Enhancing global access to imaging

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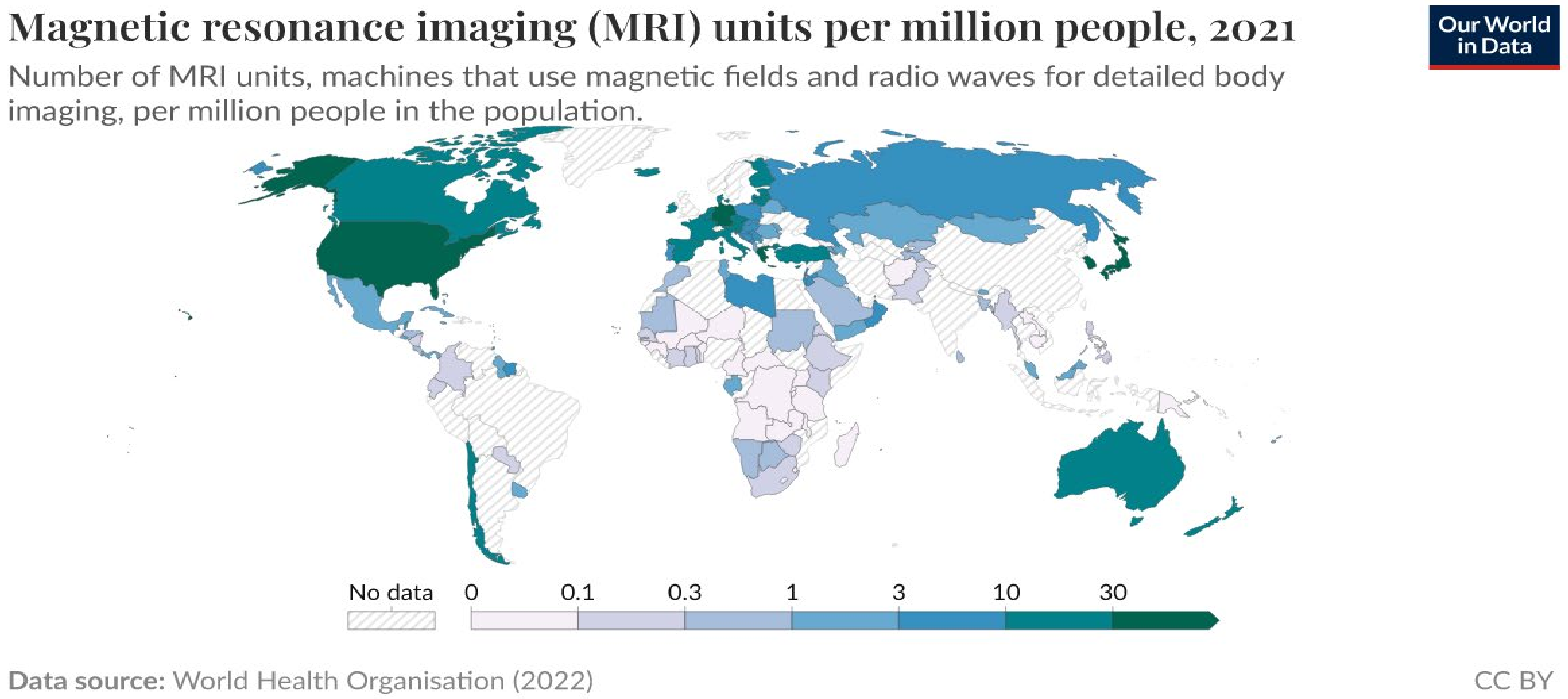
How uneven is the distribution of MI?



Main factors impacting availability

- **Physical and Digital Infrastructure, Logistics**
  - Equipment availability, Supply chains, Power supply, Connectivity (broadband access), Cloud & data storage
- **Human Resources & Training**
  - Radiologists and technicians, AI and decision support, Maintenance personnel
- **Policy, Financing & Partnerships**
  - Financing models, Public–private partnerships, Integration into universal health coverage

Innovation & Emerging Solutions

- **Low-cost imaging technologies**: Portable ultrasound, AI-enabled X-ray readers, and simplified MRI designs.

- **Tele-imaging networks**: Cloud-based platforms where radiologists in well-resourced regions support those in underserved areas.

- **AI-driven solution to bring imaging to underserved areas**: Automated interpretation and decision support, triage,

AI supporting public health and policy

Role of AI: bridging the radiologist gap and scaling beyon urban centers

- **Portable Devices with AI**: Handheld ultrasound combined with AI-guided acquisition and interpretation can bring imaging to rural and low-resource settings.

- **Automated Interpretation and teleradiology**: AI can assist in reading chest X-rays (e.g., TB, pneumonia, COVID-19), mammograms, or CT scans when radiologists are scarce. Cloud-based AI solutions can pre-analyze scans and assist radiologists working remotely

- **Triage & Prioritization**: AI can flag urgent cases (e.g., stroke on CT, pneumothorax on X-ray) to ensure faster treatment.

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Advancing TB detection in Nigeria: AI-enabled solutions at the forefront

Tuberculosis (TB) remains a significant public health challenge in Nigeria, which ranks **sixth among high TB burden countries and first in Africa for TB, MDR-TB, and TB/HIV cases**. With an estimated **499,000 TB cases in 2023** but only **74% of them detected**, a substantial gap persists in case identification and treatment. Addressing this challenge requires **innovative screening solutions,** including AI-powered X-ray systems, which have played a transformative role in strengthening Nigeria's TB detection efforts.

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Development and clinical validation of Swaasa AI platform for screening and prioritization of pulmonary TB

Gayatri Devi Yellapu, Gowrisree Rudraraju, Narayana Rao Sripada, Baswaraj Mamidgi, Charan Jalukuru, Priyanka Firmal, Venkat Yechuri, Sowmya Varanasi, Venkata Sudhakar Peddireddi, Devi Madhavi Bhimarasetty, Sidharth Kanisetti, Niranjan Joshi, Prasant Mohapatra & Kiran Pamarthi

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While ultrasound services are normal practice in many countries, software being tested in Uganda will allow a scan without the need for specialists, providing an incentive for pregnant women to visit health services early on

The software has been trained on a database of millions of images to 'recognise' a pregnancy's gestation. Photograph: Intelligent Ultrasound

Role of AI: Supporting Public Health and Policy

- **Population Screening**: AI can support large-scale screening programs (e.g., TB, breast cancer, lung disease) in low-resource regions.
- **Data for Health Systems**: AI analytics can identify trends in disease burden, supporting resource planning and public health interventions.
- **Global Health Emergencies**: During pandemics or disasters, AI-enabled imaging can accelerate detection & triage in field hospitals.

Also here AI is not a **replacement** for radiologists, but has the potential to be a **force multiplier** that:

- Extends imaging services to underserved areas
- Improves accuracy and consistency of diagnostics
- Enables affordable, scalable, and equitable access

And because the need is larger, adoption of AI may actually be faster

Role of AI: a word of caution

1. Data Limitations

- Mostly trained on data from **high-income countries**, which may not reflect the disease patterns, demographics, or equipment quality in low-resource settings.

2. Infrastructure Gaps

- AI requires **electricity, internet, and storage**. In many places, power/internet unreliable. Without it, AI tools can't even be deployed.

3. Cost and Sustainability

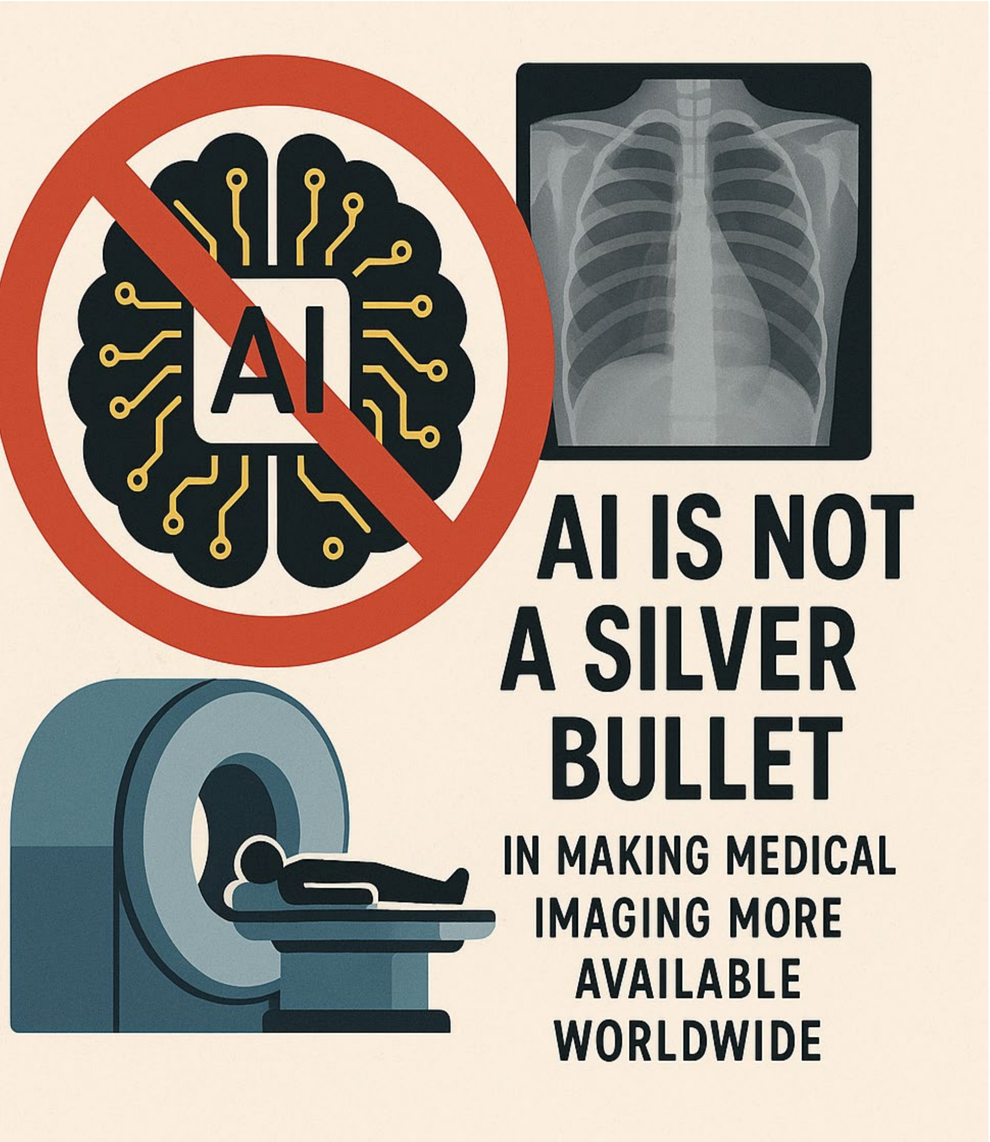
- While AI promises **low-cost**, many solutions are **proprietary/expensive**. Maintenance, updates & support often overlooked, leading to "technology graveyards"

4. Workforce and Trust

- AI cannot (yet ;-)) fully replace human expertise. Clinicians, health workers must be trained to **use AI safely**, interpret its outputs, and know its limits.

5. Regulation & Ethics

- Many countries lack regulatory frameworks for **AI in healthcare**.



But a **powerful enabler**, if combined with:

- Investments in infrastructure (equipment, connectivity, power)
- Workforce training and capacity-building
- Locally adapted and validated AI models
- Sustainable financing models