Literature Review (GCC – Ethics)

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27/11/2025

Contents

Research Question

The broader project is looking into the ethical obligations/duty of care for donors & national governments regarding the usage of AI in health care and health policy? for Grand Challenges Canada (GCCC). This literature review specifically covers the area of possible methods ensuring ethical oversight for any AI related health solutions & policies. Thus, the main research question is: How can Governments/institutions in low-middle income countries ensure ethical oversight in AI related solutions for healthcare & health-related policies?

Methods

I began my search through ChatGPT as a starting point to give me a structured, introduction on how "ethical oversight of AI in health in LMICs" are being framed, and to help brainstorm an initial series of search terms & categories before I ever opened a database to conduct my search. Using these initial search terms as inspiration for refining my search terms, I began my search using Carleton's MacOdrum Library website, with initial search terms being general terms (i.e. "Artificial intelligence/machine learning, health policy. public health, developing countries, LMIC), I conducted a general overview & easy database access, to get an idea of core reference sources such as PubMed, ScienceDirect, then complementing it with targeted searches of WHO, EU and grey literature. I chose to search WHO & EU regulations and guidelines because they provide official-level benchmarks for health specific AI ethics & governance guidelines, and examples of a comprehensive, rights-based AI regulatory approach.

I then searched on google for scientific-health related academic blog sources for more recent and relevant opinions by health-related professionals and academics who have experience utilising AI within a health setting for opinions on advantages and drawbacks. Finally, I searched

PubMed, carefully refining & structuring my search term in blocks so that every component of my main research question is represented. I used more specific search terms to further refine & narrow my scope, using terms like: "low- and middle-income countr*, developing countr*, low-resource setting*, artificial intelligence, machine learning, automated decision, health system, health information system*, etc…" Throughout the testing and refinement of search terms, I would string the search block with "AND" to retrieve any articles that contained the combined search terms, further narrowing results, and "tiab" so that I can narrow down my search to relevant results, saving time, instead of a broader text search. The logic is that each bracketed search block corresponds to one core part of my research question.

Due to how rapidly AI in health evolves, I prioritised more recent years (post-2020) to capture modern machine learning & large-scale application, since older AI & ethics often doesn't accurately reflect nor capture the current realities or challenges. Simultaneously, I intentionally didn't restrict myself to peer-reviewed articles, since peer review is slow, and thus in particular, when reviewing AI policy & governance many of the most recent studies appear first in, institutional guidance, policy reports, and expert blogs. Thus, my search pattern game greater emphasis to grey literature and academic blog sites (i.e. AI4PEP, Bioethics Today, the BMJ Medical Ethics Blog) alongside academic databases such as ScienceDirect. These sources assisted in capturing emerging debates around AI in health such as duty of care, implementation challenges, and data equity concerns more accurately, which might have not filtered into peer reviewed journals. Finally, I vetted the sources individually thoroughly, further vetting the sources I've catalogued so that only the most relevant sources are used within this literature review.

Analysis of Evidence

Theme 1: Building context-sensitive governance and ethics capacity

One theme present throughout the sources is on how ethical oversight of AI within health should be less dependent on any one technical solution, instead building a robust locally grounded governance where AI governance responsibility is distributed, as stated in Global Forum on Bioethics in Research (GFBR) report emphasises how ethical AI within global health requires coordination governments, RECs, and international bodies instead of relying on any one actor[1]. Using WHO's 2021 guidance, they frame governance as "steering and rule-making" by various actors across various domains (i.e. data, benefit sharing, public/private partnerships & regulation), alongside how LMIC voices are underrepresented within global conversations[2]. This implies that ethical oversight isn't simply approving individual projects, but also shaping these broader rules, emphasising LMIC participation for international norm settings.

The articles consistently highlight how RECs are important but heavily strained component of the current ecosystem. RECs Institutional Review Boards are central for decisions on whether AI projects are ethical, yet most lack expertise & tools necessary to assess important areas (i.e. big data methods, cross border data flows, and opaque algorithms)[3]. Weaknesses within REC procedures combined with new AI specific challenges make it necessary to update REC functions in response to research involving AI[4]. Empirical work from Nigeria supports this where an initiative demonstrated how committees in five teaching hospitals are only just starting to encounter AI studies and feel unprepared to evaluates problems of algorithmic bias, cross border data sharing, and data reuse[5]. There's explicit demand for targeted capacity building &

[1] Shaw, James, et al. "Research Ethics and Artificial Intelligence for Global Health: Perspectives from the Global Forum on Bioethics in Research." BMC Medical Ethics, vol. 25, no. 1, 46, 2024, p. 1 – 5 https://doi.org/10.1186/s12910-024-01044-w.
[2] Ibid
[3] Shaw, James, et al. "Research Ethics and Artificial Intelligence for Global Health: Perspectives from the Global Forum on Bioethics in Research."
[4] Ibid
[5] Olawade, David B., et al. "Ethical Oversight of Artificial Intelligence in Nigerian Healthcare: A Qualitative Analysis of Ethics Committee Members' Perspectives on Integration and Regulation." International Journal of Medical Informatics (Shannon, Ireland), vol. 206, 106140, 2026, https://doi.org/10.1016/j.ijmedinf.2025.106140.

clearer national guidelines on AI research[6]. Similar concerns appear within companion studies of consultant physicians, where doctors see potential benefits of AI in diagnosis & efficiency, it's repeatedly pointed out that there's a persistent barrier of inadequate infrastructure, liability uncertainty, and weak regulatory oversight making responsible use harder[7]. These studies suggest that without investments in REC training, updated SOPs, and clear national policies & regulations, LMIC health systems risks blocking useful AI systems out of extreme caution or, approving AI projects without fully grasping risks[8]. The GFBR paper also warns of ethics dumping &health data colonialism, where high income countries utilise ethically contentious AI research policies and/or largescale data extraction methods within LMICs countries to escape stricter domestic oversight[9]. Since algorithms train on data from high income countries, they often fail within LMIC settings, raising legal concerns and also directly harms clinical operational quality and reinforces inequities[10].

One study suggests nine governance leadership strategies, which are: Staying up-to-date with rapidly evolving AI regulations, robust health data policies, compulsory community engagement, incentivising fairer North-South partnerships, experimenting with regulatory sandboxes, and improving governance structures to allow better access to AI expertise[11]. For LMICs, regulatory sandboxes, controlled environments for algorithm testing under close surveillance are highlighted as potential ways of building regulators' technical understandings whilst protecting patients[12]. The wider ethics literature reinforces this from high level principles to operational governance, where one study scoped out 103 records on AI for good health

[6] Ibid
[7] Olawade, David B., et al. "Perceptions and Challenges of Artificial Intelligence Adoption in Nigerian Public Healthcare: Insights from Consultant Doctors across Five Tertiary Hospitals." Clinical Epidemiology and Global Health, vol. 36, 102200, 2025, https://doi.org/10.1016/j.cegh.2025.102200.
[8] Ibid
[9] Shaw, James, et al. "Research Ethics and Artificial Intelligence for Global Health: Perspectives from the Global Forum on Bioethics in Research."
[10] Ibid
[11] Ibid
[12] Ibid

governance found that most ethics work within AI in health settings was purely conceptual, with minimal detailed tools that RECs or government ministries within LMICs could actually use[13]. The research, along with the other pieces focusing on the Global South emphasises how the ethical deployment requires adapting governance structure to take into account local legal systems, political realities, and resource constraints instead of importing checklists within high income contexts[14].

The article on AI and big data analytics for clinical and public health in the Global South also notes how most AI empirical evidence & standards are generated in the Global North, despite evidence on how the findings often don't translate cleanly to LMICs[15]. The authours emphasise a social & ethical policy of responsibility, inclusivity, and collaborative/participatory structure for AI rooted in locally relevant datasets, with trained personnel & infrastructure. Importantly, responsible AI is defined in terms of fairness, inclusivity, transparency, accountability, explainability, and human centred values that are implemented within national regulations, procurement rules, and research funding criteria[16]. AI4PEP related materials and the Frontiers in Medicine scoping review pushes this idea further by observing health system transformation[17]. An example is research highlighting 40 challenges & 89 recommendations for AI use in strengthening health systems within LMICs across various domains such as regulation & legal frameworks, workforce education, financing, and data infrastructure[18]. The research stresses that many AI projects are still at the piloting stage, with very few examples of

[13] Murphy, Kathleen, et al. "Artificial Intelligence for Good Health: A Scoping Review of the Ethics Literature." BMC Medical Ethics, vol. 22, no. 1, 14, 2021, https://doi.org/10.1186/s12910-021-00577-8
[14] Ibid
[15] Kong, J. D., Akpudo, U. E., Effoduh, J. O., & Bragazzi, N. L. Leveraging responsible, explainable, and local artificial intelligence solutions for clinical public health in the Global South. Healthcare, 11(4), 457. 2023. https://doi.org/10.3390/healthcare11040457
[16] Ibid
[17] Ibid
[18] Hailu KT, Haddad RR. Structural Barriers and the Future of AI in Global Health: Lessons From Eradicable Diseases. Cureus. 2025 Sep 11;17(9):e92061. doi: 10.7759/cureus.92061. PMID: 41080349; PMCID: PMC12514987.

sustainable integration into health system governance structures[19]. Combining all of this, the common theme is that ethical oversight for AI in LMICs is fundamentally about institutional capacity & political will. Governments & health institutions need to strengthen and upskill RECs/IRBs to handle AI specific problems through regional training networks & formal connections with data science experts[20]. The development/updating of AI specific laws & regulations regarding data protection, medical devices, liability, and procurement, alongside utilising tools such as impact assessments & sandboxes to learn while protecting patients[21]. Greater protections against ethics dumping & data colonialism through stricter cross border data governance rules & explicit benefit sharing requirements[22]. Insistence on fair, participatory partnerships so that AI projects are codesigned with local clinicians, communities, and regulators input[23]. In short, the evidence emphasises a governance focused approach.

Theme 2: Data inequities, fairness and contextual bias in health

Another common theme present in the articles is how ethical oversight in LMICs has to start from how data is produced, who's needs shape the AI models, and how fairness is contextually defined. The literatures repeatedly demonstrate how current AI systems are built on structurally unequal data & research ecosystems, meaning LMIC regulators have to actively correct the data for imbalances. Several papers describe this trend as health data poverty. The paper on rapid communication on Global South led responsible AI highlights how as more AI tools are deployed into low resource settings, the training of said tools will continue struggling with health data poverty, which is a scarcity of data adequately representing local populations[24].

[19] Ibid
[20] Shaw, James, et al. "Research Ethics and Artificial Intelligence for Global Health: Perspectives from the Global Forum on Bioethics in Research."
[21] Ibid
[22] Ibid
[23] Ibid
[24] Sinha C. Global South-led responsible AI solutions to strengthen health systems: an emergent research landscape. Oxf Open Digit Health. 2025 Jul 8;3. p. 2-3 :oqaf016. doi: 10.1093/oodh/oqaf016. PMID: 40697670; PMCID: PMC12282117.

The paper links this to deep underlying vulnerabilities where more than 400 million people lack access to essential health services, and much of the most pressing conditions within the Global South are under documented in digital forms[25]. The case studies on ultrasound access for Indigenous women in Guatemala, perinatal depression screenings in Bangladesh, and community-based polio surveillance within Ethiopia demonstrate how implementation research is used to adapt AI to local realities instead of assuming that high income datasets will work in every setting[26]. Hailu & Haddad's paper on structural barriers in global health makes a similar point with empirical numbers: in 2020, LMICs received only 0.2% of all global health research grants, while high income countries had around 56 times more health researchers per capita[27]. Cancer trials showed a higher gap with roughly 7.05 trials per 100 thousand prevalent cases within high income settings vs 0.15 in LMICs, a 100 times greater difference relative to disease burden[28]. The paper argues that if existing, proven health tools aren't reaching people due to these systemic inequities, AI won't be distributed fairly either, and will likely follow a similar pattern of under investment & exclusion[29].

This connects directly to algorithmic biases & distributive justice where Murphy's review of 103 ethics papers on "AI for good health" explains how algorithms inherit the values & implicit biases of its designers, which often reflect wider societal inequities[30]. She demonstrates how unrepresentative/incomplete training datasets can produce outputs that only reflect certain groups while excluding others, and that biased datasets risk perpetuating racial, gender, and various other demographic inequities while simultaneously weakening diagnostic performance of

[25] Ibid
[26] Ibid
[27] Hailu KT, Haddad RR. Structural Barriers and the Future of AI in Global Health: Lessons From Eradicable Diseases. Cureus.
[28] Ibid
[29] Ibid
[30] Murphy, Kathleen, et al. "Artificial Intelligence for Good Health: A Scoping Review of the Ethics Literature."

the AI due to its inability to adapt to the populations it's applied to[31]. The review also notes how well-designed AI can mitigate some human cognitive such as reducing recency/anchoring bias in clinical setting, but only if systems are deliberately built to meet existing ethical standards & involves a multidisciplinary, participatory design process[32]. The Lancet review on AI cautions that without this kind of work, AI may risk encoding socioeconomic & gender biases already present within health systems[33]. The review emphasises how most AI interventions in LMICs are developed with limited local input, and how research agendas within LMIC settings are frequently driven by donor priorities instead of local health system needs[34]. Hussain & colleagues' review on AI in the Global South echoes this as well, where they described AI as having unprecedented potential to advancing global health equity, but stressed that this potential is constrained by economic, infrastructure, and surveillance barriers in low-resource settings[35]. Importantly, they note that digitising health data for populations currently missing from current algorithm development is essential if AI is going to meet the needs of medically underserved & marginalised groups[36].

Frontline perspectives from LMICs reinforces this notion, with the Nigerian consultant doctor study reporting how clinicians have secondary data concerns including privacy, trust, and the possibility that AI generated outputs are potentially unfair to the real medical staff if used uncritically[37]. The companion paper on Nigerian ethics committee members talks about anxiety for potential of errors, misdiagnosis, and misuse, highlighting the importance of patient safety

[31] Ibid
[32] Ibid
[33] Schwalbe, Nina, and Brian Wahl. "Artificial Intelligence and the Future of Global Health." The Lancet (British Edition), vol. 395, no. 10236, 2020, pp. 1579–86, https://doi.org/10.1016/S0140-6736(20)30226-9.
[34] Ibid
[35] Hussain SA, Bresnahan M, Zhuang J. Can artificial intelligence revolutionize healthcare in the Global South? A scoping review of opportunities and challenges. Digit Health. 2025 Jun 30;11:20552076251348024. doi: 10.1177/20552076251348024. PMID: 40605996; PMCID: PMC12214331.
[36] Ibid
[37] Olawade, David B., et al. "Ethical Oversight of Artificial Intelligence in Nigerian Healthcare: A Qualitative Analysis of Ethics Committee Members' Perspectives on Integration and Regulation."

when staff aren't familiar with AI tools[38]. Meanwhile, a review of nurses' perspectives on AI found that ethical issues, especially patient data security & privacy are seen as major barriers to adoption of AI in 7/9 studies reviewed[39]. Nurses in multiple countries raised concerns on how biased AI tools may potentially lead to unfair & unequal care for specific margialised groups, while worsening existing disparities amongst vulnerable populations[40].

Other articles emphasise fairness beyond data, and into sustainability & cultural appropriateness. The IJERPH review on AI assisted mental health interventions defined sustainability as not just an economic viability, but also as a social equity via cultural appropriateness & community acceptance, defining AI under a broad agenda of task sharing, capacity building, and integrating mental health into development initiatives[41]. Kong's paper on AI and big data analytics for clinical public health within the Global South also mentions how socioeconomic inequalities & climate related risks shape who gets sick, arguing that AI driven early warning systems need guidance from locally informed policies to avoid deepening inequalities[42]. The papers highlight a need for locally informed models, adaptable modelling frameworks, clear communication on model limitations, and stronger AI & data science capacity within the Global South[43]. Sinha's Oxford Open Digital Health piece adds that individuals excluded from discussions on the governance & regulating of AI carry the greatest risks of discrimination and marginalisation, especially groups already experiencing deep structural & systemic inequalities[44]. The blog pieces highlight how in healthcare related AI discussions

[38] Olawade, David B., et al. "Perceptions and Challenges of Artificial Intelligence Adoption in Nigerian Public Healthcare: Insights from Consultant Doctors across Five Tertiary Hospitals." Clinical Epidemiology and Global Health
[39] Joo, Jee Young, et al. "Nurses' Perceptions of Artificial Intelligence Adoption in Healthcare: A Qualitative Systematic Review." Nurse Education in Practice, vol. 88, 104542, Elsevier Ltd, 2025, https://doi.org/10.1016/j.nepr.2025.104542.
[40] Ibid
[41] Espino Carrasco DK, Palomino Alcántara MDR, Arbulú Pérez Vargas CG, Santa Cruz Espino BM, Dávila Valdera LJ, Vargas Cabrera C, Espino Carrasco M, Dávila Valdera A, Agurto Córdova LM. Sustainability of AI-Assisted Mental Health Intervention: A Review of the Literature from 2020-2025. Int J Environ Res Public Health. 2025 Sep 4;22(9):1382. doi: 10.3390/ijerph22091382. PMID: 41007526; PMCID: PMC12469610.
[42] Kong, J. D., Akpudo, U. E., Effoduh, J. O., & Bragazzi, N. L. Leveraging responsible, explainable, and local artificial intelligence solutions for clinical public health in the Global South. Healthcare
[43] Ibid
[44] Sinha C. Global South-led responsible AI solutions to strengthen health systems: an emergent research landscape.

simply define fairness as an issue without specifying what conception of justice is being used to define it, or how it translates into design choices & evaluation criterias for models. Additionally, the blogs argue that in time sensitive environments, the necessity of complex, explainable AI interfaces might harm patients by distracting clinicians or delaying urgent decisions, with calls for a balanced approach with the realities of clinical workflow[45]. Finally, the Bioethics Today blog on language within large language AI models warns that LLM outputs reflect linguistic norms & power structures in their training data, causing misunderstanding on how the systems utilising language can reinforce miscommunication & inequity for language minority communities[46].

Taken together, these sources suggest that for LMIC governments & institutions, ethical oversight of AI and data injustice are interwoven. Oversight has to address structural gaps on who generates health data & gets represented within algorithms, require model developers to demonstrate that the models perform fairly & adequately for local populations, mandating stronger privacy & security protections, and adopting explicit, context appropriate definitions of fairness & justice. Without these steps, the literature implies that AI risks amplifying existing inequities instead of helping to close them.

Theme 3: Keeping care human: trust, relationships, and sustainable implementation

A third theme from all the articles is on how ethical oversight within LMICs must protect how medical care feels for patients & professionals. The Nigerian consultant doctor study shows how doctors recognised that AI can improve diagnostics & efficiency, but they were also concerned that overreliance on AI might erode core facets of medicine, the doctor–patient

[45] Pruski, M. Musings on artificial intelligence, fairness and conceptions of justice to help with implementation considerations. Journal of Medical Ethics Blog. 2024, March 4. https://blogs.bmj.com/medical-ethics/2024/03/04/musings-on-artificial-intelligence-fairness-and-conceptions-of-justice-to-help-with-implementation-considerations/

[46] Youssef, A., Stein, S., Clapp, J., & Magnus, D. The importance of understanding language in large language models. Bioethics Today. 2023, October 19. https://bioethicstoday.org/blog/the-importance-of-understanding-language-in-large-language-models/

relationship[47]. One theme in their interviews was a concern of diminishing human interaction & potential de-personalisation of healthcare, stressing that health care is built on trust, empathy, and personalised care, insisting that AI should be validated by a human clinician always, and also raised fears of misdiagnosis if medical staff trusted AI more than their own skills, especially in low resourced medical facilities/hospitals where there's limited redundancy if something went wrong[48].

The companion study with Nigerian REC members echoed these concerns, with members being aware of the benefits, but admitted that they have limited experience reviewing AI protocols, feeling unprepared to judge complex AI tools[49]. They raise concerns about AI safety, error/misuse, and that protecting patient safety & human dignity must be central to AI in healthcare[50]. For LMIC regulators, this means that ethical oversight needs to address if AI will support or undermine the relationships & trust that ensure safe medical care. The review on nurses' perceptions of AI adoption makes the same point but from a different angle[51]. Nurses reported anxiety that AI tools might increase their workload, such as requiring extra documentation & monitoring, and that they needed substantial training time to learn how new systems work[52]. They also emphasised that AI should optimise instead of replacing real nursing care, arguing that their clinical experience & intuition are irreplaceable, especially with complex patients[53].

[47] Olawade, David B., et al. "Ethical Oversight of Artificial Intelligence in Nigerian Healthcare: A Qualitative Analysis of Ethics Committee Members' Perspectives on Integration and Regulation."
[48] Ibid
[49] Olawade, David B., et al. "Perceptions and Challenges of Artificial Intelligence Adoption in Nigerian Public Healthcare: Insights from Consultant Doctors across Five Tertiary Hospitals." Clinical Epidemiology and Global Health
[50] Ibid
[51] Joo, Jee Young, et al. "Nurses' Perceptions of Artificial Intelligence Adoption in Healthcare: A Qualitative Systematic Review."
[52] Ibid
[53] Ibid

The mental health focused articles add the layer of longterm sustainability & therapeutic relationships. The IJERPH review defines sustainability broadly as encompassing various dimensions (i.e. economic viability, environmental impact, and social sustainability) via cultural appropriateness & community acceptance[54]. The review cautions that most AI mental health tools are short-term pilot systems with limited evaluation, and that without attention to structural inequalities & community trust, there's a risk of deepening the digital divide[55]. Strategies identified discuss task sharing with non-specialist workers, careful scaling of successful programs, and explicit efforts to avoid surveillance, exploitation, and culturally inappropriate content which AI risks doing[56]. The JMIR review for mental health has similar conclusions, discussing how conversational agents can, in theory, provide 24/7 support, psychoeducation, and behavioural coaching at low cost, which would be usefl in LMICs with few trained clinicians[57]. However, the review also documents significant challenges highlighting how most systems undergo small/short-term trials, contain limited data on clinical outcomes & variable user engagement[58]. More interactive/embodied AI agents appear more successful at building trust while others feel impersonal or confusing[59]. The authours note concerns on data privacy, safety under crises, and risks of AI chats being cheap substitute replacements for real human care without adequate safeguards[60].

[54] Espino Carrasco DK, Palomino Alcántara MDR, Arbulú Pérez Vargas CG, Santa Cruz Espino BM, Dávila Valdera LJ, Vargas Cabrera C, Espino Carrasco M, Dávila Valdera A, Agurto Córdova LM. Sustainability of AI-Assisted Mental Health Intervention: A Review of the Literature from 2020-2025. Int J Environ Res Public Health.
[55] Ibid
[56] Ibid
[57] Anisha SA, Sen A, Bain C. Evaluating the Potential and Pitfalls of AI-Powered Conversational Agents as Humanlike Virtual Health Carers in the Remote Management of Noncommunicable Diseases: Scoping Review. J Med Internet Res. 2024 Jul 16;26:e56114. doi: 10.2196/56114. PMID: 39012688; PMCID: PMC11289576.
[58] Ibid
[59] Ibid
[60] Schwalbe, Nina, and Brian Wahl. "Artificial Intelligence and the Future of Global Health."

Other papers show that these human centred worries aren't limited to mental health. The Lancet review argues that ministries & donors require extensive technical literacy to make sound ethical & evidence-based decisions about new technologies, emphasising that AI needs to support, not replace, human health workers in fragile systems. The article on AI and big data analytics for clinical public health in the Global South stressed that early warning & surveillance systems will only work if they are trusted & used by local human professionals & communities otherwise, sophisticated AI models may be unused or fuel mistrust if communication isn't clear[61]. Additionally, the digital health scoping review for Vietnam notes that effective use of AI enabled tools requires strong governance of patient privacy & security, user-friendly design, and digital literacy for both patients & health workers[62]. Without these, interventions aimed at reducing noncommunicable disease risk factors may worsen inequalities because only better off & connected communities can use them[63].

The blogs discuss practical rather than purely theoretical ethics, with Pruski's BMJ Medical Ethics piece on fairness pointing out that different conceptions of justice (i.e. equal treatment vs priority) can lead to different design & triage choices, meaning implementers need to be clear on what values they're enacting when deploying AI systems[64]. Wabro's blog on explainable AI (XAI) discusses how in time-sensitive environments, complicated explanation interfaces can harm patients if they overload clinicians or delay urgent care decisions, while in some acute settings, a well validated AI black box may be safer than a poorly designed,

[61] Kong, J. D., Akpudo, U. E., Effoduh, J. O., & Bragazzi, N. L. Leveraging responsible, explainable, and local artificial intelligence solutions for clinical public health in the Global South. Healthcare,
[62] Kosowicz L, Tran K, Khanh TT, Dang TH, Pham VA, Ta Thi Kim H, Thi Bach Duong H, Nguyen TD, Phuong AT, Le TH, Ta VA, Wickramasinghe N, Schofield P, Zelcer J, Pham Le T, Nguyen TA. Lessons for Vietnam on the Use of Digital Technologies to Support Patient-Centered Care in Low- and Middle-Income Countries in the Asia-Pacific Region: Scoping Review. J Med Internet Res. 2023 Apr 5;25:e43224. doi: 10.2196/43224. PMID: 37018013; PMCID: PMC10132046.
[63] Ibid
[64] Pruski, M. Musings on artificial intelligence, fairness and conceptions of justice to help with implementation considerations.

distracting XAI system[65]. Furthermore, misunderstandings on how large language models handle language probabilities can cause misleading impressions, which has serious implications for informed consent, patient communication, and trust for LLMs[66].

Overall, ethical oversight in LMICs must protect human relationships & long-term service quality. This means requiring evidence on how AI tools support therapeutic relationships & patient trust instead of replacing/undermining them[67]. Building proper training, supervision and support systems for healthcare workers so that they aren't simply given new tools without time or resources to adapt[68]. Evaluating sustainability within social & cultural aspects, community acceptance, equity, and fit with local care practices in mind alongside the technical performance and cost[69]. Being realistic about which areas of care explainability helps clinicians & where it may overwhelm.

Policy Response Relevance & Gap

From the policy responses, overall, it seems like the general direction international bodies are headed towards (i.e. WHO, EU) are heading in a similar direction as the evidence from the articles where there is an emphasis on multi actor governance, equity focused data rules, and strong human oversight for AI policy responses and can be proken down into 3 main areas:

1. *Shared focus on governance & institutional responsibility:* The WHO's 2021 Ethics & governance of AI for health establishes 6 high-level principles (protecting autonomy,

[65] Wabro, A. Could XAI harm patients in time-sensitive environments? Journal of Medical Ethics Blog. 2024, September 19 https://blogs.bmj.com/medical-ethics/2024/09/19/could-xai-harm-patients-in-time-sensitive-environments/
[66] Youssef, A., Stein, S., Clapp, J., & Magnus, D. The importance of understanding language in large language models.
[67] Olawade, David B., et al. "Perceptions and Challenges of Artificial Intelligence Adoption in Nigerian Public Healthcare: Insights from Consultant Doctors across Five Tertiary Hospitals." Clinical Epidemiology and Global Health, Joo, Jee Young, et al. "Nurses' Perceptions of Artificial Intelligence Adoption in Healthcare: A Qualitative Systematic Review."
[68] Joo, Jee Young, et al. "Nurses' Perceptions of Artificial Intelligence Adoption in Healthcare: A Qualitative Systematic Review.", Murphy, Kathleen, et al. "Artificial Intelligence for Good Health: A Scoping Review of the Ethics Literature."
[69] Kong, J. D., Akpudo, U. E., Effoduh, J. O., & Bragazzi, N. L. Leveraging responsible, explainable, and local artificial intelligence solutions for clinical public health in the Global South. Healthcare, Espino Carrasco DK, Palomino Alcántara MDR, Arbulú Pérez Vargas CG, Santa Cruz Espino BM, Dávila Valdera LJ, Vargas Cabrera C, Espino Carrasco M, Dávila Valdera A, Agurto Córdova LM. Sustainability of AI-Assisted Mental Health Intervention: A Review of the Literature from 2020-2025. Int J Environ Res Public

promote wellbeing, ensuring transparency, fostering accountability, ensuring inclusiveness & equity, and promoting responsive, sustainable AI), turning them into concrete governance tasks for governments, regulators, developers, and healthcare providers[70]. The newer 2024 guidance on LMMs goes further, spelling out 40+ recommendations for governments, tech companies, and healthcare providers, and identifying governments as having the primary responsibility for standards, regulation, and oversight[71]. This matches closely with literature discussed with common calls for governments to coordinate regulators, RECs, funders & implementers, and investing into REC capacity & legal frameworks. The Nigerian REC & clinician studies show on the ground demands for the guidance & capacity building regulations the WHO offering. The EU's AI Act takes a similar approach, using a risk-based model where "high-risk" AI systems (I.e. AI software intended for medical purposes) must comply with requirements including risk mitigation, clear user information, high quality data sets, and clear human oversight[72]. That is very close to what the articles recommend in treating AI in health settings as structurally high risk, surrounding it with robust rules, and ensuring regulators have real tools (risk management, documentation, liability rules) instead of vague principles[73].

2. *Alignment on fairness, equity and data governance:* The WHO repeatedly warns how AI can reinforce/worsen inequities if trained on biased data or utilised in weak healthcare systems, explicitly framing equity as a core ethical principle[74]. The LMM document

[70] World Health Organization. (2021). *Ethics and governance of artificial intelligence for health: WHO guidance*. World Health Organization. https://iris.who.int/handle/10665/341996
[71] World Health Organization. WHO releases AI ethics and governance guidance for large multi-modal models. 2024, January 18. https://www.who.int/news/item/18-01-2024-who-releases-ai-ethics-and-governance-guidance-for-large-multi-modal-models
[72] European Commission. Artificial Intelligence in healthcare. https://health.ec.europa.eu/ehealth-digital-health-and-care/artificial-intelligence-healthcare_en
[73] Shaw, James, et al. "Research Ethics and Artificial Intelligence for Global Health: Perspectives from the Global Forum on Bioethics in Research."
[74] World Health Organization. (2021). *Ethics and governance of artificial intelligence for health: WHO guidance*.

highlights risks of privacy breaches, misinformation, concentration of power in a handful of companies, and the exclusion of low resource settings from training data & governance processes[75]. This aligns with the theme of data justice highlighting the risks of health data poverty & research funding gaps in the global south, and arguments that biased datasets hardwire social injustices into AI systems[76]. The sources emphasise a need for locally relevant data, fair partnerships, and safeguards against ethics dumping. WHO's guidance state how governments must set rules for data governance, IP, benefit sharing, and private sector oversight[77]. The EU requires high quality datasets for high-risk systems to reduce bias & protect fundamental rights, and the EU Health Data Space enables secure secondary usage of data while giving patients strong control rights[78].

3. *Human-centred care:* Both WHO & EU are explicit about humans having control. WHO emphasises preservation of professional responsibility, human oversight, and protecting the doctor patient relationship & informed consent processes when AI is used[79]. The LMM guidance warns about overreliance on chatbots/generative models in clinical decision making, calling for clear definitions & escalation pathways[80]. The EU's AI Act also highlights that high-risk systems need human oversight, clear user instructions, and safeguards allowing clinical oversight of AI outputs rather than blind rubber stamping[81]. That's exactly what's shown the sources empirical work, specifically in the Nigerian doctor's study where there is great emphasis saying AI must never replace clinical

[75] World Health Organization. (2024). Ethics and governance of artificial intelligence for health: Guidance on large multi-modal models. World Health Organization. https://iris.who.int/server/api/core/bitstreams/e9e62c65-6045-481e-bd04-20e206bc5039/content
[76] Goodman KW, Litewka SG, Malpani R, Pujari S, Reis AA. Global health and big data: The WHO's artificial intelligence guidance. S Afr J Sci. 2023 May-Jun;119(5-6):14725. doi: 10.17159/sajs.2023/14725. Epub 2023 May 30. PMID: 39328373; PMCID: PMC11426405.
[77] Ibid
[78] European Commission. Artificial Intelligence in healthcare.
[79] World Health Organization. (2021). *Ethics and governance of artificial intelligence for health: WHO guidance*. World Health Organization.
[80] World Health Organization. (2024). Ethics and governance of artificial intelligence for health: Guidance on large multi-modal models.
[81] European Commission. Artificial Intelligence in healthcare.

judgement[82]. Additionally, the nurse study insists AI should be used to optimise not replace nursing, and mental health studies concerned about therapeutic alliances and the XAI blog warning that explanations must be helpful to clinicians[83]. The policy responses from supranational bodies are all essentially codifying these frontline concerns into legal & ethical requirements.

The most notable policy gaps can be summarised into 3 main points:

1. *Limited LMIC & public health focused ethics work:* All of the research points to how papers on AI ethics found that most discussion on ethics is still concentrated in high income countries. Only 5.8% of the reviewed literature had authours from LMICs, with significant gaps for work on ethical challenges of AI in LMICs & in public health more broadly (i.e. screening programmes, surveillance)[84]. Equity is also frequently mentioned but rarely analysed indepth with little systematic work on how AI could widen or narrow gaps in health outcomes between & within countries within the blogs and sources.
2. *Weak empirical & implementation evidence in LMIC settings:* Various sources highlight how there's still not enough knowledge on implementing AI ethically & sustainably in real health systems, especially in low resource settings. The scoping review on AI found that most studies are experimental machine learning models, with few actually deployed, and the ones that were tended to be small scale mobile pilot projects with limited evaluation on long-term health outcomes or equity impacts[85]. Systematic review of sustainable AI assisted mental health interventions makes a similar case on limited

[82] Olawade, David B., et al. "Ethical Oversight of Artificial Intelligence in Nigerian Healthcare: A Qualitative Analysis of Ethics Committee Members' Perspectives on Integration and Regulation."
[83] Wabro, A. Could XAI harm patients in time-sensitive environments? Journal of Medical Ethics Blog.
[84] Murphy, Kathleen, et al. "Artificial Intelligence for Good Health: A Scoping Review of the Ethics Literature."
[85] López DM, Rico-Olarte C, Blobel B, Hullin C. Challenges and solutions for transforming health ecosystems in low- and middle-income countries through artificial intelligence. Front Med (Lausanne). 2022 Dec 2;9:958097. doi: 10.3389/fmed.2022.958097. PMID: 36530888; PMCID: PMC9755337.

empirical evidence on long-term effectiveness, with many tools lacking rigorous stress tests, and calls for longitudinal studies in resource limited settings examining both outcomes & cultural adaptability long-term[86]. The absence of comprehensive sustainability frameworks/indicators assessing economic, environmental, and social dimensions of AI interventions is also noted. In short, there's lots of theoretical promise & small pilots, however not much robust implementation to see what truly works at scale & under real constraints.

3. *Narrow range of stakeholder perspectives & contexts:* The Nigerian ethics study is explicitly framed as filling a critical knowledge gap since there had been no previously documented AI perspectives from LMIC REC members[87]. However, that study notes its own limits on how the study was conducted: with around 10 participants from teaching hospital committees from one region, no input from nurses, frontline clinicians, IT staff, administrators& patients, and no coverage of other regions or lower-level medical facilities[88]. Future work needs to include these missing groups & settings. Other reviews echo this with LMIC implementation papers often describing technical performances but saying relatively little about patient experiences, community perceptions, or how AI affects trust within health services.

Conclusion

This literature review demonstrates how ethical oversight of AI within health in LMIC settings can't be summarised into technical accuracy or narrow risk management. Instead, the

[86] Kong, J. D., Akpudo, U. E., Effoduh, J. O., & Bragazzi, N. L. Leveraging responsible, explainable, and local artificial intelligence solutions for clinical public health in the Global South. Healthcare, Espino Carrasco DK, Palomino Alcántara MDR, Arbulú Pérez Vargas CG, Santa Cruz Espino BM, Dávila Valdera LJ, Vargas Cabrera C, Espino Carrasco M, Dávila Valdera A, Agurto Córdova LM. Sustainability of AI-Assisted Mental Health Intervention: A Review of the Literature from 2020-2025. Int J Environ Res Public

[87] Olawade, David B., et al. "Perceptions and Challenges of Artificial Intelligence Adoption in Nigerian Public Healthcare: Insights from Consultant Doctors across Five Tertiary Hospitals."

[88] Ibid

studies collectively highlight three interconnected priorities: building context sensitive governance capacity, addressing systemic data injustices, and protecting human relationships & trust as the core of care. Within the broader project, my component does two things: Firstly, it grounds the research with real world experiences instead of abstract principles through testimonies and analysis from REC members, clinicians, nurses, mental health users, and global health actors. It demonstrates where existing frameworks (i.e. WHO, EU, national policies) already respond to LMIC needs. Secondly, it identifies clear gaps & leverage points for future work, such as the lack of country level case studies, limited evidence for sustainable implementation models, and a limited empirical base for how AI affects equity & trust in routine healthcare services. Combined, these insights position the wider project to moving beyond generic AI ethics language & more towards concrete, context aware proposals that LMIC governments & institutions could realistically use when designing, testing, and governing AI enabled health policies & solutions.

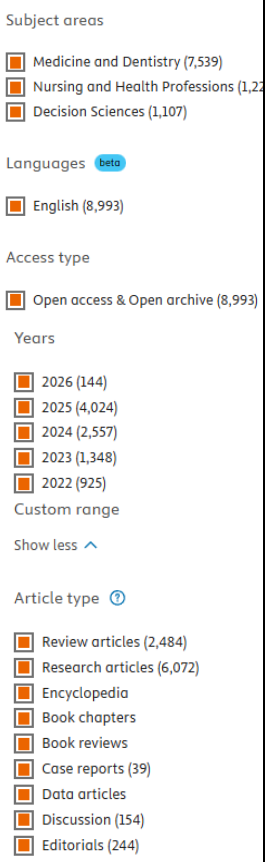
Exclusionary & Inclusionary factors

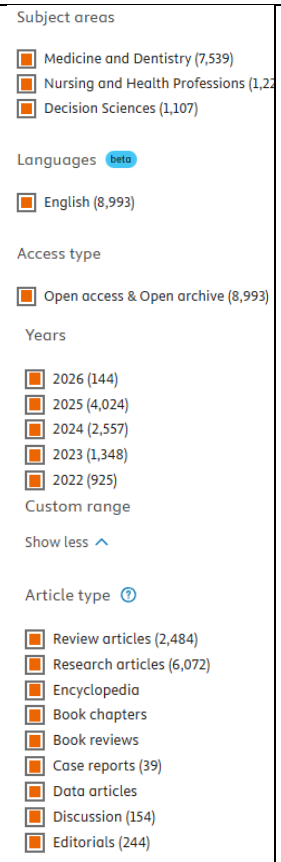
	Included	Excluded
Article Type	- Academic - Peer reviewed (within the last 4-5 years) - Academic/accredited opinion pieces/blogs - International Organisations - Academic grey literature - Research studies - Directly addressing research question/topic of AI ethics for REC in LMIC settings	- Peer reviewed (before 2020) - Non-academic/ accredited opinion pieces/blogs - Not addressing research question/topic of AI ethics for REC in LMIC settings
Methodology	Qualitative & Quantitative studies	
Geographic Scope	Developing countries	Developed countries
Time Frame	After 2020	Before 2020

Search Strategy

Date of Search	Database used	Search Term	Total # articles	Articles included in review of paper
October 12, 2025	Macodrum Library (articles)	("Artificial Intelligence" OR "Machine Learning" OR artificial intelligence) AND ("Ethics" OR ethics OR "Governance" OR oversight) AND ("Health Policy" OR "Public Health" OR healthcare) AND ("Developing Countries" OR LMIC* OR "low- and middle-income countr*" OR Africa OR "Latin America" OR "South Asia")	Artificial intelligence for good health: a scoping review of the ethics literature Artificial intelligence and the future of global health Democratising Artificial Intelligence for Pandemic Preparedness and Global Governance in Latin American and Caribbean Countries	Artificial intelligence and the future of global health
October 18, 2025	Macodrum Library (articles)	("Artificial Intelligence" OR "Machine Learning" OR artificial intelligence) AND ("Ethics" OR ethics OR "Governance" OR oversight) AND ("Health Policy" OR "Public Health" OR healthcare) AND ("Developing Countries" OR	HRM, Artificial Intelligence and the Future of Work : Insights from the Global South The Routledge Handbook of Artificial Intelligence	Artificial intelligence for good health: a scoping review of the ethics literature Research ethics and artificial intelligence

		LMIC* OR "low- and middle-income countr*" OR Africa OR "Latin America" OR "South Asia")	and International Relations Artificial intelligence for good health: a scoping review of the ethics literature Artificial intelligence and the future of global health Research ethics and artificial intelligence for global health: perspectives from the global forum on bioethics in research	for global health: perspectives from the global forum on bioethics in research HRM, Artificial Intelligence and the Future of Work : Insights from the Global South
October 21, 2025	Bioethics today	AI (latest)	https://bioethicstoday.org/blog/building-consensus-for-responsible-ai-in-healthcare/ https://bioethicstoday.org/blog/reimagining-human-rights-for-the-biotechnology-age/ https://bioethicstoday.org/blog/the-importance-of-understanding-language-in-large-language-models/	https://bioethicstoday.org/blog/the-importance-of-understanding-language-in-large-language-models/
October 28, 2025	BMJ Medical Ethics Blog	Tope categories > Artificial Intelligence	https://blogs.bmj.com/medical-ethics/2024/09/19/could-xai-harm-patients-in-time-sensitive-environments/ https://blogs.bmj.com/medical-ethics/2024/03/04/musings-on-artificial-intelligence-fairness-and-conceptions-of-justice-to-help-with-implementation-considerations/ https://blogs.bmj.com/me	https://blogs.bmj.com/medical-ethics/2024/09/19/could-xai-harm-patients-in-time-sensitive-environments/ https://blogs.bmj.com/medical-ethics/2024/03/04/musings-on-artificial-intelligence-fairness-and-conceptions-of-justice-to-help-with-implementation-considerations/

			dical-ethics/2023/11/13/from-bytes-to-bedside-exploring-ai-in-medical-ethics/ https://blogs.bmj.com/medical-ethics/2025/05/19/efficiency-and-education-finding-harmony-in-ai-driven-medical-notes/	
October 28, 2025	AI4PEP	Resources > Research > Publications	https://www.mdpi.com/2227-9032/11/4/457 https://link.springer.com/article/10.1186/s12911-023-02098-3	https://www.mdpi.com/2227-9032/11/4/457 https://link.springer.com/article/10.1186/s12911-023-02098-3
October 30, 2025	ScienceDirect	artificial intelligence in healthcare 	https://www.sciencedirect.com/science/article/pii/S2213398425002908 https://www.sciencedirect.com/science/article/pii/S1386505625003570 https://www.sciencedirect.com/science/article/pii/S1471595325002999	https://www.sciencedirect.com/science/article/pii/S2213398425002908 https://www.sciencedirect.com/science/article/pii/S1386505625003570 https://www.sciencedirect.com/science/article/pii/S1471595325002999
November 1, 2025	ScienceDirect	artificial intelligence in healthcare	https://www.sciencedirect.com/science/article/pii/S2949856225000455	

			https://www.sciencedirect.com/science/article/pii/S2667096824000831 https://www.sciencedirect.com/org/science/article/pii/S187494452400090X https://www.sciencedirect.com/science/article/pii/S2212426824000599 https://www.sciencedirect.com/science/article/pii/S1078143923004179 https://www.sciencedirect.com/science/article/pii/S2514664524015522	
November 3, 2025	World Health Organization (WHO) EU	ethics and governance of AI, big data and AI in health, and LMMs guidance.	https://www.who.int/publications/i/item/9789240084759 https://www.who.int/news/item/18-01-2024-who-releases-ai-ethics-and-governance-guidance-for-large-multi-modal-models https://health.ec.europa.eu/ehealth-digital-health-and-care/artificial-intelligence-healthcare_en https://pmc.ncbi.nlm.nih.gov/articles/PMC11426405/	https://www.who.int/publications/i/item/9789240084759 https://www.who.int/news/item/18-01-2024-who-releases-ai-ethics-and-governance-guidance-for-large-multi-modal-models https://health.ec.europa.eu/ehealth-digital-health-and-care/artificial-intelligence-healthcare_en https://pmc.ncbi.nlm.nih.gov/articles/PMC11426405/
November 7-9, 2025	Pubmed	("low- and middle-income countr*"[tiab] OR LMIC*[tiab] OR "developing countr*"[tiab]	https://pubmed.ncbi.nlm.nih.gov/40241963/	https://pubmed.ncbi.nlm.nih.gov/36530888/

		OR "Global South"[tiab] OR "low-income countr*"[tiab] OR "middle-income countr*"[tiab] OR "resource-constrained"[tiab] OR "resource-limited"[tiab] OR "low-resource setting*"[tiab]) AND ("artificial intelligence"[tiab] OR "machine learning"[tiab] OR "digital health"[tiab] OR eHealth[tiab] OR mHealth[tiab] OR "algorithm*"[tiab] OR "clinical decision support"[tiab] OR "decision support system*"[tiab] OR "predictive model*"[tiab] OR "automated decision*"[tiab]) AND (health*[tiab] OR healthcare[tiab] OR "health care"[tiab] OR "health system*"[tiab] OR "health sector"[tiab] OR "public health"[tiab] OR "primary care"[tiab] OR hospital*[tiab] OR "health policy"[tiab] OR "health information system*"[tiab] OR "electronic health record*"[tiab] OR "health data"[tiab]) AND (ethic*[tiab] OR "ethical oversight"[tiab] OR "ethics committee*"[tiab] OR "research ethics committee*"[tiab] OR "institutional review board*"[tiab] OR IRB*[tiab] OR governance[tiab] OR "AI governance"[tiab] OR "health system governance"[tiab] OR regulation[tiab] OR "regulatory framework"[tiab] OR "legal framework"[tiab] OR "policy framework"[tiab] OR accountability[tiab] OR "duty of care"[tiab] OR stewardship[tiab] OR "responsible AI"[tiab] OR "trustworthy AI"[tiab] OR "risk governance"[tiab] OR "risk management"[tiab] OR "safety monitoring"[tiab] OR "post-deployment monitoring"[tiab] OR "lifecycle governance"[tiab] OR "oversight mechanism*"[tiab]) AND (equity[tiab] OR "health equity"[tiab] OR "health inequalities"[tiab] OR fairness[tiab] OR "algorithmic bias"[tiab] OR "algorithmic fairness"[tiab]	https://pubmed.ncbi.nlm.nih.gov/37340738/ https://pubmed.ncbi.nlm.nih.gov/39133537/ https://pubmed.ncbi.nlm.nih.gov/36530888/ https://pubmed.ncbi.nlm.nih.gov/34567966/ https://pubmed.ncbi.nlm.nih.gov/39566062/ https://pubmed.ncbi.nlm.nih.gov/41007526/ https://pubmed.ncbi.nlm.nih.gov/41080349/ https://pubmed.ncbi.nlm.nih.gov/40978155/ https://pubmed.ncbi.nlm.nih.gov/37018013/ https://pubmed.ncbi.nlm.nih.gov/39012688/ https://pubmed.ncbi.nlm.nih.gov/40605996/ https://pubmed.ncbi.nlm.nih.gov/41228128/ https://pubmed.ncbi.nlm.nih.gov/40697670/ https://pubmed.ncbi.nlm.nih.gov/41150886/ https://pubmed.ncbi.nlm.nih.gov/40248038/	https://pubmed.ncbi.nlm.nih.gov/37340738/ https://pubmed.ncbi.nlm.nih.gov/34567966/ https://pubmed.ncbi.nlm.nih.gov/41007526/ https://pubmed.ncbi.nlm.nih.gov/41080349/ https://pubmed.ncbi.nlm.nih.gov/37018013/ https://pubmed.ncbi.nlm.nih.gov/39012688/ https://pubmed.ncbi.nlm.nih.gov/40605996/ https://pubmed.ncbi.nlm.nih.gov/40697670/

		OR "social justice"[tiab] OR "data justice"[tiab] OR "epistemic justice"[tiab] OR "epistemic injustice"[tiab] OR inclusion[tiab] OR inclusive[tiab] OR "decolonizing"[tiab] OR "decolonising"[tiab] OR "contextual relevance"[tiab] OR "context-specific"[tiab] OR "local knowledge"[tiab] OR indigenous[tiab] OR "indigenous knowledge"[tiab] OR marginalized[tiab] OR marginalised[tiab] OR "vulnerable population*"[tiab]) AND ("institutional capacity"[tiab] OR "capacity building"[tiab] OR "governance capacity"[tiab] OR "regulatory capacity"[tiab] OR "institutional strengthening"[tiab] OR "health system strengthening"[tiab] OR "fit-for-purpose"[tiab] OR "fit for purpose"[tiab] OR "implementation science"[tiab] OR implementation[tiab] OR "policy implementation"[tiab] OR "programme implementation"[tiab])		

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