

# Artificial Intelligence & Systemic Challenges

Andrew Connolly  
March 2019



# DECLARATION

- Former Chair, Medical Council of New Zealand
- Current Member, Governance Group overseeing re-build of a complete N.Z. public hospital, includes decision regarding IT
- Member various AMC Accreditation teams for review of specialist colleges
- Views represented in this presentation are personal



# OVERVIEW OF ISSUES FOR HEALTH SYSTEMS

- No doubt the AI is developing very rapidly
- AI offers enormous potential
- Regulation is lagging behind innovation
  - Including Legislation, Standards, Accreditation, Training and Accountability
- Ethical framework similarly in need of urgent attention
- Safety is not guaranteed as extent of the power of AI is not known
- AI is not a panacea to ever challenge
  - Even the basics not fully addressed in some jurisdictions:
    - How is the Health Record maintained and accessed?
    - Can data entry be a matter of choice?
    - Inter-connectivity of the IT systems



# WHAT IS IT, WHAT ISN'T IT...?

- It is artificial but is it intelligent?
  - It is powerful information but the key is the use of that information
  - Ability to acquire & provide relevant data in real time
  - Ability to predict various outcomes, suggest various diagnoses
  - Ability to deliver treatments
  - But:
    - Empathetic?
    - Compassionate?
    - Culturally competent?
  - How do we train for it and with it?
  - Is it always right?
    - If not, how is it better than a clinician alone?
    - How much better can it make decision-making?



## ROLE OF AI WILL VARY

- Pattern recognition offers tremendous advantages
  - Multiple studies show improvement over some human tasks
    - Skin cancer diagnosis, radiology findings, ophthalmology, cardiology etc.
- Determination of a person's destiny is far less clear
- Obvious value in answering questions relevant to a patient's choice
  - AI should strengthen Informed Choice by ability to rapidly produce data of relevance
- Delivery of treatments
  - Robotics
  - Infusions
  - Radiation



## AS THE 21<sup>ST</sup> CENTURY PROGRESSES...

- AI competent doctors will surpass AI-naïve ones
- Funders will seek further IT solutions
  - Machines do not need employment contracts
- Regulation will be critically important
- Jurisdictions are grappling with these issues now
  - Legislative
  - Regulatory
  - College
- Opportunities to empower alternative workforces with safety netting



# DATA DRIVEN CARE

- Should be great, but not if to the exclusion of logic and appropriate discretion
- Should inform decisions by clinicians and patients
- Should aid Recertification / Revalidation
- Can exclude or include likely diagnoses, but risks exist
  - Risk of over as well as under investigation
  - Ameliorated broadly by approaching AI as a partner in a clinical pathway
  - The learning pathways of the algorithms are critically important
    - But how many understand these algorithms?
- Should improve outcomes
  - If not, why use it?



## SYSTEMIC ISSUES INCLUDE:

- Trust
- Patients & communities
- Regulatory frameworks
- Clinicians
- Education and Training
- Legislative



# TRUST

- Public have high levels of trust in clinicians and health regulators
- Trust in Technology may be different
  - Declining numbers of people in US believe the Internet has aided society
    - 76% in 2014, 70% in 2018 (Pew Research Centre)
    - Decline greatest amongst those over 65 years (decrease of 14%)
- Public seek common factors from their clinician



# WHAT PATIENTS WANT

- Transparency
- Active listening
- Trust
- Care & connection
- Respect
- Time
- Effective Communication
- Empathy
- Access
- Clear Communication
- Collaboration

65% of those surveyed want to use smart phone technology to access services

PwC Health Research Data



## ISSUES FOR THE PUBLIC

- Desire to be treated as a partner in decision making
  - Huge opportunity to answer relevant questions
    - Benefits/risk of a proposed treatment or decision
- Relevance to the unique setting
- Language barriers
  - What if a help line is run purely by AI?



## ISSUES FOR THE REGULATORS / ADMINISTRATORS

- How is the technology governed including establishing its suitability for the role?
- How is it maintained?
  - Should the IT be regulated as a therapeutic device?
  - Who approves the system that is chosen?
    - Budget holders or Regulators?
  - What does Recertification in the presence of AI look like?
  - How do we upgrade the computer system's knowledge?
  - How is data entry handled?
  - Does the IT reflect local / regional / national realities?
- Does AI risk worsening inequities?



# ISSUES FOR CLINICIANS

- Integration of AI into practice
- Autonomy / over-ride if the clinician disagrees with the computer
- How is Audit conducted?
- Where is the error and what is the risk?
  - Is it in the data, the programme, or with the professional?
- Accountability
- Reliability of the AI system
  - Updating
  - Relevance to local practice



## RISK OF DEVALUING HUMANITY?

- Internet is a source of tremendous good and terrible evil
- No system can be guaranteed predator free
- Recent concern over computer telling a patient they were dying of cancer
- Outcomes are often not guaranteed
  - Acute vs. elective or long-term
- Interference to clinical autonomy
  - Legislation to only allow certain options?



# ISSUES FOR WORKFORCE PLANNING

- Does AI offer increased scope to those not trained to be doctors?
  - Definitely allows for clinical pathways and decision-making in defined areas
  - It should free clinician time
- How will training providers be Accredited?
  - Will this vary depending on the knowledge source?
- How will education and assessment need to be adjusted?
  - Relevant to undergraduates and post-graduates
- Easier to see solutions when AI used in partnership with clinicians as opposed to being a substitute for clinicians



POSSIBLE SOLUTIONS TO THESE ISSUES



# TRAINING

- We must expose students / trainees to technology especially its application as an aid to decision making / informed choice
- Eminently suited to in-training assessment
  - It's another version of a multidisciplinary approach
- Needs to be considered in Accreditation Standards
  - Access / exposure
  - Facilities
  - Audit / accountability
- Therapeutic use will need specific credentialing processes
  - Not every surgeon should expect to use a Robot



# ACCOUNTABILITY OF CLINICIANS IN THE AI WORLD

Where AI is an adjunct to clinical skills & decision making:

- Two fundamental questions:
  - Was it reasonable to utilize AI for part of the clinical pathway?
  - Based on the information gleaned from AI, was decision-making clinically and professionally acceptable?



## THE INTERNET KNOWS FEW BOUNDARIES: WAYS FORWARD:

- Establish Regulation for each aspect
- Establish accountability for each step
  - Mantra: *clinicians and patients being informed, but not governed by AI*
- Prescribing can be handled by restrictions on ability to import, distribute & dispense medications
- Operations can handled by Regulation of the facility
- IT itself can be handled by Licensing & contractual processes
- Defined and mandatory audit of key outcomes



## FULLY AUTOMATED PROCESSES

- Some will be safe now:
  - Pattern recognition with acceptable sensitivity and specificity
- Accountability and responsibility will need to rest predominantly with the developers and those who maintain the AI as well as with those who introduce it
  - In NZ this could be covered by Health & Safety legislation
- Will likely need international agreements and cooperation given cloud technology and residence of the developers
- Need robust processes around evaluation and introduction of technology
- Robots doing operations as instructed by computers?
  - Fool for a patient and a surgeon.....



# LEGISLATION

- Whole issue of trans-national health care is fraught with risks and gaps
- Jurisdictions lack authority outside territorial boundaries
- Governments will need to address this
  - Doctors – maybe handled best via contract law
  - Machines – agreements on standards, ownership of information, access and use of data



## SUMMARY

- It's here and it's not going away
- It offers tremendous advantages if used and regulated correctly
- Those who administer and regulate health systems need to front foot the issues
- International cooperation including at governmental level is necessary
- Keep patient needs at forefront of debate
- Training and education are easily adapted to a cooperative model of utilizing AI
- Accountability is achievable in a partnership model, but much more challenging in a substitution model