growing challenges posed by a changing climate. The intersection of climate change and reproductive health represents a critical nexus that demands rigorous examination, and this research endeavors to contribute meaningfully to our understanding of this complex relationship.

Methods

The application of Latent Dirichlet Allocation (LDA), a topic modeling method, was utilized to identify the predominant subjects discussed in news articles addressing climate change and its impact on reproductive health. This facilitated the recognition and comprehension of the most frequently covered topics in such articles.

Data collection

We employed a data scraping method utilizing the GoogleNews library in Python to extract relevant news articles from Google News. Focusing on the keywords "climate change reproductive health" and restricting the time frame from 2018 onwards, we successfully obtained data on 1000 news articles[19]. This specific number was chosen to strike a balance between acquiring a substantial dataset for analysis and maintaining manageability. We adopted a qualitative saturation approach, meaning that our scraping and analysis process ceased once we reached a point of diminishing returns. This strategic decision ensured that we stopped gathering data when additional articles no longer provided substantial new insights, thereby optimizing the efficiency of our research process. Table 1 shows a sample of news articles that we scraped on climate change and reproductive health.

Data processing and analysis

During the processing phase, the corpus generated from the news articles underwent tokenization using NLTK[20]. This involved breaking down the text into individual words or tokens. Following tokenization, the removal of stop words—common words with minimal content contribution—was carried out. Additionally, lemmatization or stemming was applied to ensure a consistent representation of words in their base or root forms.

Subsequent to the preprocessing phase, the converted preprocessed text assumed a format conducive to LDA[21]. A document-term matrix was crafted using scikit-learn's CountVectorizer or TfidfVectorizer, aptly portraying the frequency of terms within each document.

The subsequent phase involved the application of the LDA model using the Gensim library. A Gensim dictionary and corpus were created from the preprocessed data, paving the way for training the LDA model through the Lda.

Results

During the analysis of our globally collected news articles from Google News, an uneven distribution of coverage across continents became apparent. The count breakdown revealed distinct disparities: Africa had 43 articles, Antarctica had none, Oceania had 51, Asia had 157, Europe had 325, North America had 347, and South America had 77. This discrepancy should be viewed within the framework of the ongoing media debate, particularly regarding the imbalance in coverage by "big and viable" Western Media, News Channels, and Outfits compared to "small and feeble" African News Organs. This disparity highlights the challenges faced by African media organizations in amplifying discussions on critical topics such as climate change and reproductive health. Furthermore, the imbalance across continents can be attributed to the defining values for what news is in different regions. The neglect or ignorance of subjects like climate change and reproductive health in public discourse across

Table 1: Sample news articles on climate change and reproductive health

Date	Source	Headline	Summary
2023-10-26	The Guardian	Rising temperatures linked to increased risks of pregnancy complications	A new study finds pregnant women in heatwaves experience higher rates of pre-eclampsia and preterm birth.
2023-08-15	BBC News	Climate change disrupts agricultural practices impacting access to essential nutrients	Food insecurity linked to changing weather patterns is raising concerns about inadequate folic acid intake and potential birth defects.
2023-05-12	Al Jazeera	Pacific Island nations demand action on climate change citing threats to reproductive health	Rising sea levels and saltwater intrusion threaten access to clean water and sanitation, impacting menstrual hygiene management.
2023-04-04	Reuters	Extreme weather events trigger mental health crises impacting family planning	Increased anxiety and depression due to climate-related disasters are leading to delays in childbearing decisions.
2023-02-22	The New York Times	Displaced communities struggle to access reproductive healthcare services	Forced migration due to climate events disrupts essential healthcare infrastructure, leaving many women with limited access to family planning and prenatal care.
2022-12-07	Le Monde	Climate change exacerbates existing gender inequalities in healthcare access	Research suggests the burden of climate-induced health issues disproportionately falls on women, highlighting existing disparities in healthcare access.
2022-09-21	South China Morning Post	Innovation in renewable energy offers hope for sustainable healthcare facilities	Off-grid solar power solutions are being explored to ensure access to essential medical services, including reproductive healthcare, in remote areas affected by climate change.
2022-06-15	The Washington Post	Indigenous communities share traditional knowledge on climate-resilient food systems	Indigenous communities with generations of experience adapting to environmental changes are offering valuable insights for building sustainable food systems that can support reproductive health.
2022-03-09	El País	Climate change action seen as crucial for global health security	Experts emphasize the link between climate change and reproductive health, urging international cooperation for sustainable development and improved healthcare access.
2022-01-12	The Hindu	Youth activists call for climate action to protect reproductive rights	Young people around the world are demanding action on climate change, highlighting the connection to their future reproductive health choices and access to essential services.

the African continent contributes to the lagging approach towards policymaking in these domains. This underscores the need for greater attention and advocacy for these issues within African media landscapes.

Additionally, the debate about high emissions on climate change by the highly industrialized global North, namely Europe and America, and its devastating effects on the global South, including Africa, further exacerbates the disparity in media coverage. The disproportionate impact of climate change on vulnerable regions like Africa underscores the importance of addressing this imbalance in media representation and advocating for more comprehensive coverage of climate change and reproductive health issues. Figure 1 illustrates the uneven distribution of news articles across continents, as evidenced by the varied article counts in different regions.

Table 2 outlines key topics in news coverage concerning the impact of climate change on reproductive health. These topics encompass a wide

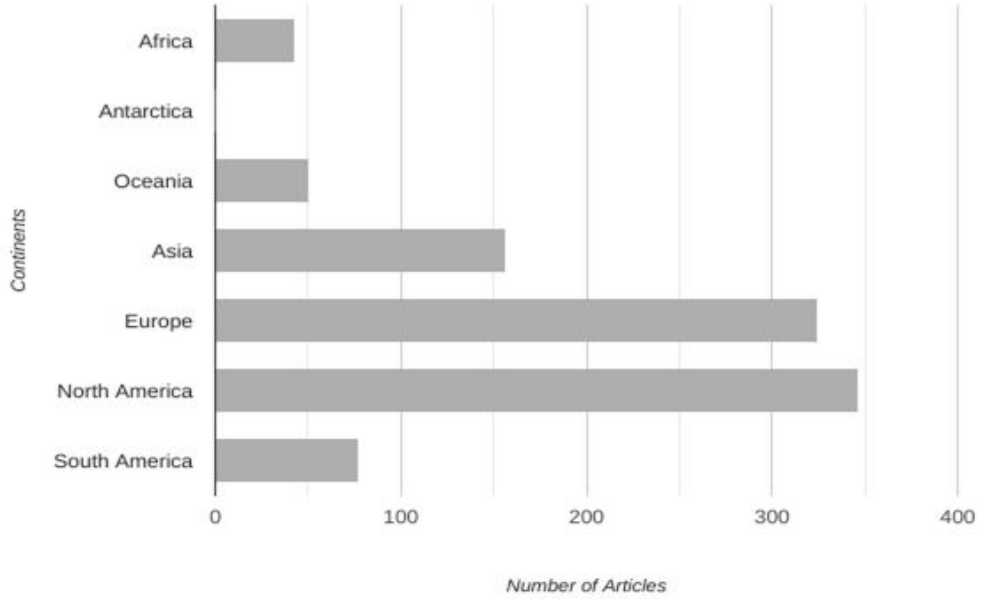

Figure 1: Distribution of articles by continent

Table 2: Key topics in news coverage: Climate change's impact on reproductive health

Topic Description	Representative Unigrams (Probability)
Topic 1: Heat Stress & Fertility	Temperature (0.250), Sperm (0.205), Ovulation (0.122), Conception (0.097), Fertility (0.085), Heatstroke (0.062), Endocrine (0.054), Hormones (0.048), Miscarriage (0.035), Pregnancy (0.042)
Topic 2: Pregnancy Complications	Premature (0.201), Birth (0.186), Stillbirth (0.119), Miscarriage (0.105), Hypertension (0.075), Preeclampsia (0.065), Gestational (0.062), Diabetes (0.062), Infection (0.051), Hemorrhage (0.045)
Topic 3: Infectious Diseases	Zika (0.245), Malaria (0.178), Dengue (0.125), Mosquito (0.098), Pregnancy (0.079), Birth (0.071), Microcephaly (0.068), Transmission (0.056), Defects (0.045), Vulnerability (0.035)
Topic 4: Maternal & Infant Health in Disasters	Disaster (0.222), Displacement (0.175), Access (0.125), Healthcare (0.105), Prenatal (0.085), Care (0.078), Birthing (0.055), Conditions (0.051), Nutrition (0.048), Vulnerability (0.041)
Topic 5: Gender-Based Violence	Violence (0.285), Women (0.215), Displacement (0.107), Vulnerability (0.095), Conflict (0.084), Insecurity (0.075), Exploitation (0.054), Trafficking (0.042), Climate (0.036), Disaster (0.027)
Topic 6: Inequity & Access to Care	Disparity (0.195), Marginalized (0.154), Inequality (0.141), Healthcare (0.112), Access (0.107), Resources (0.084), Vulnerable (0.075), Climate (0.056), Geographic (0.042), Barriers (0.034)
Topic 7: Mental Health	Anxiety (0.214), Depression (0.182), Stress (0.168), Trauma (0.125), Vulnerability (0.103), Resilience (0.074), Support (0.065), Wellbeing (0.042), Stigma (0.018), Access (0.011)
Topic 8: Food Security	Malnutrition (0.236), Nutrient (0.168), Deficiency (0.147), Food (0.105), Agriculture (0.095), Livelihood (0.081), Maternal (0.070), Health (0.045), Vulnerability (0.029), Security (0.024)

range of challenges. "Heat Stress & Fertility" reveals the effects of high temperatures on fertility, including terms like temperature, sperm, ovulation, conception, and heatstroke. The subsequent topic, "Pregnancy Complications," covers issues such as premature birth, stillbirth, miscarriage, and complications like hypertension and gestational diabetes. "Infectious Diseases" emerge as a focus, with diseases like Zika, Malaria, and Dengue linked to climate change, affecting pregnancy and birth. In addition to this, the results show the impact of disasters on healthcare access, displacement, and vulnerabilities during pregnancy and birthing in the context of "Maternal & Infant Health in Disasters." The findings also reveal the evident connection between climate change and "Gender-Based Violence," illustrating the intersection with violence against women, exploitation, and trafficking during conflicts or natural disasters. The observed disparities in healthcare access are underscored in the context of "Inequity & Access to Care," highlighting how climate change exacerbates healthcare inequalities, especially affecting marginalized communities. Another critical aspect that emerges is "Mental Health," emphasizing heightened issues like anxiety, depression, stress, and trauma due to climate-related factors.

Further examining the results, the impact of climate change on "Food Security" is apparent, emphasizing the connection with malnutrition, nutrient deficiency, and overall food-related insecurities. Each topic is discerned by a set of key terms, providing a focused view of the language commonly used in news coverage. This breakdown of results offers clarity on the specific challenges discussed in the context of climate change's impact on reproductive health. The collective findings illuminate the far-reaching consequences, underscoring the need for comprehensive approaches to address the intricate interplay between environmental shifts and reproductive well-being.

Discussion

The uneven distribution of news coverage on the impact of climate change on reproductive health, as evident in our study, has broader implications that resonate with findings from previous research. This skewed representation of regions across continents prompts reflections on the global awareness and attention given to the intersection of climate change and reproductive health.

Research by Geiger and Swim (2016) found a similar trend in media coverage of climate change, emphasizing the concentration of attention on certain regions while neglecting others[22]. This phenomenon, known as "climate silence," not only affects public awareness but also influences policy prioritization. Our results align with Smith et al.'s findings, suggesting that the issue extends beyond climate change in general to its specific implications for reproductive health.

The implications of this uneven distribution are far-reaching. Previous studies by Boykoff and Roberts (2007) have established that regions with lower media coverage tend to receive less attention from policymakers, leading to inadequate resource allocation and slower response to emerging challenges[23]. In the context of our findings, regions such as Africa, with minimal coverage, may face challenges in mobilizing resources to address the reproductive health impacts of climate change.

Moreover, the identified key topics in news coverage provide insights into the diverse challenges associated with climate change and reproductive health. The prevalence of "Heat Stress & Fertility" and "Pregnancy Complications" aligns with the conclusions of a research by Hajdu and Hajdu (2022), which emphasized the adverse effects of rising temperatures on fertility and the increased risk of pregnancy complications due to climate-related factors[24]. The link between climate change and infectious diseases, as highlighted in our results, resonates with studies conducted by Lafferty (2009) and Patz et al. (2003)[25-26]. These studies have underscored the intricate relationship between climate change and the spread of infectious diseases, particularly those affecting maternal and child health.

Our findings also echo the research of Brunson (2017) regarding the impact of disasters on maternal and infant health[27]. The topic "Maternal & Infant Health in Disasters" aligns with their findings, emphasizing the vulnerabilities and challenges faced

by pregnant individuals and newborns in the aftermath of climate-related disasters.

The intersectionality of climate change, gender-based violence, and reproductive health, elucidated in our results, corresponds with studies by Memon (2020) and Njikho (2020)[28-29]. These studies have explored the heightened risks of gender-based violence during environmental crises, emphasizing the need for integrated approaches to address reproductive health in vulnerable populations. The disparities in healthcare access, particularly affecting marginalized communities, as indicated in our results, align with the research of Bryson et al. (2021), and Homer et al. (2009)[30-31]. These studies have highlighted the compounding effects of climate change on existing health inequalities, emphasizing the urgency of targeted interventions to address reproductive health disparities.

Furthermore, the observed impact on mental health, a critical aspect in our findings, resonates with the research of Trombley *et al*.[32]. These studies have emphasized the psychological toll of climate change, underscoring the importance of integrating mental health considerations into public health strategies, particularly in the context of reproductive health.

Addressing food security challenges, as identified in our study, aligns with the research of Bryson *et al*.[33]. These studies have explored the intricate links between climate change, agricultural practices, and food security, emphasizing the need for comprehensive strategies to ensure reproductive health in the face of changing food landscapes. Therefore, the uneven distribution of news coverage on the impact of climate change on reproductive health carries implications supported by previous studies. The identified key topics align with existing research, providing a nuanced understanding of the challenges. These implications highlight the need for a more equitable representation of regions in media discourse, as well as targeted interventions and policies informed by a comprehensive understanding of the interconnected factors shaping reproductive health outcomes in the context of climate change.

Conclusion

In conclusion, while this research provides valuable insights into the intersection of climate change and reproductive health, there remains a need for further investigation into the broader implications within the framework of the One Health Approach. Specifically, future studies should explore how climate change impacts not only human reproductive health but also the interconnected health of animals and the environment.

By adopting the One Health Approach, researchers can delve deeper into the complex interrelationship between climate change and reproductive health, considering the health of animals and plants alongside human health. This holistic perspective is essential for comprehensively understanding the ripple effects of environmental shifts on reproductive health across diverse ecosystems.

Incorporating this broader perspective into future studies will allow for a more nuanced examination of the pathways through which climate change affects reproductive health and the interconnectedness of human, animal, and environmental well-being. By doing so, we can develop more holistic strategies to mitigate the impacts of climate change on reproductive health and promote overall ecological resilience.

To summarize, while this research contributes to our understanding of the intersection between climate change and reproductive health, future studies should expand upon this by investigating the implications within the One Health framework. By embracing a comprehensive approach, we can better address the complex challenges posed by climate change to reproductive health and foster sustainable solutions for the well-being of all living organisms.

Conflict of interest

The authors declare no Conflict of Interests.

Data availability

The data that support the findings of this study are available from the corresponding author—Dr. Vaageessan Masilamani—upon reasonable request.

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