

Future of Healthcare and Artificial Intelligence (AI): Practical Insights and Diverse Perspectives on AI in Healthcare Project Management¹

Artificial Intelligence Enablement of Public Health: A Transformative Approach²

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INTRODUCTION

Including the social dimension of healthcare in any new or emerging technology is a part of a globalized, interconnected reality that defines the world. This is important to promote approaches to health equity, diversity, and security. Artificial Intelligence (AI) in public health is a part of this global necessity.

Several unique features distinguish public health from traditional healthcare approaches focused on individual patients. For example, a population-based focus, prevention over treatment, focus on equity with dismantling systemic factors that contribute to health disparities, collaboration across diverse sectors, and focus on health promotion and regulations are a few. Understanding these unique factors is critical to understanding how Artificial Intelligence (AI) can prove to be beneficial to this sector. The ever-growing mountains of healthcare data and the increasing complexity of public health challenges demand a revolutionary approach. AI is emerging as a powerful tool for healthcare project managers (PMs) in the public health sector, offering the potential to streamline workflows, optimize resource allocation, and, ultimately, improve population health outcomes. AI was integral to forecasting COVID-19 spread, contact tracing, pharmacovigilance, rapid testing, and detection, and increased the effectiveness, precision, and scalability of public health treatments.

This article delves into the transformative role of AI in healthcare PM for public health, exploring how AI empowers PMs to tackle contemporary challenges and build a more data-driven future for public health initiatives.

¹ Editor's note: This series is by Dr. Deepa Bhide, a practicing pediatrician with additional experience in information technology and project management. Her 2023 series of articles introduced readers to a range of important issues related to programs, projects and PM in healthcare. In this new series, Dr. Bhide will interview experienced healthcare, IT and project professionals around the world to reflect on the impact of artificial intelligence on global healthcare. Learn more about Dr. Bhide in her author profile at the end of this article. To read previous works by Dr. Bhide, visit <https://pmworldlibrary.net/authors/dr-deepa-bhide/>

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Public Health Experts – The Transformists!

Excerpts of interviews with the following experts:

Dr. Nikesh. R. Shah, CEO, National Cancer Grid-Koita Center for Digital Oncology (NCG-KCDO)

Rudi de Koker, Project Management Professional and Public Health Specialist

Dr Dattatraya Patil, Sr. Biostatistician at Emory University School of Medicine, USA

A few public health experts interviewed wished to contribute anonymously.

The Interviews

Q 1: Do you use AI in any form in your current work area? If yes, how do you currently utilize AI in your day-to-day work? If not, where would you like to start using AI in your work?

“While AI hasn't been directly implemented in my projects, we currently utilize automated decision-making algorithms for enhanced efficiency. Although not labeled as traditional AI, these algorithms analyze data, identify patterns, and provide informed recommendations. Looking ahead, exploring advanced AI applications like predictive analytics and machine learning is on the horizon, offering opportunities for innovation and process optimization in our work,” Rudi mentioned.

“Machine learning and advanced analytics have been in our applications for years. We have used pattern recognition and analysis to predict the onset of epidemics, disease surveillance, risk assessment and prediction, and so on. It's only now, with Generative AI, that this technology has been democratized and is in the news. The employment of AI increased with the advent of COVID-19 when machine learning algorithms were used mainly to predict resource requirements and assess health risks. I'd say the technology is evolving,” anonymous.

Summary: Significant advances in AI, specifically Gen AI, in these sectors are yet to be seen. AI opportunities in the form of predictive analytics or machine learning have the potential to be used in the public health sector been in use in healthcare and public health sector,

Q 2: What are the most significant opportunities and challenges for using AI in diagnostic and therapeutic interventions in public health?

“AI presents significant opportunities for data-driven interventions, predictive analytics, and resource optimization. Challenges include ensuring equitable access to AI-driven

solutions, addressing data privacy concerns, and fostering interdisciplinary collaboration for effective implementation in diverse healthcare settings. These are key to any public health setting,” Rudi quipped.

“Public health has an extended and complex scope compared to the regular healthcare setting. Improved diagnostic accuracy via analysis of medical images, scans, lab results, personalized treatment plans, and early disease detection from analysis of data from wearable devices or sensors to detect early signs of disease, accelerating drug discovery and development, leading to more effective treatments with fewer side effects and improved treatment planning are some key benefits for healthcare professionals that can be leveraged in public health settings. In resource-poor settings, AI can guide robotic surgical tools with greater precision and minimal invasiveness, leading to faster recovery and better patient outcomes.

The biggest challenges of AI to date are not different in public health. Data privacy and security, hallucinations and algorithmic bias, explainability and transparency, regulatory hurdles, integration with existing healthcare systems, and limited access and affordability. Extensive and extended stakeholder collaboration is also challenging, especially in public health, where stakeholders can range from varied cultural, geo-social-political, and financial backgrounds. We need to have a robust stakeholder management framework to address this concern. Remember, it's not easy to instantly latch on to a new technology,” anonymous.

Summary: Public health can leverage AI's capabilities around data-driven insights to predict epidemics, plan resource requirements, and early diagnose and treat public health issues. Maintaining an ethical framework, data privacy, and awareness of bias and hallucinations are critical to ensuring optimal outcomes.

Q 3: What do you think of AI and the diagnostic decision-making process in the healthcare environment, especially in the public health sector?

“AI holds much promise in the diagnostics space, given that data is generated digitally and conforms to industry-accepted standards, e.g., DICOM. In the near term, it will have more probabilistic value where it can support the clinician in the decision-making process and early detection. Still, over time, as the learning improves, it will also have a deterministic value where we can rely on the AI output without a clinician review, allowing the clinician to focus on higher-complexity work. This is particularly significant in the public health sector and remote areas where the infrastructure and resources are already stretched,” Nikesh mentioned.

“Without a doubt, generative AI and machine learning significantly impact the prognostic ability of disease-detecting markers. However, a significant section of the healthcare industry relies on unstructured data (clinical notes, operative and pathology reports, patient summaries, etc.) that may not meet standards. The biggest impact generative AI can have is parsing this unstructured data and converting it to structured datasets that can be pushed into algorithms.” Dr. Patil mentioned.

“To ensure ethical, transparent, and unbiased AI-powered public health tools, rigorous guidelines must be established, emphasizing transparency in algorithmic processes, regular audits for biases, diverse data representation, and continuous interdisciplinary oversight. Striking a balance between innovation and ethical considerations is paramount for responsible AI deployment in public health.

The ideal diagnostic decision-making process in public health should be a multi-faceted approach that balances efficiency, accuracy, and public trust. For example, decisions should be based on strong scientific evidence and the latest epidemiological data. The decision-making process should be risk-based. One decision-making process should prioritize interventions based on the severity and likelihood of harm from a potential disease outbreak. The diagnostic and treatment processes should address potential healthcare disparities,” Rudi added.

Summary: AI has the potential to revolutionize diagnostics in public health, such as enhanced accuracy, improved efficiency, and early disease detection. However, careful implementation and ongoing monitoring are necessary to ensure its effective and ethical use.

Q 4: Is AI a “magic pill” or a “Pandora’s Box”? How can we communicate the risks and benefits of AI to the public to build trust and acceptance for its use? What would be a realistic timeline for the benefits to reach healthcare professionals and patients?

“In some ways, it is a Pandora’s Box for a layman but with the promise of being a magic pill. The truth is likely somewhere in between. Our understanding of AI continues to improve, and as we have more well-defined use cases, it will help us focus the dialogue on how AI can help in the real world v/s just its promise. I’d say we’re not more than 2-3 years away from tangible benefits reaching healthcare professionals and patients both in the private and public health sectors. Regular communication in a nontechnical language that people can easily understand will help drive awareness and any actionable behaviors that are critical for successful adoption,” Nikesh mentioned.

“Effectively communicating the risks and benefits of AI in public health requires transparent, accessible information. Use clear language and real-world examples, and engage in public forums to address concerns. Establishing guidelines for responsible AI use, emphasizing privacy safeguards, and involving the public in decision-making processes are essential. Building trust through open dialogue and education is vital to fostering acceptance of AI in public health.

I recently read an interesting analogy between AI in healthcare and self-driving cars, where modest but genuinely helpful driving (diagnostic) assistance tools such as autonomous chatbots, documentation of clinical encounters, interpreting images, summarizing clinical information, etc., are made. These are the beginnings of building trust in new technology. It’s a long way to go, anonymous.

“About five years would be a good timeline to establish trust in the technology and see some positive outcomes at the public health level. Initiatives around COVID-19 defied this timeline, though!” Rudi added.

Summary: AI is a powerful tool with immense potential for good. However, like any tool, it must be wielded carefully with individual and public communication approaches to build trust in the new technology and its benefits.

Q 5: How could AI effectively support your work and improve patient care in community health in a rural clinic with limited resources?

“AI can help prioritize timeliness and level of care within the community to optimize limited resources. It can also help with upskilling existing staff and training healthcare staff to take care of basic issues, thereby extending the capacity of the center. Over time, as AI models improve, they can be deployed in specific communities and adapted to the local context to drive further efficiency and quality,” Nikesh mentioned.

“One of rural health care concerns is the effective management of chronic diseases. Limited access to healthcare, low literacy, and poverty can compromise the ideal management of these diseases. AI systems can help in such situations by analyzing patient data (e.g., blood sugar levels and blood pressure) to identify trends and predict potential complications. This can inform personalized treatment plans and timely interventions. AI chatbots can provide patients with 24/7 access to basic health information, answer frequently asked questions, and offer preliminary guidance on managing minor illnesses, offering personalized health education,” Rudi added.

Summary: AI can aid in managing chronic diseases, where ideal management can be less than perfect. From early detection, timely reminders, and follow-ups to personalized care plans, AI-enablement can be a boon to chronic disease management in resource-poor settings.

Q 6: What are the critical considerations of AI integration in a healthcare setting, especially the public health sector?

“We need to start reimagining how the traditional healthcare delivery model will be redefined in the presence of AI. This will require changes to the operational and clinical workflows. Clinicians will need to adapt to a different way of practicing medicine than what they are used to until the new models get established as a habit and integrated within the academic training. There will also be failures along the way, and the system needs to be prepared to correct and learn the course rather than abandon it altogether. Training clinicians on how they can become a more integral part of such innovation and providing feedback to help improve the technology in a way that can be eventually helpful for them will be key,” Nikesh mentioned.

“Although different clinical disciplines will be impacted differently, the effect will not be seen across the entirety of medical care from the patient’s point of view. Focusing on

patient care and the good of the many should be the goal here rather than profit,” Dr. Patil added his points.

“Public health hinges on using technology for spatial modelling, risk prediction, misinformation control, public health surveillance, disease forecasting, pandemic/epidemic modelling, and health diagnosis. Along with these, job displacement concerns, availability of expertise, cost and infrastructure, and public perception of trust are important, too. AI integration should be able to satisfy these key concerns so that it can be adopted successfully at all levels of public health, from international programs to the grassroots level,” Rudi brought to our attention.

Summary: The need of the hour is an integrated approach to processes using technologies such as AI and not using the technology in silo. This approach should encompass other attributes such as creating new jobs, skills availability, relocation and upskilling, change management, business process reengineering, and more.

Q 7: Project management of AI in healthcare is evolving with AI technology. What are the challenges unique to AI project management in public health?

Public health projects involving AI must be implemented effectively and ethically, promoting positive public health outcomes. There are a few unique aspects to consider. Scenario: A remote village in India is experiencing an unknown illness with flu-like symptoms. The village community has recently recovered from COVID-19 assault. During the COVID-19 operation, health officials initiated public awareness, medication availability, sanitation, vaccination, and other measures to contain the spread of the deadly virus. In the wake of these symptoms, health officials need to act quickly to identify the cause of the illness to prevent its further spread in this region with scarce healthcare infrastructure. The project, along with an urgency of action and medical management, must also focus on social impact assessment and long-term implications. A few key challenges include limited existing medical data for analysis, incomplete or inaccurate data due to reliance on paper records, lack of knowledgeable resources, potential language barriers, cultural issues, data privacy concerns, limited communication infrastructure, and more. A few project management solutions:

- Ensuring data availability, quality, and interoperability as large data sets are required for model creation. A robust data governance framework to ensure data privacy, security, compliance with ethical regulations, and mitigation of biases.
- Open communication, building trust with local communities and stakeholders, and capacity-building ability.
- A flexible project framework that adapts to new data sources, algorithms, and technological advancements and allows for iterative development and course correction based on initial results.

“Early identification of a potential bias by AI model and inclusion of affected population group in devising. Its solution should be the integral method for model development. A well-known example of this issue is the failure of face-tracking software to discern the differences between people with darker skin. This issue stems from the lack of training

data involving the darker skin tone population. Not including such minority groups in the development of the solution only further accentuates the bias,” Dr. Patil mentioned.

Most importantly, while AI can be a powerful tool, it should not replace human judgment and expertise in healthcare. The ideal scenario is a collaborative approach where AI assists doctors in diagnosis and treatment planning.

“Implementing AI-driven projects in global public health involves standardized project management best practices, ensuring cohesive cross-functional collaboration across diverse regions. Effective collaboration between public health experts and AI developers is paramount. Establish clear communication channels, facilitate interdisciplinary workshops, and promote a shared understanding of public health priorities. Regular feedback loops, ongoing collaboration, and a commitment to ethical considerations are essential for developing impactful and appropriate AI solutions that effectively address public health challenges,” Rudi added.

Summary: Public health AI projects face challenges beyond typical healthcare project management. These include ensuring data privacy across diverse public health agencies, addressing data quality and availability limitations in under-resourced settings, and navigating the complex ethical considerations surrounding public health data used in AI models.

Q 8: If you were to design one application of AI in healthcare, which one would that be?

“I would focus on a patient-facing application that can help triage patients based on the inputs to different levels of care with support tools and educational materials available where relevant. Much like an IT support model where basic troubleshooting is available within the system, a moderate level requires you to review certain resources and follow basic steps, and only when those items fail do you go to a service center. Over time, the triage model will improve to help build capacity and address the shortage and disproportionate distribution of healthcare resources,” Nikesh was quick to mention.

“Within the realm of Non-Communicable Diseases (NCDs), I would focus on AI projects offering personalized risk prediction, lifestyle interventions, and treatment optimization stand out. These initiatives hold significant promise for revolutionizing NCD management, ushering in a future where AI contributes to proactive and tailored healthcare strategies for improved public health outcomes,” Rudi added.

“It would be beneficial to have a language bridging tool (Think of a medical to common language, universal translator, and vice versa) between the healthcare provider and the patient. The focus should be on reducing medical jargon and making the communication between doctor and patient easily understandable. More often than not, a patient will unthinkingly put faith in doctors to make the correct decision rather than understanding the severity of the ailment and the long-term effect of treatment on the patient’s life. Health literacy tool kit that exchanges communication levels between a patient and a provider would reduce a significant miscommunication,” Dr. Patil mentioned.

Q 9: Would you like to add additional thoughts on this topic?

“AI holds promise for creating greater access to healthcare through innovations like predictive analytics, personalized treatment plans, and resource optimization. While these advancements can enhance care, equitable access is a critical concern. Addressing socioeconomic and regional disparities, ensuring affordability, and fostering inclusivity is paramount to preventing further health inequalities and guaranteeing that AI-driven healthcare benefits reach all affected populations,” Rudi mentioned.

Key Takeaways

Public health, a sector that can transform the health landscape of the planet, is about providing insights for targeted interventions (for example, epidemics and non-communicable diseases) and other health needs. If done correctly, AI can help in effective data-driven decision-making to support these focused interventions. AI can identify potential outbreaks and health disparities before they occur, allowing for proactive prevention measures. Integration of AI into healthcare project management for public health holds immense promise. By automating tasks, analyzing vast datasets, and predicting potential risks, AI empowers public health PMs to optimize resource allocation, streamline interventions, and ultimately improve population health outcomes.

That said, ethical considerations around data privacy, bias mitigation, and human oversight require careful attention. The future of public health lies in a collaborative approach where AI acts as a powerful tool, augmenting the expertise and compassion of public health professionals.

If done well, AI-enabled public health can majorly boost rural development. However, these projects lack the required sponsorship or advocacy, which could be the biggest bottleneck to their success. In addition, adaptation to new processes can pose challenges in rural settings and require a structured change management process. A few key takeaways for project managers for AI-enablement projects are as follows.

1. Understand your playing field: Understand the public health domain well to be resourceful and knowledgeable. Though a part of healthcare, public health can be challenging and different from routine healthcare.
2. Clearly define project objectives: Ensure that the project objectives are aligned with the overall goals of public health and AI integration.
3. Focus on emotional intelligence and leadership: AI currently falls short in exhibiting judgment, creativity, persuasion, and other intangible human skills that provide the human touch vital for successful public health initiatives.
4. AI can automate tedious tasks, freeing project managers to focus on strategic planning and community engagement, which are core to public health.

Disclaimer: The views and opinions expressed in this interview series are those of the speakers and do not necessarily reflect the views of any entities or associated parties. Proprietary names of AI applications have been avoided unless explicitly mentioned by the interviewees.

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About the Author



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Dr. Deepa Bhide, MBBS, DCH, PMP, has over 20 years of professional experience where she has blended medical practice and research with IT and Project Management. She juggles consulting, training, and operations and is proficient in clinical medicine, project management, and healthcare information technology. Starting her career as a medical practitioner, she has worked with varied organizations before her current stint as Vice President, Training, Clinical Support Solutions for Inventurus Knowledge Solutions.

Deepa's growing interest and work in these areas, born from her day-to-day patient interactions, helped her view Project Management as a backbone of progressive healthcare. Her paper on "Patient Care - A Project Management Perspective" has received global recognition and acclaim. With a physician background as a solid foundation to leverage IT/PM skills and knowledge, Deepa has blended her broad-based experience and learnings to present a unified, holistic, and wholesome view of Project Management and Healthcare, a cross-domain confluence. Through various webinars, events, talks, and writings across platforms, Deepa has been an evangelist in championing global project management during the COVID-19 pandemic.

A Gold medalist from Osmania University for standing First in the MBBS course, she pursued her DCH in Pediatrics and Child health. Deepa has served various roles in local and global Project Management Institute (PMI) regions. She remains actively engaged with PMI and has been a participant and speaker for various national and global meetings and online events.

Deepa lives in Hyderabad, India, and loves traveling, singing, and experimenting with global cuisine. She can be contacted at deepa.bhide@gmail.com.