

Health professionals and the AI revolution: A viewpoint

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Abstract

Artificial intelligence (AI) is reshaping public health and clinical practice, alongside the education and ethics that underpin them. As AI systems enter public health surveillance, clinical workflows, and decision-making, the responsibilities of health professionals across both population health and medicine must evolve to ensure ethical and equitable implementation. This viewpoint examines the responsibilities of health professionals in the AI era across linked domains: AI literacy, ethical oversight, interdisciplinary collaboration, and the effect of AI on decision-making and training in public health and clinical practice. It is framed around health-system readiness rather than technology alone, and gives particular attention to public health, epidemiology and surveillance, mental health care, and settings in low- and middle-income countries (LMICs).

AI presents both opportunities and risks for health systems. It can strengthen surveillance and outbreak response in public health, and diagnostics and decision support in clinical practice, but its performance is domain-specific and uneven, and it raises concerns about bias, privacy, accountability, and the depersonalisation of care. A conceptual framework maps how the responsibilities of health professionals are changing across public health, clinical practice, ethics, governance, education, patient communication, and interdisciplinary collaboration. AI will not replace health professionals, but it will change what competent practice requires. Addressing gaps in training, regulation, data quality, and digital infrastructure will help ensure that AI strengthens, rather than undermines, equitable and effective health care.

Keywords: Artificial intelligence, public health, health professions education, health equity, implementation science

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Perspective

Introduction

Public health professionals in every speciality, from epidemiologists and surveillance officers to biostatisticians, public health practitioners, and health informaticians, are increasingly aware of the effect that artificial intelligence (AI) is having on practice. The same is true in clinical care, where cardiologists, psychiatrists, and nurses find their work reshaped by data-driven decision-support tools. A large and growing literature now examines the capabilities of AI, its ethical challenges, and the changing roles of public health professionals and clinicians in a digitally enhanced health system [1,2].

For the purposes of this article, AI is defined broadly as computational systems that perform tasks ordinarily requiring human intelligence. The term covers machine learning, generative AI, expert systems, robotic process automation, predictive analytics, and robotics. Each carries distinct public health, clinical, ethical, and operational implications, and the concerns raised by generative models do not apply uniformly across this range [3]. Treating AI as a single object risks overgeneralisation, so this article distinguishes between application types throughout.

Many recent commentaries reiterate familiar themes: literacy, ethics, accountability, bias, training, and collaboration [1,4-6]. These themes are well established. The contribution of this viewpoint is not simply to revisit familiar themes but to connect them through a health-systems-readiness framework. Unlike commentaries that discuss AI literacy, ethics, governance, public health, and training as largely separate concerns, this article argues that these responsibilities evolve together and must be understood as interconnected components of health-system adaptation. By integrating public health, clinical care, mental health, education, governance, patient communication, and interdisciplinary collaboration within a single framework, the article offers a practical lens for understanding how professional responsibilities are changing in the AI era.

Mendhi and colleagues [1] set out responsibilities for health professionals in the AI era, spanning diagnostics, personalised medicine, the integration of machine learning into workflows, and the mitigation of bias. They identify a gap between current training and the skills clinicians need and call for curricular reform. This article takes their account as one useful starting point and places it alongside a wider body of work on clinician oversight, workflow integration, and algorithmic equity [2,4,5].

In public health and epidemiology, AI is increasingly applied to outbreak detection, surveillance analytics, predictive modelling, pathogen genomics, and health systems planning [7-10]. These tools can support earlier identification of threats and more responsive intervention.

They are particularly relevant in outbreak-prone and resource-constrained settings, where surveillance must operate with incomplete data and limited workforce capacity. Their value depends on data quality, contextual adaptation, and sustained professional oversight.

This viewpoint proceeds as follows. This article first sets out a conceptual framework that maps the evolving responsibilities of health professionals across domains. This article then examines AI in public health, epidemiology, and surveillance; clinical decision-making; mental health care; training and systems readiness; interdisciplinary collaboration; ethics and equity; and AI in lower-resource settings, before proposing a staged competency model and outlining the article's limitations.

A framework for evolving responsibilities

The framework in Table 1 operationalises the health-systems-readiness lens set out above. It turns that lens into seven concrete domains and, for each, contrasts the traditional focus with the responsibility that emerges in the AI era. It draws on responsible AI governance, implementation science, and the idea of digital professionalism, treating the health professional not as a passive user of AI but as an active agent across public health, clinical practice, ethics, governance, education, patient communication, and interdisciplinary work. The sections that follow develop these domains in turn, beginning with public health.

AI in public health, epidemiology, and surveillance

Public health is one of the clearest domains in which the responsibilities of health professionals are changing. In epidemiology and public health practice, AI can support surveillance, outbreak detection, disease modelling, risk stratification, resource allocation, and health communication. Recent public health scholarship frames AI as a tool that may strengthen surveillance, epidemiological research, communication, and the allocation of resources, while requiring attention to equity, accountability, privacy, infrastructure, workforce capacity, and environmental impact [8]. These benefits and harms do not fall evenly, so equity and ethics are not separable from the technical questions but central to them [9]. For a journal serving epidemiology and public health, these responsibilities sit at the centre of the discussion rather than at its margins.

In surveillance, AI systems can analyse large, heterogeneous data more quickly than manual methods, drawing on electronic records, laboratory and mortality data, syndromic and event-based signals, mobility data, and environmental sources. They can support anomaly detection, early warning, and short-term forecasting. Their value depends on data completeness, timeliness,

Table 1. Evolving Responsibilities of Health Professionals in the AI Era

Domain	Traditional focus	Evolving responsibility in the AI era
Public health and surveillance	Manual signal detection and reporting	Oversight of AI-supported surveillance and forecasting
Clinical practice	Diagnosis and treatment from history, examination, and tests	Critical appraisal of AI outputs and recognition of domain-specific performance limits
Ethics and accountability	Autonomy, beneficence, non-maleficence, justice	Address bias, explainability, consent, automation bias, and liability
Governance	Local clinical governance	Participation in AI procurement, validation, and oversight committees
Education and training	Apprenticeship and continuing education	AI literacy, critical appraisal, and defined competency frameworks
Patient communication	Shared decision-making	Explaining AI involvement and protecting the therapeutic relationship
Interdisciplinary collaboration	Referral and team working	Co-design with data scientists, engineers, and policymakers

Legend: The table summarises the traditional focus and evolving AI-era responsibility across seven professional domains.

interoperability, and local validation. AI should augment, not replace, the judgement of field epidemiologists, surveillance officers, and laboratory scientists, who remain responsible for interpretation and action.

AI also supports epidemiological modelling, helping to identify risk patterns, forecast transmission, and allocate scarce resources during outbreaks. Modelling outputs should be read with care. Models are not neutral; they depend on assumptions, input data, and context. For epidemiologists, AI also creates familiar methodological questions in new forms: selection bias, measurement error, missingness, confounding, external validity, and the difference between prediction and causal inference. A model may predict where risk appears high without explaining why that risk arises or which intervention will change it. In fragmented data systems, models deployed without local calibration and epidemiological oversight can amplify uncertainty rather than reduce it.

Two further areas are central to public health practice. In bioinformatics, computational tools support pathogen sequencing, variant classification, transmission-cluster detection, antimicrobial resistance monitoring, and molecular epidemiology, strengthening outbreak investigation but requiring governance of biological data and equitable access to analytic capacity [10]. From a One Health perspective, AI can model vector-borne disease risk, zoonotic spillover, and environmental determinants such as heat, air quality, and flooding, integrating human, animal, and environmental data for prevention. These applications are especially relevant in Africa and other regions facing combined pressures from outbreaks, climate change, and fragile surveillance infrastructure.

AI can also assist public health communication, tailoring messages across languages, literacy levels, and cultural contexts, and monitoring misinformation during outbreaks and vaccination campaigns. Such use carries risks of manipulation, exclusion, and loss of trust, so it must remain transparent, culturally grounded, and accountable to the populations it serves.

Large multi-modal models and public health responsibility

Generative AI and large multi-modal models deserve particular attention because they differ from narrower predictive systems. They can process text, images, and other inputs and generate diverse outputs across public health, clinical care, research, and communication [11]. In public health, they may summarise guidance, support multilingual communication, and assist interpretation, but they can also produce misinformation and fabricated outputs and perform unevenly across languages and populations.

For health professionals, the responsibility is not to master the technical architecture of these models but to judge when their use is appropriate and where human judgement must remain central. A model-generated outbreak summary, risk message, or evidence synthesis should be checked against epidemiological evidence, data quality, and local context. WHO guidance on large multi-modal models assigns duties to governments, developers, and providers; for professionals, it reinforces the central themes of this viewpoint, namely AI literacy that includes critical appraisal of generative outputs, ethical oversight that addresses automation bias and data protection, and interdisciplinary collaboration from design through

monitoring [11].

For public health institutions, the test is not whether AI is technically impressive but whether it improves population health equitably and sustainably. That depends on interoperable data systems, workforce training, data governance, cybersecurity, and partnerships across ministries of health, laboratories, environmental and veterinary services, and communities [12].

The evolution of decision-making in medicine

Beyond population health, AI is reshaping the individual clinical encounter. Clinical decision-making is being re-examined as AI takes on a larger role in diagnosis, treatment recommendation, and risk prediction [1]. Physicians traditionally combine heuristics and experience to interpret symptoms, order tests, and form plans. AI adds a layer of computational analysis that can detect patterns across large datasets.

This expanded role raises a clear question of accountability. When a model recommends an intervention, responsibility for the decision still rests with the clinician, who must appraise it as critically as a laboratory result or an imaging report [2]. Such appraisal requires awareness of the limits of AI, including bias in training data and the risk of overreliance. The strength of the evidence also varies by task. AI tools have matched specialists on narrow image-classification tasks in radiology and dermatology [13,14], but this performance should not be generalised to clinical reasoning, relational care, psychiatric assessment, or longitudinal management. Performance is domain-specific and depends on task type, population, context, and implementation setting. This article, therefore, distinguishes between demonstrated evidence, emerging applications, and aspirational claims and cautions against technological determinism that treats narrow success as system-wide transformation.

AI in mental health and psychiatric care

Psychiatry and mental health deserve specific attention, both because they are named among the affected specialties and because they expose the limits of automation. Digital and AI-driven tools are being developed for conditions including attention-deficit hyperactivity disorder, obsessive-compulsive disorder, schizophrenia, and substance use disorders, and for psychotherapy more broadly [15,16]. Early qualitative work reports that users value accessibility and personalisation, while raising concerns about the perception of therapeutic progress and the absence of a human relationship [17]. These findings matter because mental health care depends on the therapeutic alliance, empathy, and trust, which are difficult to reproduce computationally. AI may support triage, monitoring, and digital phenotyping, but it also introduces risks of

algorithmic stigma, misclassification, and harm to vulnerable groups. Responsible integration in this field requires explicit attention to consent, oversight, and protection of the clinician-patient relationship [18]. In LMIC settings, where the treatment gap for mental disorders is large, these tools may extend reach, but only where digital equity and access are addressed first [19].

Rethinking training and building systems readiness

Education for health professionals has been slow to keep pace with technological change. There is now broad agreement that AI literacy should become a core competency [1,20]. Students need grounding not only in clinical and public health skills but also in the fundamentals of data science, algorithmic reasoning, and the ethics of AI.

Curricular change of this kind raises practical questions about what to teach and where to teach it. Foundational training could extend beyond biology and chemistry to include computing and data ethics, and professional education could include exposure to bioinformatics and to the teams that build AI tools. Achieving this requires more than new content. It depends on institutional readiness, faculty preparedness, defined competency frameworks, and integration pathways into existing curricula and continuing professional development. Health professionals have a central part to play. As frontline users of AI tools and witnesses to gaps in training, they are well placed to advocate for the integration of AI competencies, engaging academic institutions, professional bodies, and health authorities so that these skills are taught systematically and aligned with practice.

Implementation science offers a useful frame for this transition. Adoption is shaped by governance structures, workflow fit, financing, and the capacity of health systems to maintain and audit tools over time. Treating AI literacy as a curricular addition alone, without attention to these system factors, is unlikely to succeed.

Interdisciplinary collaboration as a core responsibility

Interdisciplinary collaboration is often named as a goal and then left undeveloped. This article treats it as a substantive responsibility. Safe and useful AI in health is produced by teams, not by clinicians or engineers working in isolation. Clinicians and public health practitioners contribute knowledge of context, workflow, patient need, community trust, surveillance practice, and population risk; data scientists and engineers contribute technical design, data engineering, model validation, and monitoring; ethicists and lawyers address consent, liability, fairness, and rights; and policymakers and regulators set the conditions for deployment. Effective collaboration means involvement at every stage, from problem definition and dataset curation

Table 2. A Staged Competency Model for Health Professionals Working with AI

Stage	Competency	Indicative outcome
1	Foundational AI literacy	Can describe common AI types and their uses and limits in health care
2	Critical appraisal	Can evaluate an AI tool’s data source, validation, and applicability to a given population
3	Ethical and governance participation	Can contribute to procurement, oversight, and ethics review of AI systems
4	Interdisciplinary implementation	Can co-design and monitor tools with data scientists and policymakers in real settings
5	Patient communication	Can explain AI involvement to patients and protect the therapeutic relationship

Legend: The model presents staged competencies that can guide education, continuing professional development, and institutional readiness for AI use in health systems.

through procurement, validation, deployment, and post-market monitoring, rather than consultation after a tool has been built. In practice, this may mean multidisciplinary AI review committees, local validation teams, procurement panels with clinical and public health representation, and feedback mechanisms that allow frontline users to report unsafe outputs or workflow harms. This requires a shared vocabulary, agreed roles, and governance that gives public health and clinical staff genuine authority in procurement and oversight. Without such structures, collaboration remains rhetorical, and tools are poorly matched to the settings in which they are used.

Ethics and equity in AI-enabled health care

The use of AI in public health and clinical care raises ethical questions that exceed conventional clinical ethics. The familiar principles of autonomy, beneficence, non-maleficence, and justice remain relevant, but they must now address algorithmic bias, transparency, and the depersonalisation of care [6].

A central concern is that AI may entrench existing disparities. A model trained on data that under-represents certain populations may perform poorly for those groups and widen inequities rather than reduce them [5]. This risk is acute in LMICs, where health data infrastructure is uneven and where tools trained on high-income datasets may transfer badly. Ethical governance therefore, requires development and testing with diverse and representative populations.

Contemporary AI ethics extends further still. It includes explainability and the right to an account of automated decisions, informed consent for AI-assisted care, automation bias and the gradual deskilling of health professionals, ambiguity of liability when tools err, and the commercial conflicts of interest that accompany proprietary systems [21]. It also includes the transparency

of model validation, the environmental cost of large models, and concerns described as surveillance capitalism [22] and data colonialism [23], in which data flow from patients and from the Global South to private and Global North actors. Distributive justice asks who bears the costs of these systems and who receives their benefits. Health professionals have a duty to engage with these questions, to advocate for accountable and fair systems, and to protect patient privacy.

AI in lower-resource settings

Because this journal serves epidemiology and public health in Africa and other lower-resource regions, contextual fit deserves sustained attention rather than a single mention. Several factors shape whether AI helps or harms in these settings: infrastructure and connectivity, digital exclusion, linguistic and cultural diversity, workforce shortages, regulatory capacity, and the representativeness of training data. A reliance on datasets and models built in the Global North risks an epistemic dependence that poorly represents local realities [19]. Equity-focused reviews reach similar conclusions, identifying algorithmic bias across the AI lifecycle, the digital divide, unrepresentative datasets, and the dominance of particular linguistic and epistemic frames as central threats to equitable AI, and calling for sustained human oversight, intersectoral collaboration, and standardised governance [24]. Tools must therefore be validated locally, adapted to the context, and governed by local institutions. Equity is not an addition to AI in health; it is a precondition for safe use.

What should health professionals do?

Building on this analysis, health professionals can take concrete steps to ensure that AI is used responsibly and equitably. Rather than listing these as isolated actions, Table 2 presents them as a staged competency model,

pairing each stage with an indicative learning outcome so that capability builds in sequence.

Health professionals also help shape public understanding of AI in health. They are well placed to explain its benefits and risks to patients and to insist that AI support, rather than displace, the human relationship at the centre of care. Physicians, nurses, and public health leaders should take an active part in these debates.

Limitations

This article is a viewpoint. It does not present a systematic review or original data. It draws on selected literature to develop a conceptual argument, and its choices of emphasis, including public health, epidemiology, and surveillance, mental health, and lower-resource settings, reflect the interests of the author and the readership of this journal. The framework in Table 1 is offered as an organising device rather than a validated instrument.

Conclusions

AI will not replace health professionals, but it will change what competent practice requires. That change is constrained by gaps in training, uneven regulation, biased data, and unequal access to digital infrastructure, especially in lower-resource settings. Meeting these constraints calls for deliberate investment in education, governance, and equitable system design. Health professionals who engage critically and ethically with AI, across public health and clinical care, will be best placed to ensure that it strengthens rather than undermines safe, equitable, and humane care. The challenge is no longer whether health systems will adopt AI, but whether health professionals can shape that adoption in ways that protect equity, trust, accountability, and public value.

What is already known about this topic

- AI is increasingly used in clinical decision support, public health surveillance, epidemiological modelling, and health communication.
- Existing literature emphasises AI literacy, ethical oversight, accountability, bias, privacy, and interdisciplinary collaboration.
- AI performance varies by task, dataset, population, and implementation setting, and narrow diagnostic success should not be generalised across all areas of care.

What this viewpoint adds

- This viewpoint connects AI literacy, ethics, governance, training, public health, and collaboration through a health-systems-readiness framework.
- It strengthens attention to public health, epidemiology, surveillance, mental health care, and lower-resource settings.
- It proposes a staged competency model for health professionals working with AI across clinical and public health systems.

Author's Contribution

ENI conceptualised the article, selected and interpreted the literature, drafted the manuscript, revised it critically, and approved the final manuscript.

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Conflict of Interest Statement

The author of this work declares no competing interests.

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