

# Artificial Intelligence in Public Health – Recent Developments, Challenges and Opportunities

October 18, 2023

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On October 18, 2023, the IANPHI European Network hosted a webinar on “Artificial intelligence in Public Health – Recent Developments, Challenges and Opportunities”.

Under the moderation of Dr. Trygve Ottersen, Executive Director at the [Norwegian Institute of Public Health](#) and Chair of the IANPHI European Network, this webinar highlighted the current challenges and opportunities for public health brought by the recent developments of artificial intelligence (AI). In this session, the panelists collectively discussed the opportunities and challenges of integrating AI into public health, the need for responsible and transparent practices, and the potential for AI to improve public health outcomes.

Panelists:

- Jasper Littmann, Specialist Director in the Division of Infection Control at the [Norwegian Institute of Public Health](#)
- Prof. Marcel Salathé, Associate Professor and Founding Director of the Lab of Digital epidemiology at [EPFL Lausanne](#)
- Dr. Louisa Nolan, Head of Data Science at [Public Health Wales](#)
- Prof. Dr. Dr. Lothar Wieler, Speaker of the Digital Health Cluster at the [Hasso-Plattner-Institute](#) and former President of the [Robert Koch-Institut](#)

## General Questions

By [Jasper Littmann, Specialist Director in the Division of Infection Control at the Norwegian Institute of Public Health](#)

Jasper Littmann outlined three general questions relevant to National Institutes of Public Health regarding their role in the field of artificial intelligence (AI):

- **Opportunities and Risks:** The first question revolved around how to leverage AI opportunities while mitigating risks. This includes ensuring data protection, personal data privacy, intellectual property rights, and avoiding biases and discrimination in AI-generated results.
- **Supporting Healthcare System:** The second question focused on how these institutes can support and enable other parts of the healthcare system to use AI effectively and safely. It also hints at a potential regulatory role.
- **AI's Broader Impact:** The third question pertained to how AI will shape the world and how it will affect the work and research of public health institutes. This involves addressing challenges in data management, improving efficiency, and researching the societal impact of AI, such as combating misinformation and addressing potential threats related to AI-generated toxins.

Jasper Littmann emphasized the need to explore the opportunities presented by AI and not solely focus on risks. He also highlighted the importance of reevaluating data management practices to harness the full potential of AI applications. Additionally, the role of these institutes as advisors in quality assurance and their function in identifying and addressing emerging risks was underlined by them. These points provide a framework for the institutes' role in AI-related public health initiatives.

## The Intersection of Computer Science and Public Health

By Prof. Marcel Salathé, Associate Professor and Founding Director of the Lab of Digital epidemiology at EPFL Lausanne

Prof. Marcel Salathé introduced his talk by discussing the intersection of computer science and public health, highlighting the recent success of large language models in AI. These models are versatile and can perform a wide range of tasks, reducing the need for specialized models. He anticipated that foundational models with billions of parameters will become the norm, revolutionizing various fields, including public health.

Prof. Salathé mentioned that AI will impact public health in numerous ways, improving efficiency and creating new possibilities. However, for him, the exact changes are hard to predict, similar to the unpredictability of services like Uber and Airbnb with the advent of smartphones. He also emphasized the importance of AI in disease prevention, serving as a "health expert in your pocket."

Finally, Prof. Salathé expressed concerns over the misuse and biases of AI, but believes that these issues can be addressed with technology. He is more concerned about the false choice between AI and privacy, asserting that it's possible to have both but not necessarily straightforward. Lastly, there is an expressed concern about the pace of change in public health, with a call to establish partnerships between public health agencies and academic institutions to expedite progress.

## The Potential of Artificial Intelligence (AI) in Public Health

By Dr. Louisa Nolan, Head of Data Science at Public Health Wales

Dr. Louisa Nolan discussed the potential of AI in public health and why it's crucial to address the associated risks and barriers. She highlighted various applications of AI in public health, such as predictive analysis, disease projections, outbreak detection, and personalized health interventions, and also touched on generative AI for tasks like summarizing papers and data processing.

The main barriers to AI adoption in public health mentioned were trust, ethical concerns, regulatory governance, algorithmic transparency, and the need for capacity building. Dr. Nolan emphasized the importance of skills, data management, user engagement, and workforce planning.

In the context of Wales, she outlined efforts to establish a safe and ethical framework for AI in health and social care. These efforts include adapting existing ethical frameworks, creating a register of AI devices, understanding user needs and barriers, and building a supportive ecosystem through partnerships with academia and the private sector. The ultimate goal is to leverage AI to improve public health while ensuring safety and ethics.

# The Implementation of Artificial Intelligence (AI) in Public Health

By Prof. Dr. Dr. Lothar Wieler, Speaker of the Digital Health Cluster at the Hasso-Plattner-Institute and former President of the Robert Koch-Institut

Prof. Dr. Dr. Lothar Wieler addressed the implementation of AI in public health, emphasizing the need for strategic planning and the preservation of trust. He acknowledged the privacy concerns in Germany but stressed that 100% safety and efficiency cannot be guaranteed. Instead, he advocates for transparent and open risk communication.

For Prof. Dr. Dr. Wieler, it is important to convince conservative epidemiologists in NPHIs of the value of AI tools. He argued that public health institutes need to take the lead in transforming their business models to embrace AI's potential, emphasizing the importance of implementation driven by end-users.

In terms of practical steps taken at the Robert Koch Institute, Prof. Dr. Dr. Wieler mentioned initiatives like seminars on digital epidemiology, building networks with competent partners focused on implementation, and launching a Center for Artificial Intelligence and Public Health. The Robert Koch-Institut also has in mind to join international networks, like the [Artificial Intelligence, Innovation and Society \(AIIS\)](#) and the [Global Initiative on AI for Health \(GI-AI4H\)](#), to foster collaboration and knowledge sharing.

Prof. Dr. Dr. Wieler emphasized that AI can be applied in various areas of public health, such as the essential public health functions or operations. He suggested that AI can improve efficiency and precision, freeing up the workforce for areas like prevention and health promotion. Ultimately, Prof. Dr. Dr. Wieler urged public health institutions to invest in AI and lead by example while collaborating with international bodies like the [World Health Organization \(WHO\)](#).

## Discussion

The discussion in the webinar focused on the intersection of AI and public health. Panelists highlighted the importance of using AI not just in healthcare but also in public health, emphasizing the need to address broader health-related issues.

Further, the significance of preventive healthcare, such as AI-based chatbots for pregnant women in Kenya and AI tools for cervical cancer screening, which can lead to significant efficiency gains, were discussed. Transparency, open-source initiatives, and collaboration between public health agencies, academic centers, and global health organizations were seen as essential for the responsible development and deployment of AI in public health.

The panel also touched on the challenges of bias in AI and the need for benchmarks to measure and correct these biases. The issue of data quality was raised, with panelists noting that although better data is desirable, AI can still provide value even with less than perfect data.

In summary, the webinar emphasized the role of AI in public health and the need for a collaborative approach, open-source initiatives, and addressing issues like bias to ensure the responsible and effective use of AI in improving public health outcomes.