Research Article

The Evolving Dynamics Of Natural Versus Artificial Intelligence: An Emergent Framework For Public Health Technology Assessment

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Abstract

The interaction between natural intelligence (NI) and artificial intelligence (AI) is becoming increasingly important with advancements in technology. While NI has historically driven human progress, AI introduces new models in problem-solving and decision-making. This study explores the dynamics between these forms of intelligence and their implications for public health technology assessment. This review employs a multidisciplinary approach, including historical analysis, comparative case studies, and examination of ethical considerations, to assess the impact of AI relative to NI. Natural intelligence has traditionally addressed complex problems, but AI now enhances capabilities through data analysis and precision. While AI offers significant benefits across sectors such as health care, finance, and education, it also raises concerns about data privacy, ethics, and job displacement. In public health, AI can improve disease management and resource allocation, though challenges related to health disparities and data security persist. The integration of AI presents substantial opportunities but requires careful management of ethical and practical challenges. Maintaining a balance between leveraging AI and preserving human cognitive functions is crucial. Developing a prototype model to address current global public health challenges, based on the perspectives presented and the considerations discussed, could provide valuable additional insights into effective strategies for managing these complex issues worldwide. The future of AI involves integrating technological advancements with human intelligence to enhance capabilities while addressing ethical and practical issues. This balance will be key to advancing public health and other sectors effectively.

Keywords: *Big data management, digital technologies, innovation, populational well-being, resource allocation.*

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Araştırma Makalesi

Doğal Ve Yapay Zekânın Gelişen Dinamikleri: Halk Sağlığı Teknoloji Değerlendirmelerinde Yeni Bir Çerçeve

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Öz

Doğal zekâ ile yapay zekâ arasındaki etkileşim, teknolojik ilerlemeler sürecinde giderek daha fazla önem kazanmaktadır. Tarih boyunca doğal zekâ, insanlığın ilerlemesini yönlendirmiştir; ancak yapay zekâ, problem çözme ve karar verme süreçlerinde yeni modeller sunmaktadır. Bu çalışma, bu iki zekâ biçimi arasındaki dinamikleri ve halk sağlığında teknolojik değerlendirmeleri incelemektedir. Bu inceleme, yapay zekânın doğal zekâya göre etkilerini değerlendirmek amacıyla tarihsel analiz, karşılaştırmalı vaka çalışmaları ve etik değerlendirmeleri içeren disiplinler arası bir yaklaşımı benimsemektedir. Doğal zekâ genellikle karmaşık problemleri ele alırken, yapay zekâ veri analizi ve hassas ölçümler aracılığıyla yetenekleri geliştirmektedir. Yapay zekâ, sağlık, finans ve eğitim gibi sektörlerde önemli faydalar sağlarken, veri gizliliği, etik ve iş kaybı gibi endişeleri de beraberinde getirmektedir. Halk sağlığında yapay zekâ, hastalık yönetimini ve kaynak tahsisini iyileştirebilir; ancak sağlık eşitsizlikleri ve veri güvenliği gibi zorluklar göz önünde bulundurulmalıdır. Yapay zekânın entegrasyonu büyük fırsatlar sunmakla birlikte, etik ve pratik zorlukların dikkatli bir şekilde yönetilmesi gerekmektedir. Yapay zekâyı kullanılırken, insanın bilişsel işlevlerini korumak ve aralarında denge sağlamak çok önemlidir. Sunulan perspektifler ve tartışılan hususlar temelinde, küresel kamu sağlığı sorunlarına yönelik bir prototip model geliştirmek mümkündür. Karmaşık sorunları küresel ölçekte yönetebilmek için etkili stratejilerin geliştirilmesine yönelik ek bilgiler sunulmaktadır. Yapay zekânın geleceği, teknolojik gelişmeleri insan zekâsı ile entegre etmek yoluyla yetenekleri artırmayı ve etik ile pratik sorunları ele almayı içerir. Bu denge, halk sağlığı ve diğer sektörlerde etkili bir ilerleme sağlamanın anahtarı olacaktır.

Anahtar kelimeler: Büyük veri yönetimi, dijital teknolojiler, inovasyon, toplumsal iyilik hali, kaynak tahsisi,

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1. Introduction

In the context of rapid technological advancement, the interplay between natural intelligence (NI) and artificial intelligence (AI) has emerged as a crucial area of exploration. Historically, human intelligence, a product of cognitive evolution and experiential learning (Gottfredson, 2003; Gottfredson, 2007), has driven progress and innovation. The advent of AI, which seeks to emulate human cognitive functions through technological means (Nilsson, 2010), presents a new paradigm in problem-solving and decision-making (Russell & Norvig, 2016; Deary, 2000). This review aims to dissect the advantages and disadvantages of integrating AI into various sectors, with a focus on its implications for public health technology assessment in a future world.

Türkiye integrates Health Technology Assessment (HTA) into its health care system, a process that began in 2012 with the establishment of the Department of Health Technology Assessment. Although HTA is critical for developing evidence-based health policies, full integration has not yet been achieved due to legal, administrative, and coordination issues, especially when faced with challenges such as an aging population and rising health care costs. The National HTA Strategy Document of 2019 recommends creating an independent HTA institution to address these challenges and enhance collaboration with academia and the private sector, aiming to improve the efficiency and sustainability of Türkiye's health care system (Dilmaç *et al*., 2024).

This research investigates the evolving dynamics of NI versus AI, elucidating the future implications for public health technology assessment. The article explores the impact of digital technology approaches in a rapidly evolving world, comparing them with natural human intelligence and problem-solving strategies in the context of addressing global public health challenges.

2. Material and Method

This study employs a comprehensive multidisciplinary approach to examine the evolving dynamics between NI and AI within the context of public health technology assessment. The research integrates multiple methods to explore the comparative effectiveness and ethical considerations of both forms of intelligence in tackling global public health challenges. These methods include historical analysis, comparative case studies, and ethical evaluation. The study specifically examines the application of AI in key areas such as disease surveillance, resource allocation, diagnostic accuracy, and health disparities.

2.1 *Research design*

This research adopts a qualitative, interdisciplinary methodology that combines historical analysis, case study comparison, and ethical evaluation. The research design is structured to provide a multifaceted understanding of the role of AI in public health decision-making processes and its interplay with human cognition and expertise. This integrative approach allows for a thorough exploration of the challenges and opportunities that arise from AI integration in health care systems. The following components outline the key stages used in the design of this original research.

- **Historical analysis**: A retrospective review of the evolution of human intelligence and AI's development, focusing on cognitive science milestones, the emergence of machine learning (ML) technologies, and their potential to emulate or surpass human problem-solving capabilities.

- **Comparative case studies**: A detailed examination of real-world applications of AI across various public health sectors, comparing AI-driven approaches to human-led methods in areas such as disease surveillance, resource management, and diagnostic systems.
- **Ethical evaluation**: A critical assessment of the ethical implications surrounding the integration of AI in public health, examining issues like data privacy, algorithmic bias, equity, and accountability.

2.2. Data sources

Primary data sources include a variety of academic literature, case study reports, and ethical frameworks that provide insights into both the historical and contemporary roles of AI in public health. The data sources are as follows:

- **Academic literature**: A thorough review of peer-reviewed journals, books, and reports related to cognitive science, artificial intelligence, and public health. This includes research on AI's role in health care, technology adoption, and the ethical considerations surrounding its use. Key studies on AI-driven disease surveillance, diagnostic tools, and health resource optimization form the foundation of the literature review.
- **Case studies**: Real-life case studies of AI applications in public health were sourced from publicly available research reports, government and institutional publications, and industry white papers. These include documented instances of AI systems used for managing health crises; e.g., COVID-19 surveillance, diagnostic tools like DeepMind for radiology, AI-driven resource allocation systems during the pandemic, and their comparison to human-led interventions.
- **Ethical documents**: A review of established regulatory and ethical frameworks, and other relevant health technology ethics guidelines. These documents offer insight into the ethical considerations for implementing AI in health care, especially concerning patient privacy, data security, and algorithmic fairness.

2.3. Methodological approach

The study employs a three-pronged methodological approach.

- **Historical analysis**: This component traces the historical development of human cognition and the emergence of artificial intelligence, particularly through the lens of cognitive science and AI evolution. Key milestones in the field of AI, such as early rule-based systems, ML algorithms, and deep learning (DL) advancements, are explored to understand the trajectory of AI's capabilities and its increasing role in public health.
- **Comparative case studies**: Real-world case studies are critically analyzed to compare traditional human-led interventions with AI-powered solutions. Disease surveillance systems that were AI-driven are contrasted with human-led surveillance efforts from the Ebola outbreak. Diagnostic technologies in radiology are often similarly compared with the performance of human radiologists in terms of accuracy, speed, and cost-effectiveness. This comparison focuses on the strengths and limitations of both approaches in various public health settings.
- **Ethical evaluation**: This part of the study examines the ethical implications of integrating AI into public health decision-making. A content analysis approach is used to evaluate ethical concerns such as data privacy, the risk of algorithmic bias, and equity in health outcomes. Case studies are analyzed to assess how AI tools impact health

disparities, privacy protection, and transparency in decision-making processes. The research also evaluates frameworks such as the principles of biomedical ethics and public health ethics to guide the responsible use of AI in health care.

2.4. Data analysis

The data analysis is primarily qualitative and comparative, structured around the following steps.

- **Comparative analysis of case studies**: Case studies are systematically analyzed to identify key differences in outcomes between AI-driven and human-led approaches. Key variables include efficiency, which refers to the speed of data processing; accuracy, which encompasses diagnostic correctness and surveillance precision; scalability, which is the ability to handle large datasets; and cost-effectiveness, which involves resource utilization. The results of AI interventions are compared with traditional methods to assess their relative benefits and limitations in specific public health contexts.
- **Thematic content analysis**: A qualitative analysis of ethical guidelines and privacy regulations is conducted to identify themes such as data protection concerns, algorithmic bias, and accountability in AI systems. This thematic analysis will examine how ethical frameworks can be applied to address the challenges posed by AI in public health systems.
- **Synthesis of findings**: The results from both the case studies and ethical evaluations are synthesized to provide a comprehensive view of AI's role in public health technology assessment. The analysis will integrate the historical context, comparative case study outcomes, and ethical considerations to offer insights into the benefits and challenges of AI integration.

3. Results

3.1. Historical context and technological advancement

Historically, NI sufficed for addressing the challenges of its time. Human cognition was critical in solving complex problems and driving societal evolution (Bostrom, 2014). The emergence of AI marks a transformative leap, enabling machines to augment, and in some cases, surpass human cognitive abilities in specific domains (Brundage, 2015).

3.2. Changing needs and complementary roles

As societal challenges have grown in complexity, the limitations of NI have become more apparent. The ability of AI to analyze vast datasets, identify patterns, and execute tasks with precision offers complementary strengths to human intelligence (Turing, 1950). This synergy is crucial for addressing contemporary issues across various fields, such as health care, finance, and education (Lee, 2020). The potential for AI to handle large-scale data analysis and automate routine tasks presents new opportunities for enhancing efficiency and accuracy.

3.3. Impact on society and philosophical implications

The rise of AI raises significant philosophical questions about the role of human intelligence in an increasingly automated world. While AI offers substantial benefits, including efficiency and precision, there are concerns about the erosion of human creativity and cognitive uniqueness

(Zhai *et al*., 2024; Penrose *et al*., 2022). The over-reliance on AI may lead to a diminished role for human intellect, potentially undermining the value of human ingenuity and problem-solving abilities.

3.4. The role of artificial intelligence across sectors

Contributions from artificial intelligence span various sectors, significantly enhancing capabilities and efficiency. In health care, improvements in diagnostic accuracy, personalized treatment plans, drug discovery, and remote monitoring are achieved (Topol, 2019; Topol, 2019), though challenges like data privacy and ethical considerations remain. The financial sector benefits from advances in fraud detection, algorithmic trading, credit scoring, and risk management (Zhang & Dafoe, 2019), with increased efficiency and predictive accuracy, but concerns about algorithmic biases and financial inequalities persist. In retail, optimization of customer experiences, inventory management, and predictive analytics is made possible (Hajli, 2014), while issues related to consumer privacy and job displacement need addressing. Advancements in autonomous vehicles, driver-assistance systems, and predictive maintenance are supported in the automotive industry (Kalra & Paddock, 2016), with improvements in safety and efficiency but challenges in regulatory standards and public trust. Manufacturing sees increased efficiency through predictive maintenance, quality control, and supply chain management (Qin *et al*., 2016), although job displacement and the need for workforce reskilling are significant concerns. Personalized learning experiences, automated grading, and content recommendations are provided in education (Baker, 2010; Romero & Ventura, 2013), yet there are concerns about data security and reduced human interaction. Public safety, administrative automation, and resource allocation are improved in government applications (Harrison & Luna-Reyes, 2022), offering enhanced efficiency and decision-making while facing challenges related to transparency and accountability. Finally, enhancements in network management, customer service via chatbots, and predictive maintenance are achieved in telecommunications (Chandrasekaran *et al*., 2017), with benefits in service quality and operational efficiency, though data security and job impacts in customer service are notable issues.

3.5. Public health technology assessment

The integration of AI into public health presents both opportunities and challenges. It can enhance disease surveillance, improve patient care, and optimize resource allocation (Brynjolfsson *et al*., 2018). Concerns include the potential for exacerbating health disparities, issues with data privacy, and the need for rigorous validation of AI-driven health interventions.

The debate between NI and AI in global public health is illustrated by numerous case examples across various domains. In **disease surveillance**, human expertise in managing outbreaks, such as the 2014–2016 Ebola crisis, relied heavily on traditional methods like field reporting and expert judgment; however, AI and digital technologies, such as ML models developed during the Ebola outbreak (Colubri *et al*., 2019), improved crisis response by providing predictive insights and real-time data integration, demonstrating the complementary role of AI in enhancing human efforts (Bempong *et al*., 2019). Similarly, in **diagnostic accuracy**, while radiologists traditionally relied on visual assessment, AI algorithms, particularly DL, have significantly advanced image analysis, allowing for faster and more precise detection of conditions like cancer (Hosny *et al*., 2018). Yet, despite AI's potential, the expertise of radiologists remains essential for validating AI’s findings and ensuring its clinical relevance (Rubin, 2019). In **personalized treatment**, natural intelligence, as seen in multidisciplinary teams for cancer care, leverages extensive clinical knowledge for tailored treatment plans.

Applications like AI Watson for Oncology have shown promise in providing treatment recommendations, though they still require human oversight and contextual adjustments for local populations, such as in the case of lung cancer treatment in China (Liu *et al*., 2018). When it comes to **resource allocation**, human triage in emergency situations is critical for prioritizing care, but AI models can optimize resource use in mass casualty settings by predicting patient needs and enhancing fluid resuscitation strategies (Jin *et al*., 2024). Moreover, AI's role in **addressing health disparities** is demonstrated by its use in community-based health care, where AI tools assist in diagnosis, surveillance, and resource allocation, particularly in underserved regions (Abbasgholizadeh Rahimi *et al*., 2021; Hadley *et al*., 2020). However, AI also raises significant concerns in **data privacy**, as its ability to handle vast amounts of sensitive health data can lead to risks of breaches or misuse, highlighting the need for stronger legal frameworks and data protection mechanisms (Martin & Zimmermann, 2024; Yadav *et al*., 2023). **Ethical considerations** surrounding AI in health care include concerns about bias, accountability, and informed consent, especially as AI tools may replace or augment human decision-making in sensitive areas like medical assessments (MacIntyre *et al*., 2023; Farhud & Zokaei, 2021). These examples underscore the complex interplay between human and artificial intelligence, where AI enhances but does not fully replace human involvement in global health initiatives **[Table 1]**. This table summarizes the global public health case examples illustrating the key points of the debate on NI versus AI and highlights how both human expertise and machine-based Technologies contribute to global public health efforts, emphasizing their respective roles in different aspects of health care.

Table 1. Current global public health case examples illustrating the key points of the debate on "natural versus artificial intelligence."

Key point	**Natural intelligence Case example**	**Artificial intelligence Case example**	**Real-life examples**
Disease surveillance	Ebola response (Bempong et al., 2019): Health care professionals used traditional methods such as field reporting and expert judgment to track Ebola cases. Challenges included scalability and misinformation.	Ebola and AI (Colubri et al., 2019): ML models were developed to predict outcomes based on real-time data, offering predictive insights to health care workers in resource-limited settings.	Ebola outbreak (2014-2016): AI tools integrated into the Ebola Care Guidelines app helped manage outbreaks with improved speed, accuracy, and crisis response.
Diagnostic accuracy	Radiologists' expertise: Human radiologists have been crucial in diagnosing diseases, with reliance on visual cues and clinical knowledge to detect abnormalities.	AI in Radiology (Hosny et al., 2018): DL models, like convolutional neural networks, help identify patterns in radiographs and automate image analysis for faster and more accurate diagnosis.	Radiology AI applications: AI systems have been deployed to assist radiologists in detecting cancers and other diseases in medical imaging, enhancing diagnostic accuracy.
Personalized treatment	Multidisciplinary decision-making: Oncologists collaborate using their expertise and clinical knowledge to create personalized treatment plans for patients based on individual needs and medical history.	Watson for Oncology in China (Liu et al., 2018): Watson for Oncology provided treatment recommendations, which were consistent in 65.8% of lung cancer cases, offering tailored suggestions for individualized care.	Lung Cancer treatment in China: Watson's AI recommendations for personalized cancer treatment proved valuable in aligning with clinical teams but still required expert oversight.
Resource allocation	Human-based triage in emergency care: Medical teams allocate resources based on experience, prioritizing patients based on severity and available resources in emergencies.	AI for Hemorrhage Treatment (Jin et al., 2024): AI models optimized resource allocation in mass casualty scenarios, predicting patient needs and improving fluid resuscitation efficiency.	Trauma care in emergencies: AI applications in emergency settings can better allocate resources and predict outcomes, enhancing the efficiency of pre-hospital care.
Addressing health disparities	Community health workers' outreach: Human-driven initiatives targeting underserved populations rely on cultural knowledge and direct community engagement to improve health outcomes.	AI in Community-Based Primary Health care (Abbasgholizadeh Rahimi et al., 2021): AI tools, including ML and natural language processing, are applied to diagnose, detect, and surveil health conditions in underserved populations.	AI in Global Health (Hadley et al., 2020): AI was used to address public health inequities by optimizing health care resources, improving disease prediction, and expanding access in low-resource settings.
Data privacy	Traditional methods of health data storage: Health data was stored manually or in centralized databases, with varying degrees of patient consent and security measures.	AI and Data Privacy (Martin & Zimmermann, 2024): The use of AI in health care raises privacy concerns, particularly with data sharing and the risk of breaches due to AI's ability to reidentify anonymized data.	Health Data Security (Yadav et al., 2023): In the era of AI, concerns about patient data privacy and security are growing, especially regarding cyberattacks and AI-based data misuse.
Ethical considerations	Human decision-making in medical assessments: Ethical decisions are traditionally made by human clinicians, guided by professional codes, empathy, and consideration for patient rights.	AI in Medical Decision-Making (MacIntyre et al., 2023): AI tools, while helpful, raise ethical concerns about bias, accountability, and the potential for replacing human judgment in sensitive health care decisions.	Ethical Issues in AI (Farhud & Zokaei, 2021): The integration of AI in health care has raised questions about informed consent, privacy, job displacement, and the ethical use of technology in medical decision-making.

4. Discussion and Conclusion

The integration of AI into various sectors, including public health, represents a significant advancement in technology. The AI ability to process vast amounts of data and perform complex tasks offers substantial benefits, such as increased efficiency, accuracy, and innovation. These advancements, however, are accompanied by challenges that must be carefully managed.

Image 1. An emergent natural versus artificial intelligence framework for public health technology assessment.

This article introduces a novel illustration that positions medical and public health practice, the population perspective, and within the decision-making process, all framed by the dynamic interplay between NI and AI. This contribution is presented as original, based on an extensive review of the literature. The icons, specifically assembled by the author for this work, represent key elements of **medical practice**, **population** health benefits, and the central role of the two hands, traditionally symbolizing **public health**, in the interaction between **NI** and **AI** [Image 1]. In interpreting both the image and the information presented in the first table, the medical practice icon in the illustration represents radiologists' expertise and multidisciplinary decision-making, emphasizing the ongoing importance of human expertise in clinical settings. The public and population health perspective icons reflect AI's potential in **disease surveillance**, **personalized treatment**, and **addressing health disparities**, as well as enhancing disease tracking, source management, and health equity. At the core, the **public health assessment** icon emphasizes the critical role of human judgment in diagnostic accuracy, **resource allocation**, **data privacy**, and **ethical considerations**, ensuring the ethical, culturally sensitive, and balanced integration of AI in public health. This visual representation highlights the

symbiotic relationship between NI and AI to guide the future of public health technology [Table 1] [Image 1].

In public health, AI holds the potential to revolutionize disease prevention, diagnosis, and treatment. For instance, AI can analyze patterns in health data to predict disease outbreaks and optimize resource allocation (Brynjolfsson *et al*., 2018). Despite these benefits, there are concerns about data privacy, ethical considerations, and the potential for deepening existing health disparities. The effectiveness of AI in public health depends on addressing these issues and ensuring that AI technologies are implemented transparently and equitably.

The philosophical and ethical implications of AI integration emphasize the need for a balanced approach. While AI can augment human capabilities, it is essential to preserve the unique aspects of human intelligence, such as creativity and critical thinking (Penrose *et al*., 2022; Zhai *et al*., 2024). The future of AI will involve navigating the tension between leveraging technological advancements and maintaining the value of human cognitive functions.

The comparison of natural versus artificial intelligence in public health technology assessment highlights the evolving role of AI in enhancing efficiency and accuracy, particularly in disease surveillance and patient care. While human intelligence, rooted in cognitive growth, has been central to past problem-solving and societal progress, AI offers transformative capabilities that can surpass human limitations in handling complex issues. However, this advancement raises concerns about over-reliance on AI, potential privacy breaches, ethical dilemmas, and the impact on human creativity, necessitating a balanced integration where AI complements rather than replaces human intelligence [Table 2].

Table 2. Primary considerations and fundamental aspects of "natural versus artificial intelligence" within the context of public health technology assessment.

Section	Natural intelligence		Artificial intelligence
1. Introduction	Human intelligence has evolved through cognitive growth and learning.		AI emulates human cognitive functions through technology, offering new paradigms in problem-solving.
2. Methods	Historical and philosophical analysis of human intelligence.		Comparative case studies, sector-specific analyses, and ethical considerations in AI.
3. Results	**3.1 Historical Context**	Human cognition was essential for past problem-solving and societal evolution.	AI represents a transformative leap, enabling machines to augment or surpass human cognitive abilities in some areas.
	3.2 Changing Needs	Human intelligence has limitations in handling complex, large-scale problems.	AI's data analysis and task execution capabilities offer complementary strengths, enhancing efficiency and accuracy.
	3.3 Societal Impact	Human creativity and problem-solving are critical and may be diminished by over-reliance on AI.	AI provides efficiency and precision but raises concerns about eroding human cognitive uniqueness and creativity.
	3.4 Sector Contributions	Significant in addressing various challenges historically.	Enhances capabilities across sectors: health care, finance, retail, automotive, manufacturing, education, government, telecommunications, with each sector facing specific benefits and challenges.
	3.5 Public Health Technology Assessment	Historically driven by human expertise in disease management and resource allocation.	AI can improve disease surveillance, patient care, and resource optimization, but may exacerbate health disparities and privacy concerns.
4. Discussion	Human intelligence must be preserved alongside AI advancements.		AI offers substantial benefits but must be managed to address privacy, ethical issues, and potential impact on human creativity.
5. Conclusion	Integration of AI should complement rather than replace human intelligence.		AI should enhance human capabilities while maintaining the essence of human creativity and problem-solving skills.

The comparative analysis of NI and AI highlights a transformative period in technological evolution. Significant advantages across various sectors, including health care, finance, and education, are offered through AI by enhancing efficiency and accuracy; however, it is crucial to address the challenges associated with AI, such as data privacy, ethical considerations, and the potential erosion of human creativity. In the context of public health, AI presents opportunities for improved disease management and resource optimization. Nonetheless, careful consideration is needed to ensure that AI applications do not exacerbate health disparities and that they are implemented with transparency and ethical rigor.

The future lies in a harmonious integration of natural and artificial intelligence, where AI enhances human capabilities without diminishing the essence of human ingenuity. By

embracing both forms of intelligence, we can foster innovation, address societal challenges, and ensure that technological advancements.

Limitations

This study has several limitations. The reliance on secondary data and qualitative methods may not fully capture the complexities of real-world AI implementation, particularly regarding long-term outcomes or unforeseen challenges. The case study analysis is restricted to publicly available data, excluding proprietary or unpublished applications. The ethical evaluation, based on established frameworks, may not entirely address emerging issues like algorithmic bias or AI decision-making in high-stakes clinical settings. While this analysis is a valuable first step, future research should include quantitative assessments of AI's performance in public health, with empirical data on system efficiency, accuracy, and patient outcomes.

Ethics statement: Ethical approval was deemed not applicable (N/A), as this original research article does not involve direct human participants, animal subjects, or clinical trials. The study explores the dynamics between natural and artificial intelligence in public health technology assessment through a theoretical and multidisciplinary approach, relying on existing secondary data sources, including academic literature, case studies, and regulatory guidelines, rather than new data collection or experimentation. Since the research does not involve interventions with living subjects, institutional review board oversight was not required. Ethical concerns, including data privacy, algorithmic bias, and health disparities, are examined through existing frameworks. This approach aligns with the Declaration of Helsinki, maintaining scientific integrity, transparency, and respect for privacy, without the need for traditional ethical approval.

Conflict of interest: None declared.

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