Artificial Intelligence in Healthcare: Considerations and Implications for the Indian Health Service and Tribal Health Authorities

Amit Suneja, MD, MPH

Agenda

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About me

Objectives

- Recognize and be able to articulate the varied uses of AI in clinical and non-clinical healthcare settings

- Understand the limitations and challenges associated with use of AI in clinical and non-clinical healthcare settings, with a focus on Indigenous communities

- Identify at least one AI tool for potential immediate use in your setting to improve workflow efficiency

- Prepare and plan for increased utilization of AI tools in your setting

- Identify and analyze potential challenges and opportunities in implementing AI-driven healthcare solutions within Indigenous communities, including strategies for ensuring equitable access and respectful integration of traditional practices

Overview of AI in Healthcare

- Definition and key components of AI - Machine Learning, Natural Language Processing, Robotics
- Relevance and importance in modern healthcare, both clinical and non-clinical
    - Administrative workflow, processes, and outputs
    - Diagnostics
    - Predictive Analytics and Population Health
    - Direct Service Provision
        - Scheduling
        - Chatbots
        - Patient education
        - Treatment planning

Foundational considerations for Indigenous communities

AI: a new (r)evolution or the new colonizer for Indigenous peoples?

Dr. Hēmi Whaanga

This is an essay by linguist and te reo Māori specialist Dr. Hēmi Whaanga (Ngāti Kahungunu, Ngāi Tahu, Ngāti Mamoe, Waitaha). Dr. Whaanga warns of the potential for AI and related technologies to be used against Indigenous peoples as an extension of colonial practices of exploitation, extraction and control, particularly those that displace a peoples' understanding of themselves with a worldview that favors the colonizer. He discusses issues of data sovereignty in a technological landscape populated by AI systems existentially dependent on sucking up vast amounts of data on human activity, thereby putting Indigenous traditional knowledge and customary practices at risk of global-scale appropriation. Dr. Whaanga finishes his essay with a call to centralize Indigenous concerns in the work of establishing global ethical guidelines for the design and deployment of AI.

Foundational considerations for Indigenous communities

- AI is only as good as the data being used to create it
- The sources, frameworks, and worldview that AI is built on are Eurocentric, colonial, and often exclude Indigenous perspectives
- Creators of AI tools and applications are often not thinking specifically about the needs of Indigenous communities
- Some resources do exist for incorporating Indigenous perspectives into the design and deployment of AI
  - Position paper on Indigenous Protocol and Artificial Intelligence https://www.indigenous-ai.net/position-paper/
  - Why First Languages AI Can Be a Reality: https://www.youtube.com/watch?v=Omp3X-FXdLs

AI solutions to challenges in healthcare for Indigenous populations
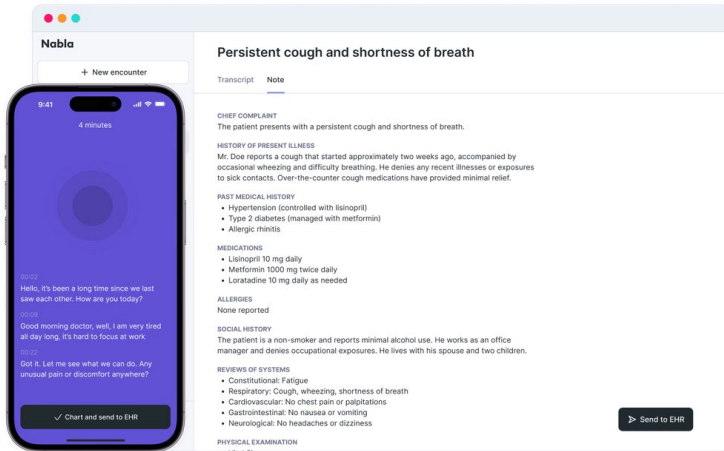
01 Limited access to care
- AI-driven telemedicine and remote consultations

02 Shortage of healthcare providers
- Virtual health assistants to assist with triage, offering advice, and reducing burden on other providers

03 Limited access to specialist care
- AI-powered diagnostic tools

04 Need for culturally sensitive care
- Train AI directly using culturally specific data

What AI does **not** do

- Create, implement, monitor, and evaluate complex systems
- Proactively and iteratively problem-solve in interdisciplinary team-based environments
- Incorporate social, economic, political, and historical context
  - AI lacks true understanding of context, culture, or human emotions. It processes information based on patterns rather than comprehension.
- AI systems are not aware of all of their flaws
  - AI hallucinations: false or nonsensical information. These outputs may sound convincing but lack accuracy or truth.
  - Bias in algorithms: incorrect information or assumptions

Applications in day-to-day clinical medicine

- Visit transcription and note generation
- Letter-writing for patients
- Virtual health assistants

AI powered diagnostics: detection of diabetic retinopathy

How the AI Model Works (1/4)
Over 50 ophthalmologists have manually reviewed more than 1 million anonymous retina scans, rating each for the level of diabetic retinopathy present.

How the AI Model Works (2/4)
Each scan is reviewed multiple times, and is graded manually on a scale of 1 (no diabetic retinopathy signs present) to 5 (extreme signs present).

How the AI Model Works (3/4)
The graded images are then fed into an image recognition algorithm. By feeding the algorithm thousands of graded images, it can start to understand signs of diabetic retinopathy just like an ophthalmologist would.

How the AI Model Works (4/4)
Once the algorithm has been trained, it can be used to power an application called an Automated Retinal Disease Assessment (ARDA). ARDA allows a user to upload a retina scan for instant analysis of diabetic retinopathy.

Diabetic Retinopathy Grade 01

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Predictive Analytics

- Individual surveillance
- Public health surveillance
  - Predicting outbreaks
  - Monitoring health trends
- Reminiscent of predictive crime analytics and the issues that have plagued these technologies

JvionAI

Prescriptive Intelligence that Helps You
Intercept & Course-Correct

Jvion goes beyond traditional predictive analytics, identifying hidden patient risk across various diseases and clinical events and if that risk trajectory can be changed towards a positive outcome. Our prescriptive AI then recommends appropriate action for each patient – taking into account clinical, socioeconomic and behavioral data — in addition to clinically-validated best practices. Armed with this intelligence, healthcare organizations can improve quality, cost, and the overall patient experience.

Identify
At-Risk Patients

Analyze clinical, socioeconomic, environmental and behavioral data to find hidden health and financial risks

Assess
Modifiable Patients

Evaluate modifiable patients and their unique attributes to drive action plans

Intervene
Change the Outcome

Provide evidence-based, prioritized, and patient-specific recommendations within existing workflows

AI in mental health support: Wysa

Step 1 : Opening up to an AI coach

- Conversational AI creates an anonymous, safe space to work through worries and stressors, preventing them from escalating in severity and towards illness
- Wysa's AI is clinically proven to create a therapeutic alliance equivalent to a human therapist within the first week
- Most people feel better after their first conversation and lean on Wysa for on-demand support, whenever needed
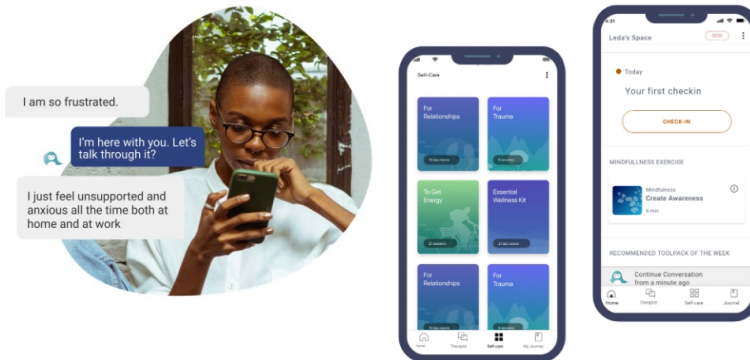

Step 2: Structured programs and on-demand self-care

- Wysa's AI conversational care guides users through both curated CBT programs and on-demand support
- In Wysa's Clinical Programs, the AI checks in every morning and evening, and can also be supplemented by a human coach or therapist. The programs are clinically validated to reduce symptoms of depression and anxiety
- For day-to-day stress, Wysa offers on-demand self-care through 150+ evidence-based exercises, including resources for anxiety, sleep, handling difficult conversations, and improving productivity.

Step 3: Work with a professional

- Wysa coaches offer 1-on-1 sessions, along with unlimited messaging between sessions. If chosen, employees can also be redirected to in-house EAP support through Wysa
- Wysa's conversational AI takes on 80% of the load by supporting people with sub-clinical symptom levels and guiding them through proactive prevention routines
- Those who need professional support can access it sooner and as much as needed
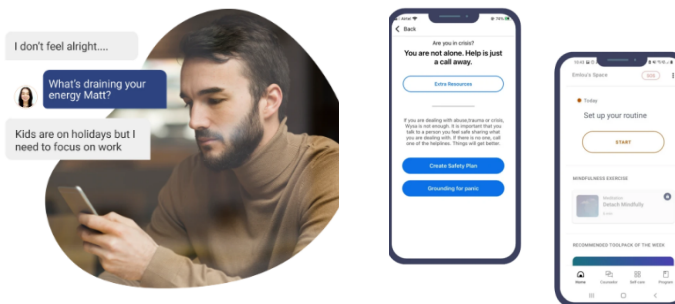

Step 4: Customised escalation pathways

- Wysa's SOS feature guides people toward local and national crisis care helplines
- The SOS feature also offers the ability to create a personal safety plan and practice grounding exercises
- Wysa's AI continuously screens for people in crisis and facilitates signposting to local helplines

General workplace use of AI

ChatGPT demonstration

Ethical considerations and challenges

- Data privacy and security
- Data sovereignty and ownership
- Meeting the specific needs of Indigenous communities
- Importance of diverse data sets, ensuring inclusivity and non-discrimination while eliminating bias
- Impact on and incorporation (or lack thereof) of traditional knowledge
- Equity and access
- Environmental impact
- Autonomy and overreliance on AI
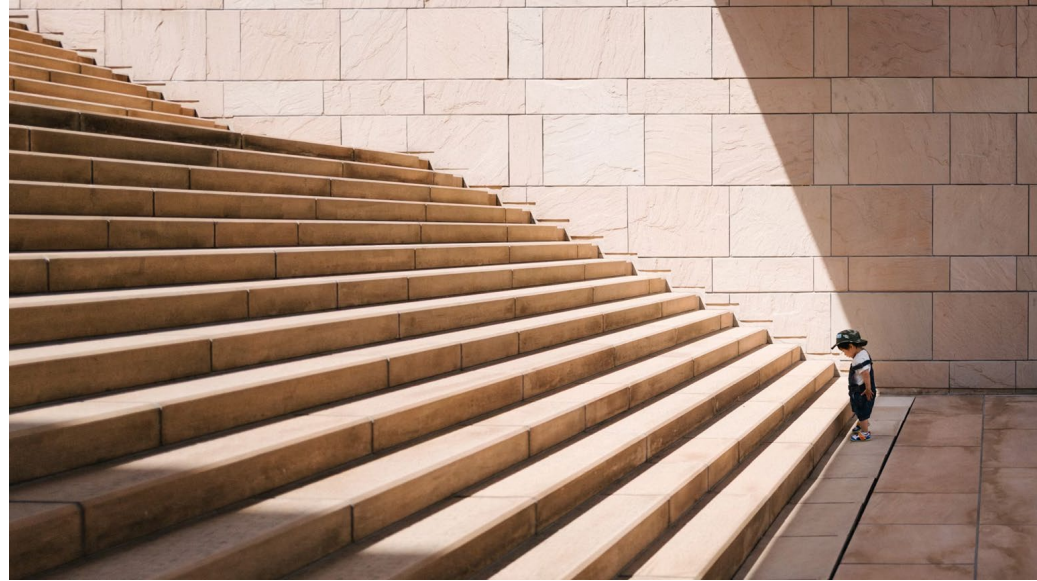
Regulatory and policy landscape

- HIPAA compliance
- Cultural and ethical guidelines
- AI and data sovereignty legislation
- FDA approval for AI-based medical devices
- Informed consent
- Traditional knowledge protection
- Workforce impacts and training
- Liability and accountability
- Environmental considerations
- Intergovernmental collaboration

Conclusion

- AI is here to stay
- Considerations in developing and deploying AI in and for Indigenous communities are complex
- There are applications that various stakeholders within IHS and other Tribal Health Authorities can start using today - but should they?