Digital respiratory medicine in the global health context: the case of TB

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WHO Global TB Programme, Switzerland

"Digital respiratory medicine – realism v futurism"
A digital health summit of the ERS"- Friday 4 June 2021

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Declaration of Interests

The speaker is a staff member of the Global TB Programme of the World Health Organization (WHO)

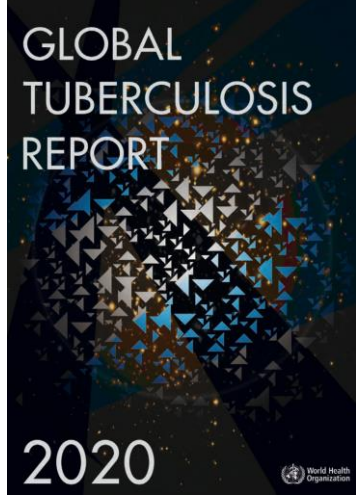
Between 2014 and 2020 the Global TB Programme received funds from the ERS to work on digital technologies and lung health

He has no other interests to declare

The global TB situation

A quarter of the world's population is infected with TB bacilli.

	Estimated incidence, 2019	Estimated number of deaths, 2019
All forms of TB	10.0 million (8.9–11.0 million) 12% children <15y | 56% men | 32% women	1.2 million* (1.1–1.3 million)
HIV-associated TB	815,000 (729,000–906,000)	208,000 (177,000–242,000)
Multidrug- / rifampicin-resistant TB (MDR/RR-TB)	465,000 (400,000–535,000)	182,000 (113,000–250,000)



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* Excluding deaths attributed to HIV/TB

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Digital health : some definitions

eHealth The use of information and communications technology (ICT) in support of health and health-related fields, including health care services, health surveillance, health literature, and health education, knowledge and research.

mHealth The use of mobile and wireless technologies to support health objectives. mHealth is a component of eHealth

Digital health An overarching term that comprises eHealth (which includes mHealth), and emerging areas, such as the use of computing sciences in the fields of artificial intelligence, big data and genomics

Long history ...

VOL. 19, NO. 6. JUNE, 1973.

A simple computerised Tuberculosis register with data collection in the field (suitable for a developing country)

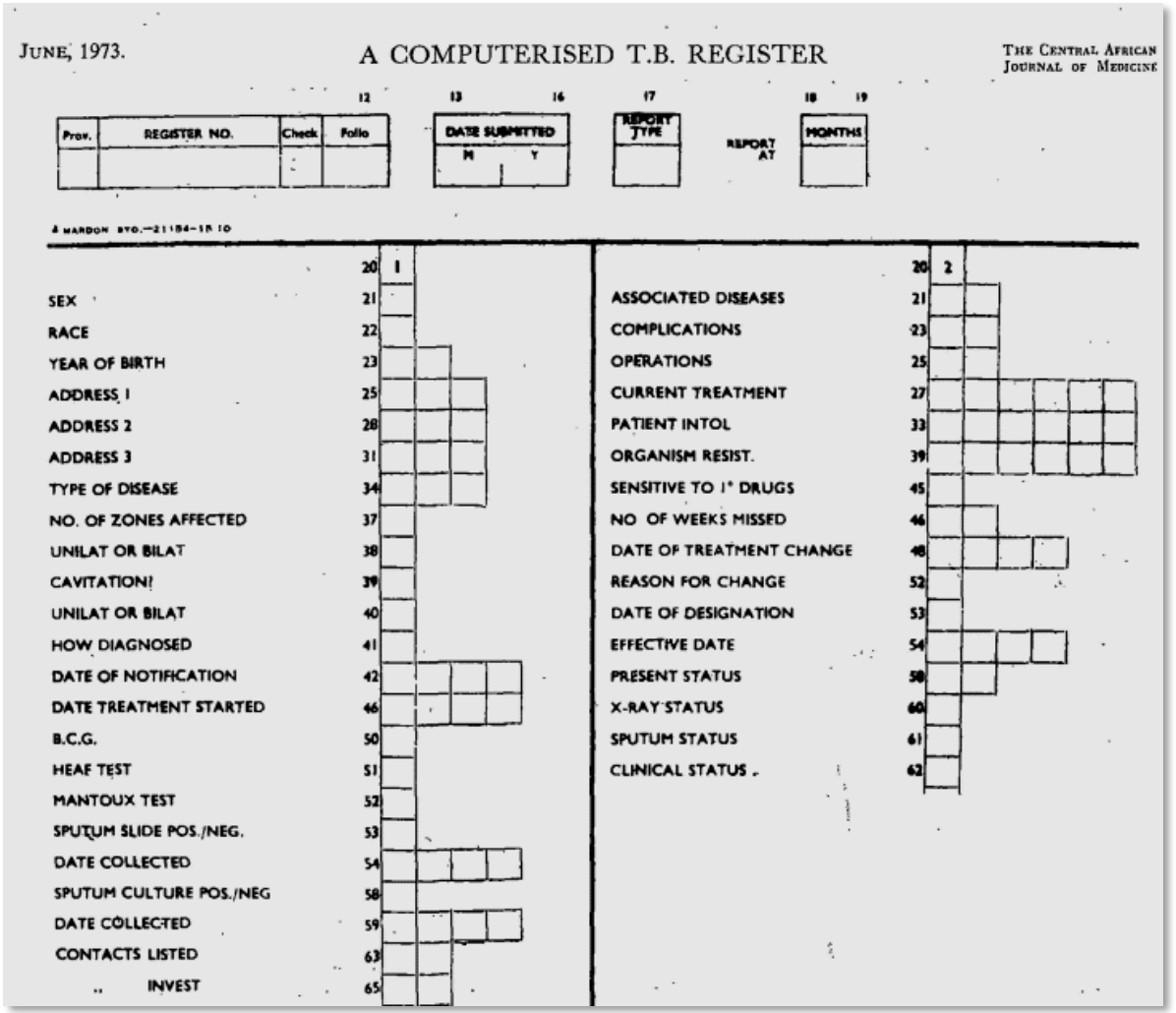
BY

R. W. DOY

Tuberculosis Officer (Matabeleland) Bulawayo.

An earlier communication[1] described the organisation of the tuberculosis service in Matabeleland, and how the simple card index register enables us to keep track of patients and control their treatment. This paper discusses the second major role of a tuberculosis register, that is as a repository of clinical and epidemiological information from which material can be extracted for statistical analysis; and how we have been able to introduce this second function at little extra cost and within our existing slender manpower resources.

There is sufficient tuberculosis in the province for any organised assault upon it to produce a demonstrable effect, and that the inception of



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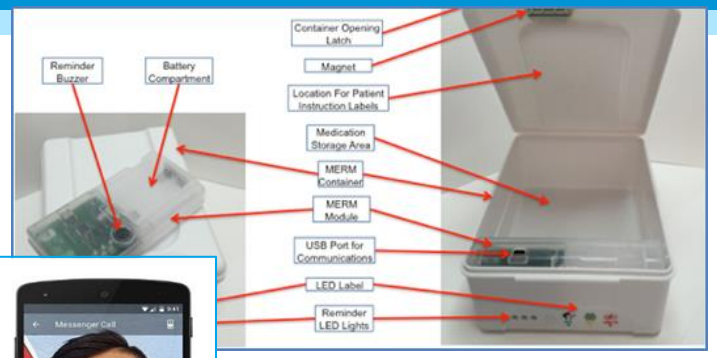
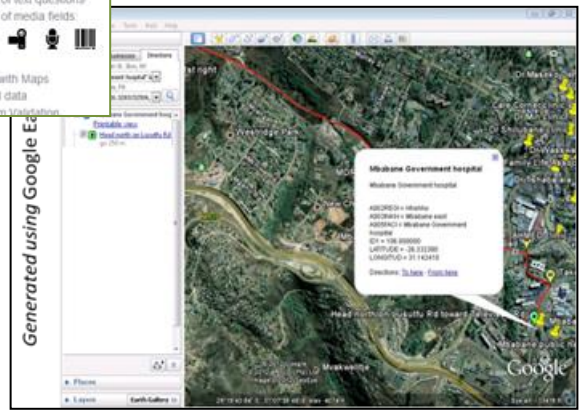
A conceptual framework



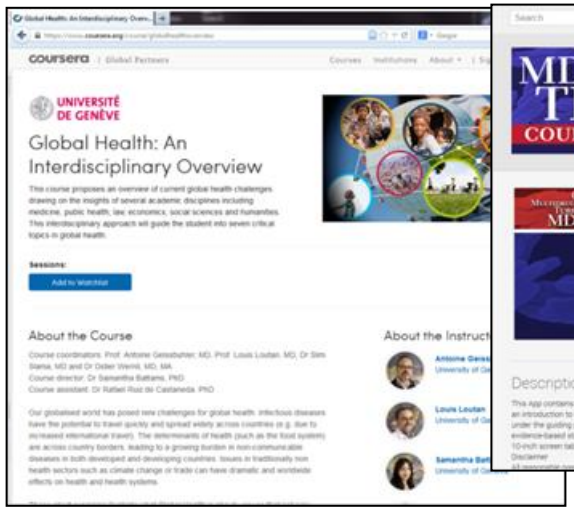
Patient care

Programme management



Surveillance

eLearning



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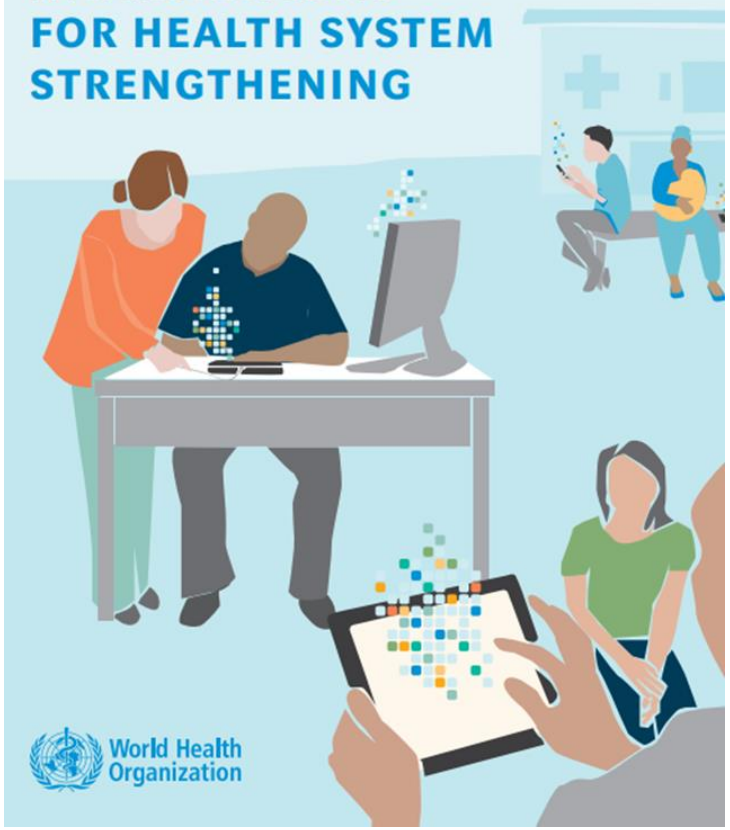
WHO GUIDELINE

RECOMMENDATIONS ON DIGITAL INTERVENTIONS FOR HEALTH SYSTEM STRENGTHENING



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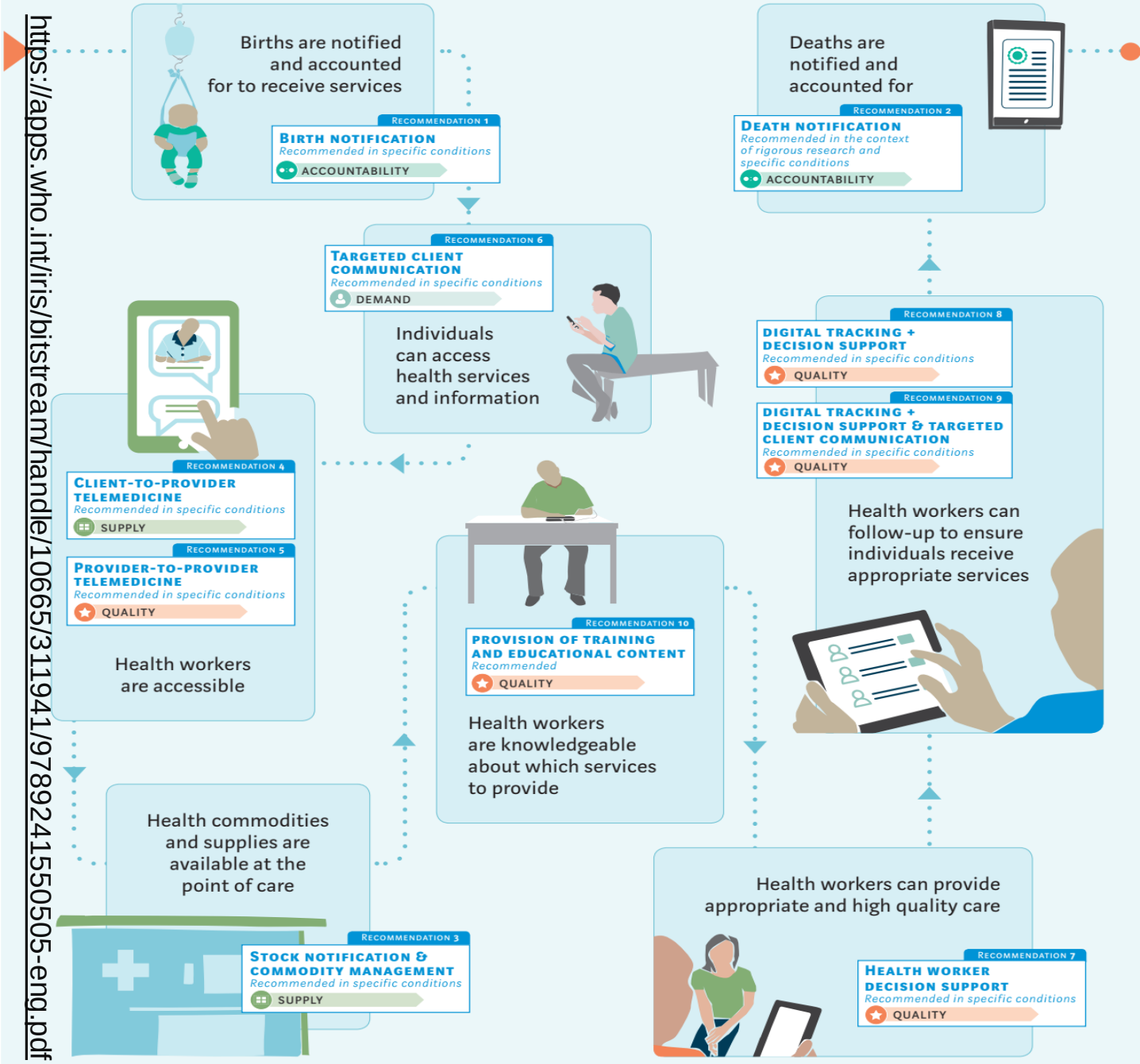
https://apps.who.int/iris/bitstream/handle/10665/311941/9789241550505-eng.pdf

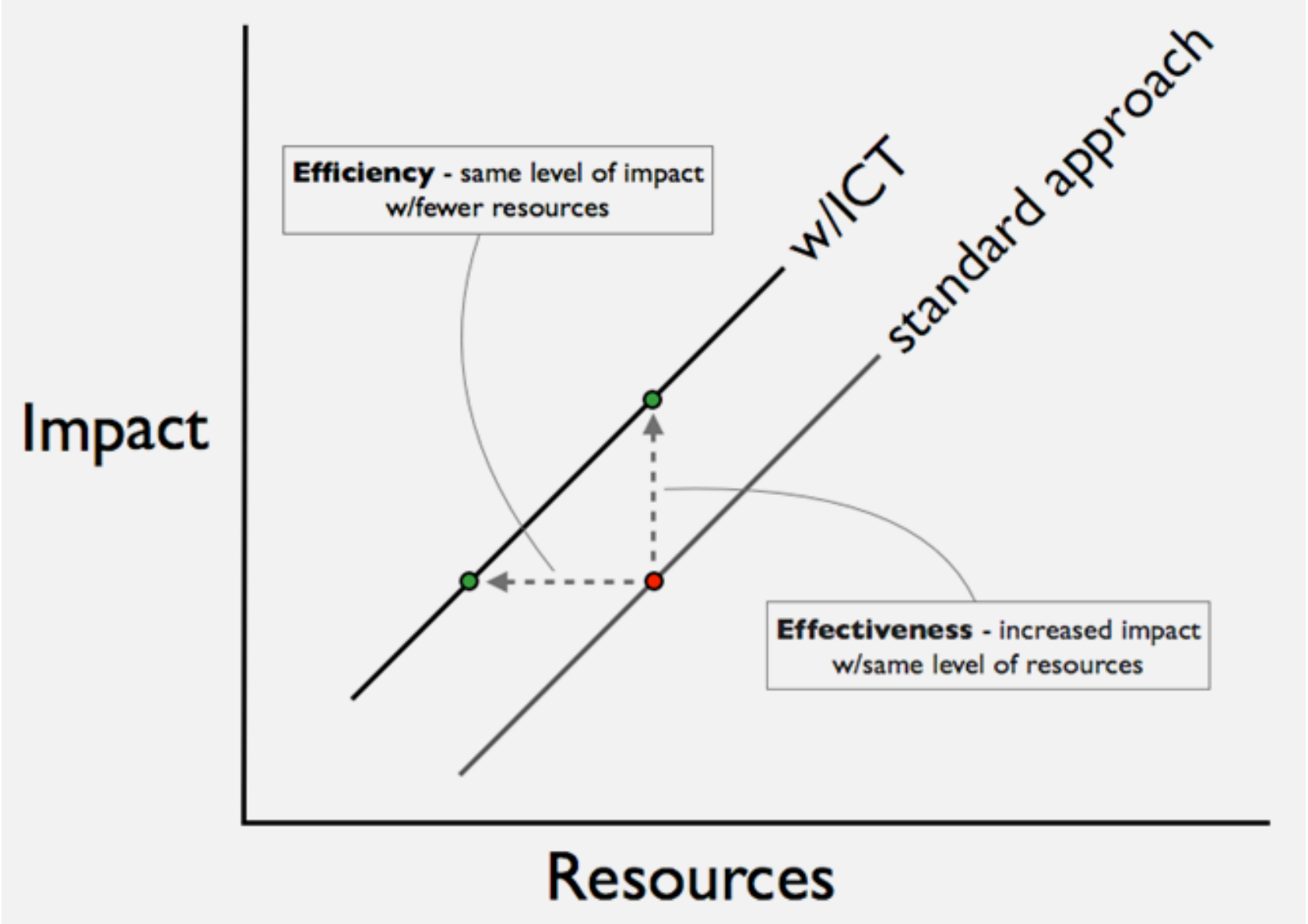
FIGURE 4 LINKAGES OF THE RECOMMENDATIONS ACROSS THE HEALTH SYSTEM



Common premises for digitizing health care

- Communication is critical to behaviour change and healthier choices
- Better data management can inform decisions, improve performance, and lower costs
- Computerization facilitates data transfer
- Increased global access to equipment, software, connectivity can improve health care

"... if your initiative isn't increasing <u>effectiveness</u> or <u>efficiency</u> (or both) then you shouldn't be doing it."



John BONTEMPO
linearityofexpectation.blogspot.ch

GRADE : evidence to decision

considerations when formulating evidence-based recommendations

• Is the problem a priority?
• How substantial are the desirable anticipated effects?
• How substantial are the undesirable anticipated effects?
• What is the overall certainty of the evidence of effects?
• Is there important uncertainty about or variability in how much people value the main outcomes?
• Do the desirable effects outweigh the undesirable effects?
• How large are the resource requirements?
• What is the certainty of the evidence of resource requirements?
• Are the net benefits worth the incremental cost?
• What would be the impact on health equity?
• Is the intervention acceptable to key stakeholders?
• Is the intervention feasible to implement?

Adapted from Moberg J et al. 2018
https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-018-0320-2

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Certainty in the estimates of effect

Certainty	*Definition*
High	Further research is very unlikely to change our confidence in the estimate of effect.
Moderate	Further research is likely to have an important impact on our confidence in the effect and may change the estimate.
Low	Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low	Any estimate of effect is very uncertain.

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Adapted from Guyatt GH et al. BMJ. 2008 Apr 26,336(7650):924-6

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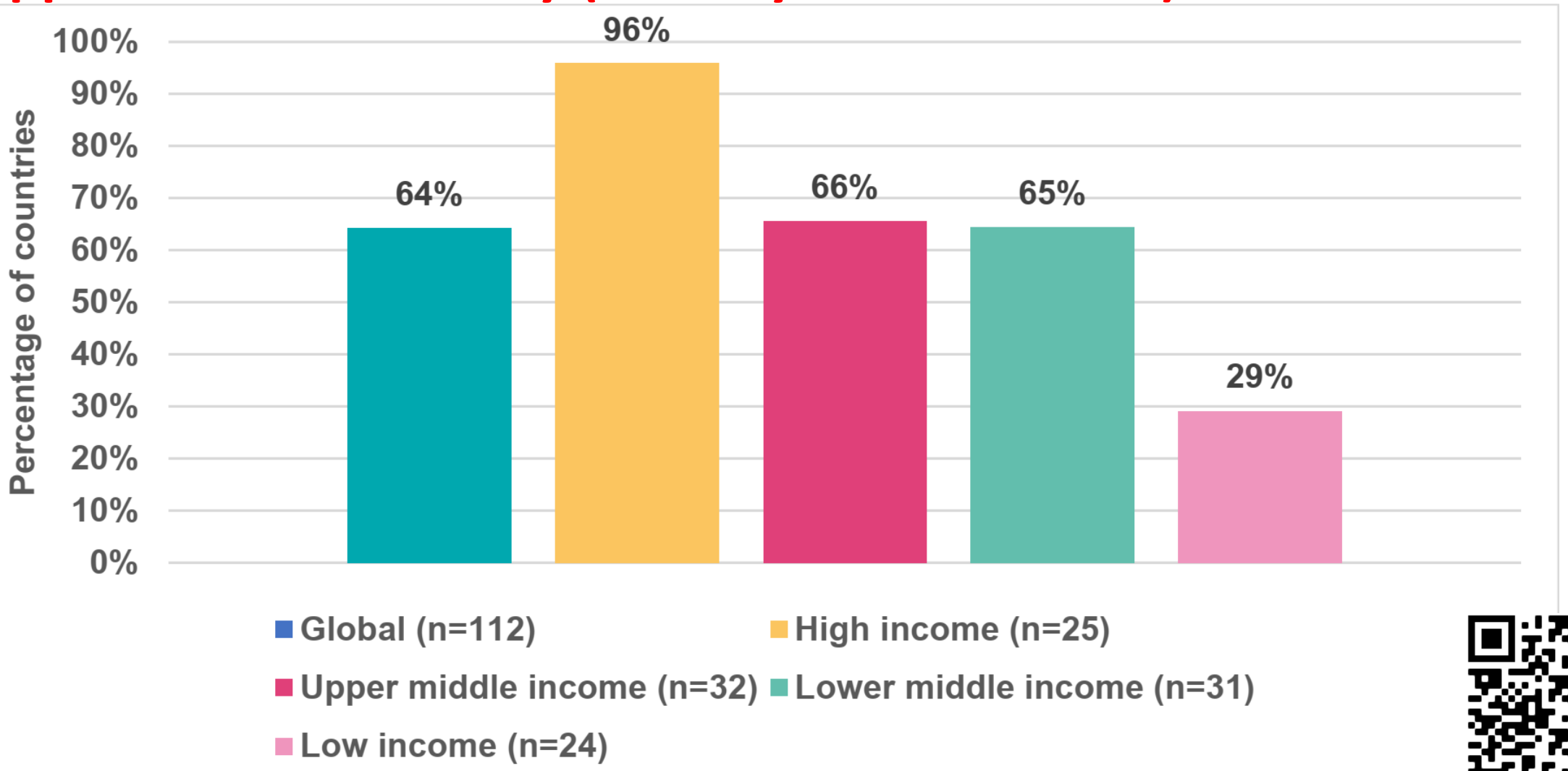
Coronavirus has exposed the digital divide like never before

Fewer than 1 in 10 households in less economically developed countries world are connected. Image: REUTERS/Amanda Perobelli

https://www.weforum.org/agenda/2020/04/coronavirus-covid-19-pandemic-digital-divide-internet-data-broadband-mobbile/

% countries reporting use of telehealth technologies to support service delivery (January – March 2021)



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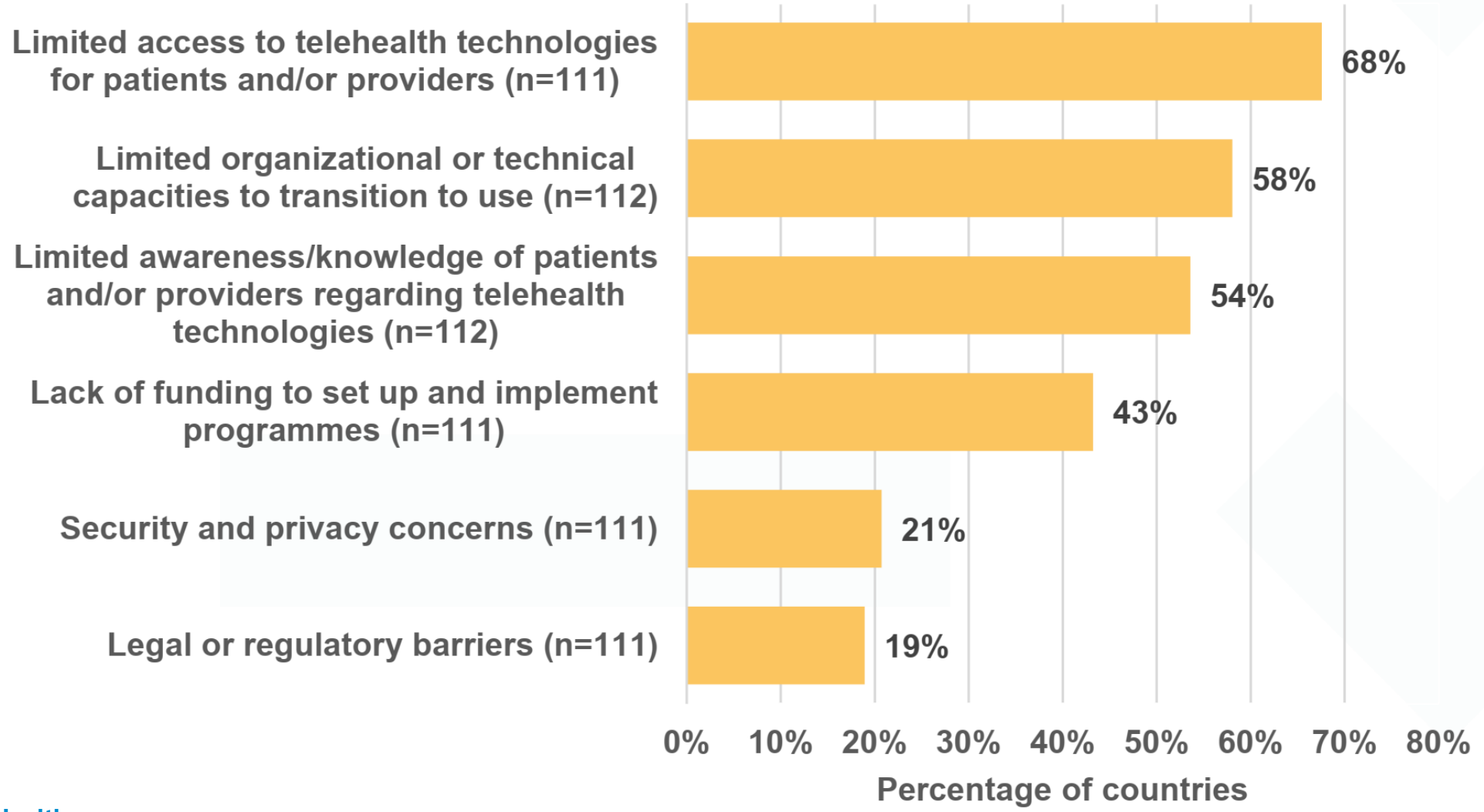
% countries reporting barriers to use telehealth technologies to support service delivery (January – March 2021)



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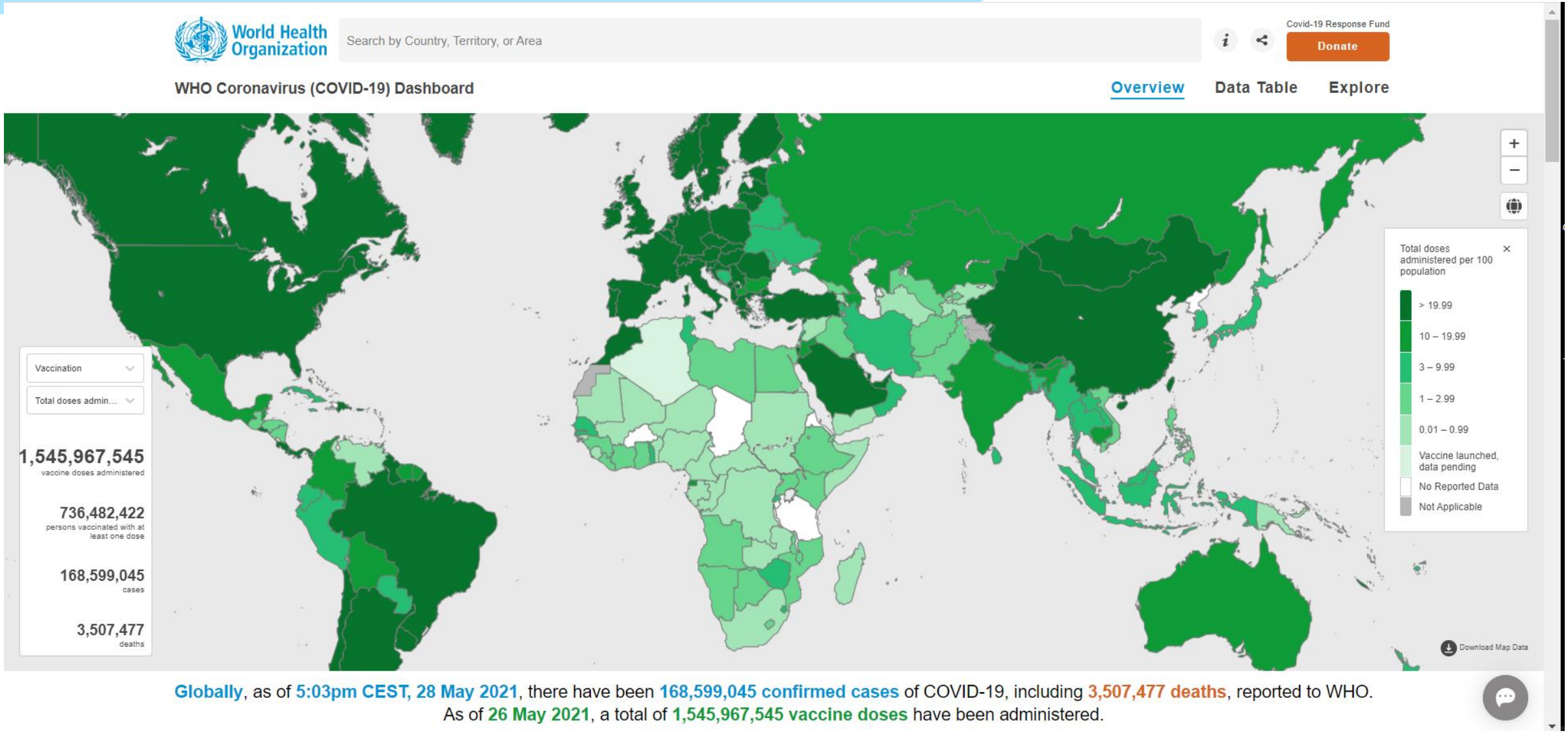
Rapid data for advocacy



https://covid19.who.int/

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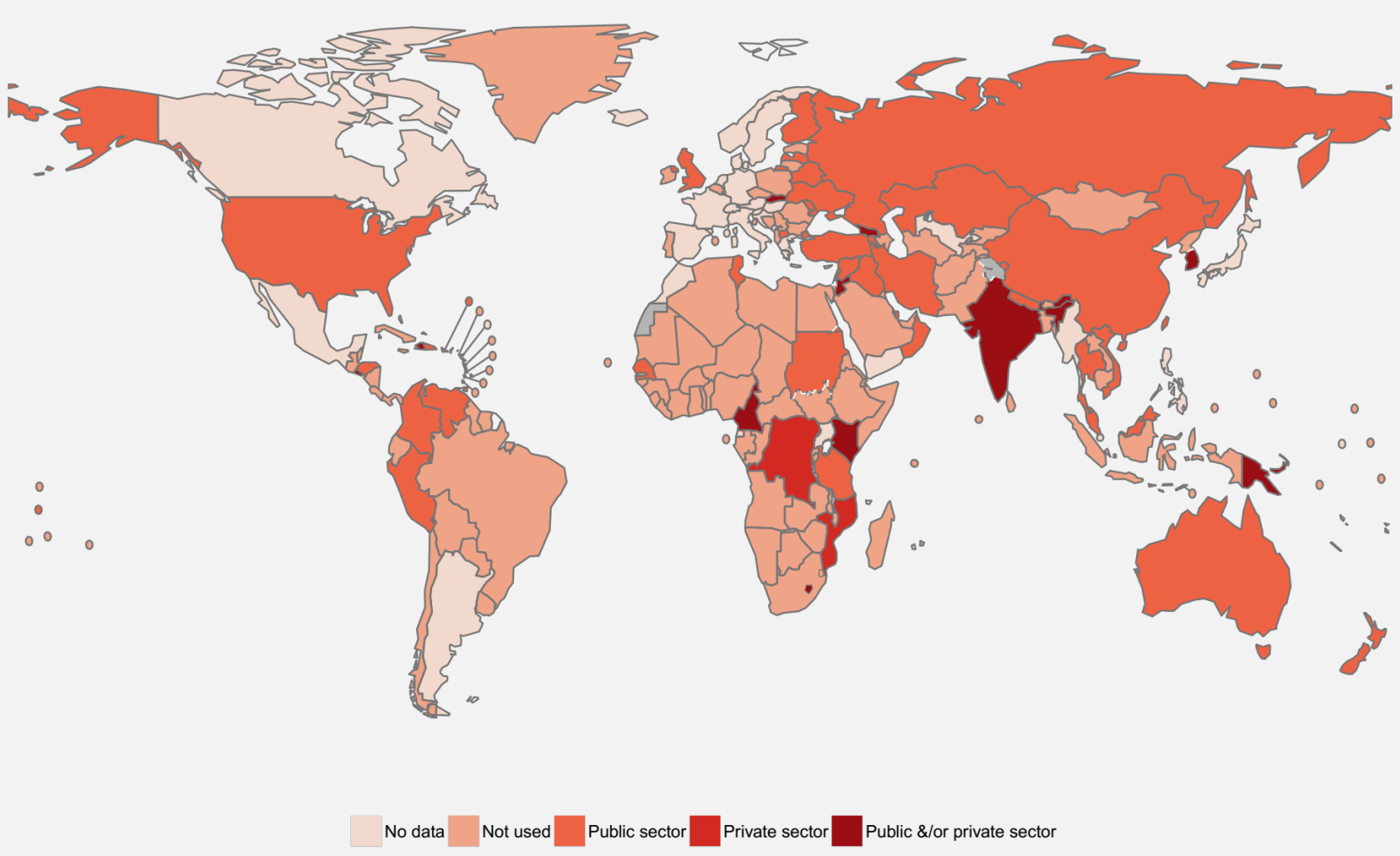
Are SMS, video, electronic medication monitors or other digital technologies in use to support patients at risk of interrupting TB treatment?



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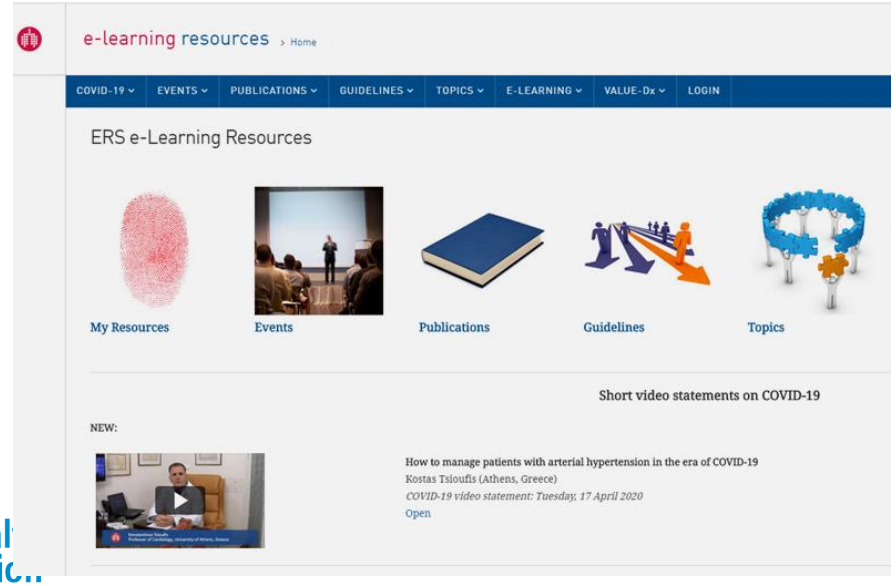
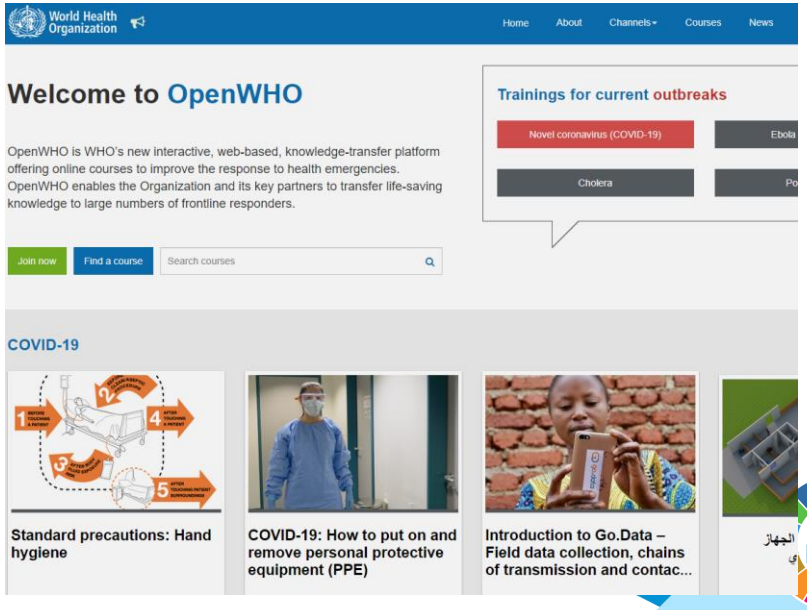
Communication & capacity building (1)

Paperless teaching has been extensively employed since the early days of computing and Internet. Many training curricula for healthcare professionals now incorporate at least some degree of eLearning, aspiring to blend virtual with classroom style teaching. Creative interactive methods and gaming approaches are being used.

https://www.ers-education.org



https://openwho.org/



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https://extranet.who.int/tbknowledge

Sharing

https://extranet.who.int/tbknowledge

English

Consolidated Guidelines | Operational Handbooks | Training Catalogue | Quick Search | Recommendations | Log in

WHO TB KNOWLEDGE SHARING PLATFORM

Access the modular WHO guidelines on tuberculosis, with corresponding handbooks and training materials.

Consolidated Guidelines

WHO guidelines provide the latest evidence-informed recommendations on TB prevention and care to help countries achieve the Sustainable

Operational Handbooks

The WHO Operational Handbooks on tuberculosis provide users with practical "how to" guidance, with details essential for the proper implementation of

Training Catalogue

The WHO Training Catalogue on tuberculosis consists of online eLearning courses and other training materials to help users implement the

Communication & capacity building (2)

Chatbots are automated programmes that provide callers with information in a manner that simulates human interaction. They can reply to set FAQs or even free text or speech inputs.

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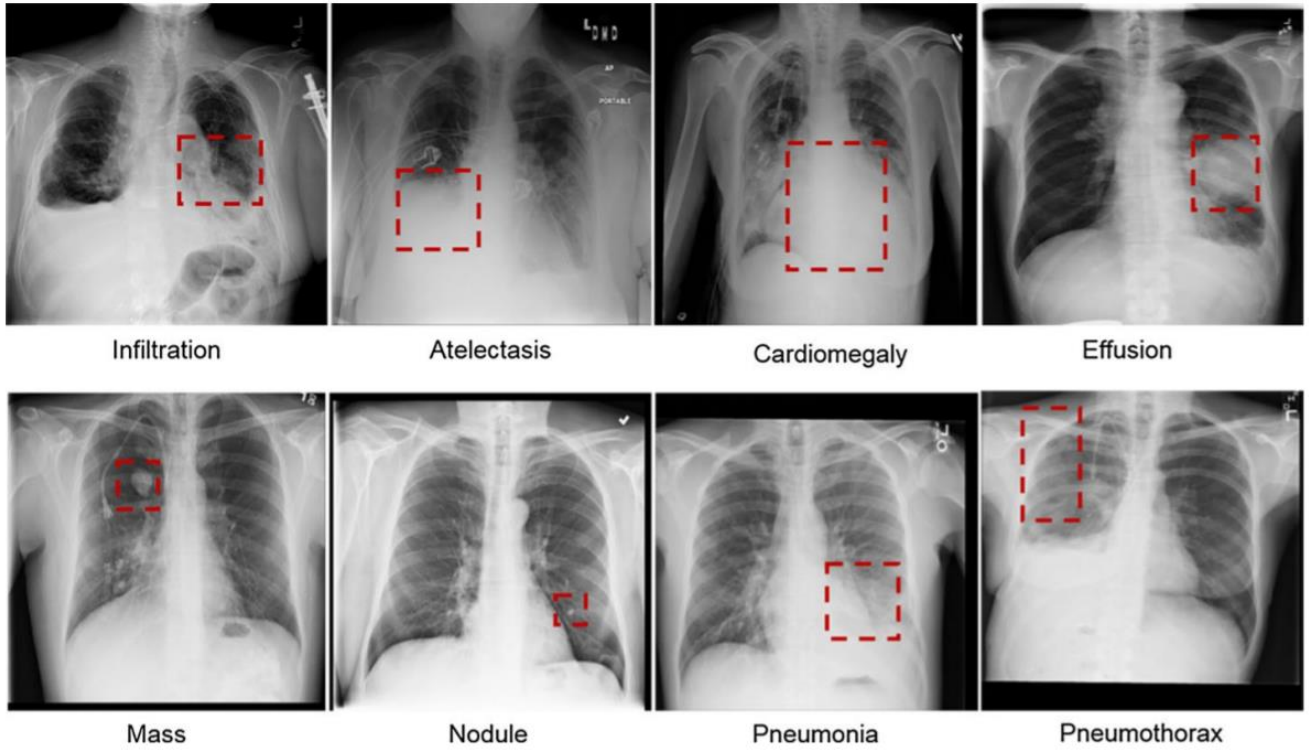
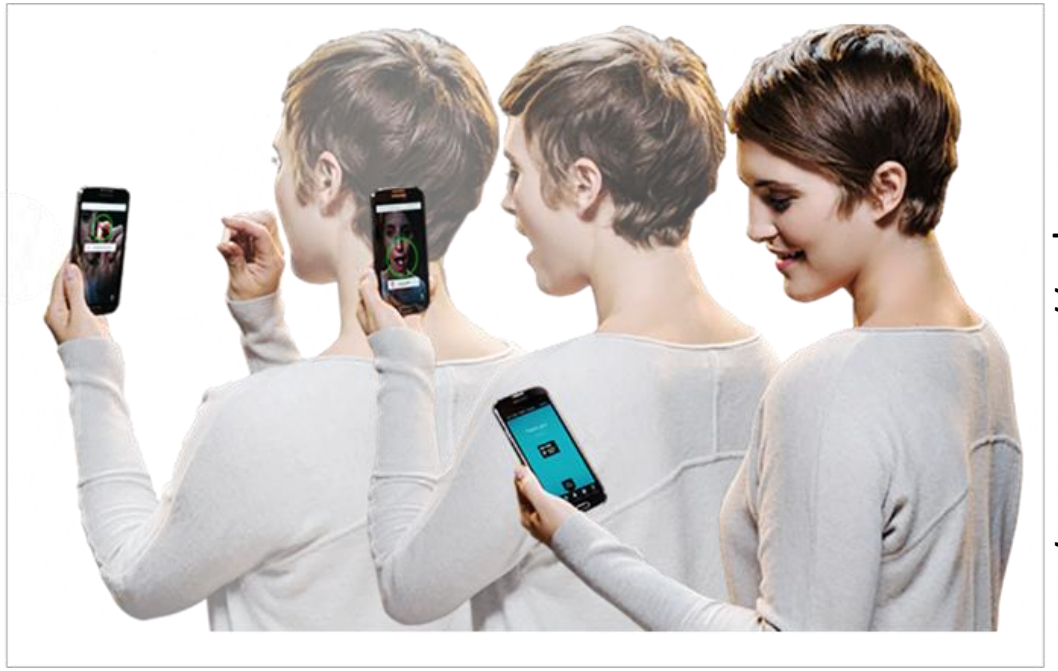
Applications of AI in TB care

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6103992/





https://aicure.com/

Implementation research

https://www.ir4dtb.org/

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Moving forward

- New opportunities to improve TB prevention and care as digital innovations evolve

- Technologies developed for one health condition may benefit other emergent challenges

- Evidence for improved effectiveness, quality of care and efficiency at large scale remains critical. Data need to be collected alongside all investment in innovation

Acknowledgements

Many patients

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