Digital Health

Spring 2025

UNIVERSIDAD POLITÉCNICA DE MADRID

Agenda

5
Telehealth and Telemedicine

- Questions from last week?
- Learning objectives: Discipline literacy; critical analysis skills, applied and integrative learning
- Icebreaker: If you could have dinner with anyone alive or dead, who would that be?
- Lecture and videos, case studies/DQs
- AI in Medical and Dental Education
- Guest speaker
- Next session – M Health, reflection, readings, guest speaker

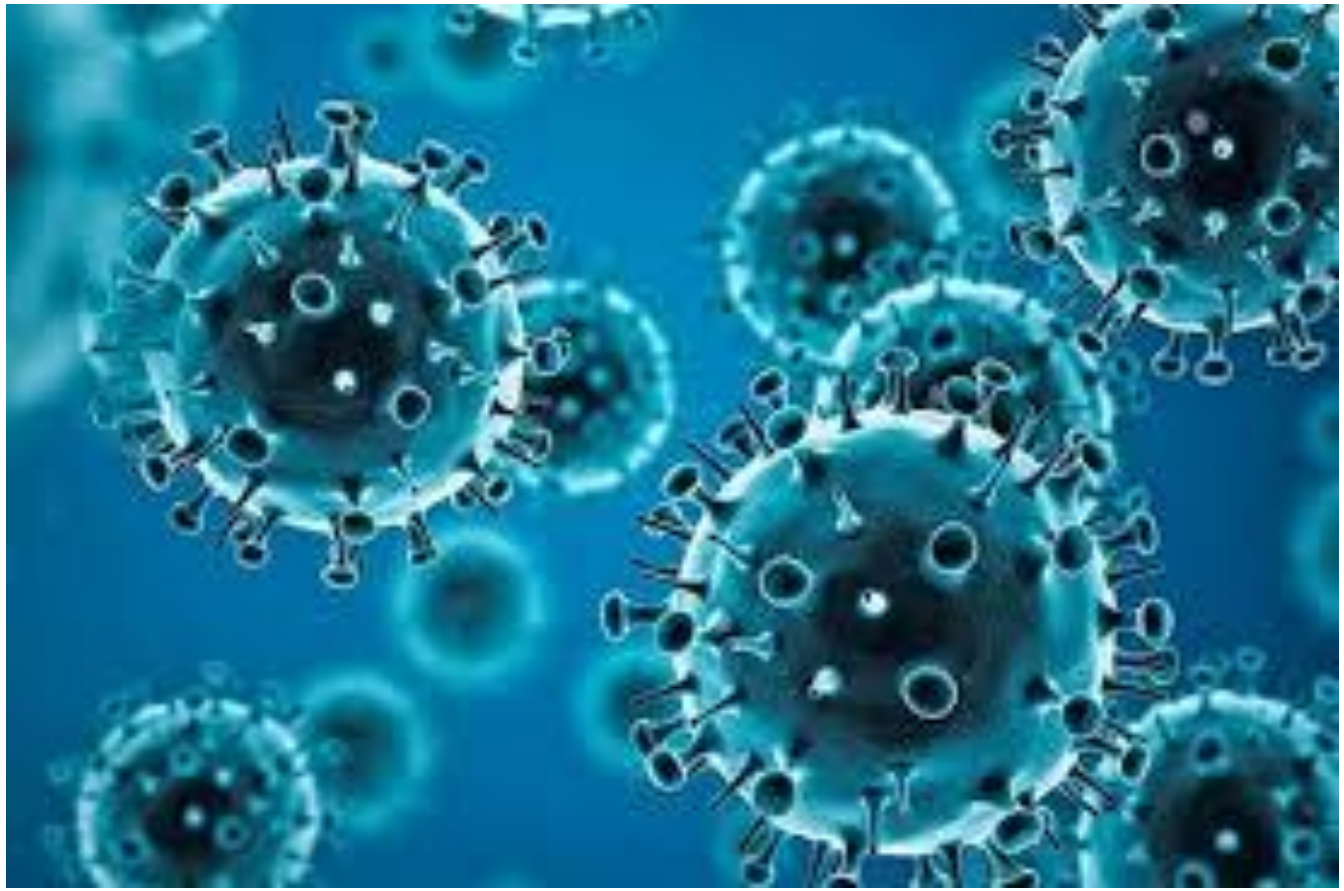
Definitions

- Telemedicine refers specifically to remote clinical services, such as diagnosis and treatment consultations and monitoring.
- Telemedicine technology enables virtual physician and patient interaction and communication through audio, audio with video, or web-based videoconference.

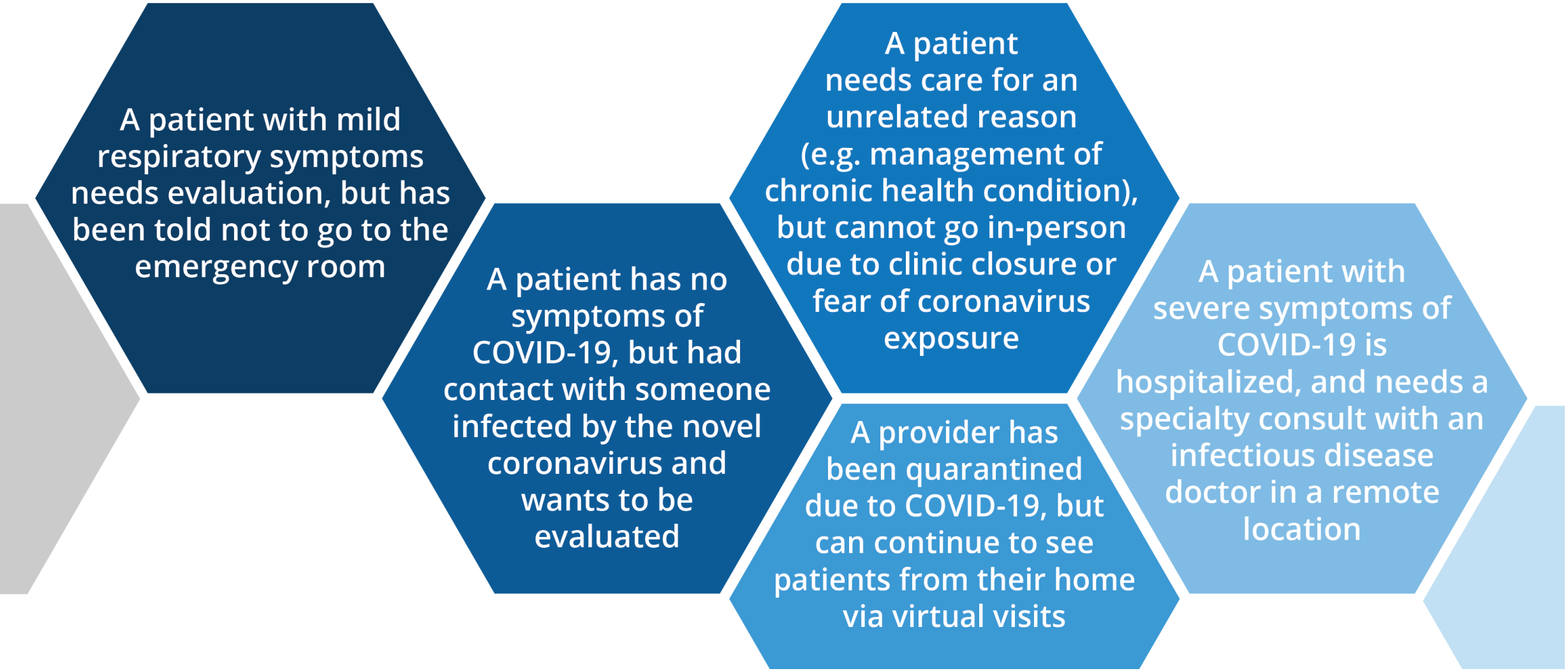
- Telehealth refers to remote non-clinical services such as provider training, medical education, or administrative meetings, such as prescription renewals.

- Often used interchangeably

COVID, COVID, COVID;
Use of Telemedicine Skyrocketed



Telemedicine Is Being Used in Many Scenarios During the COVID-19 Pandemic:

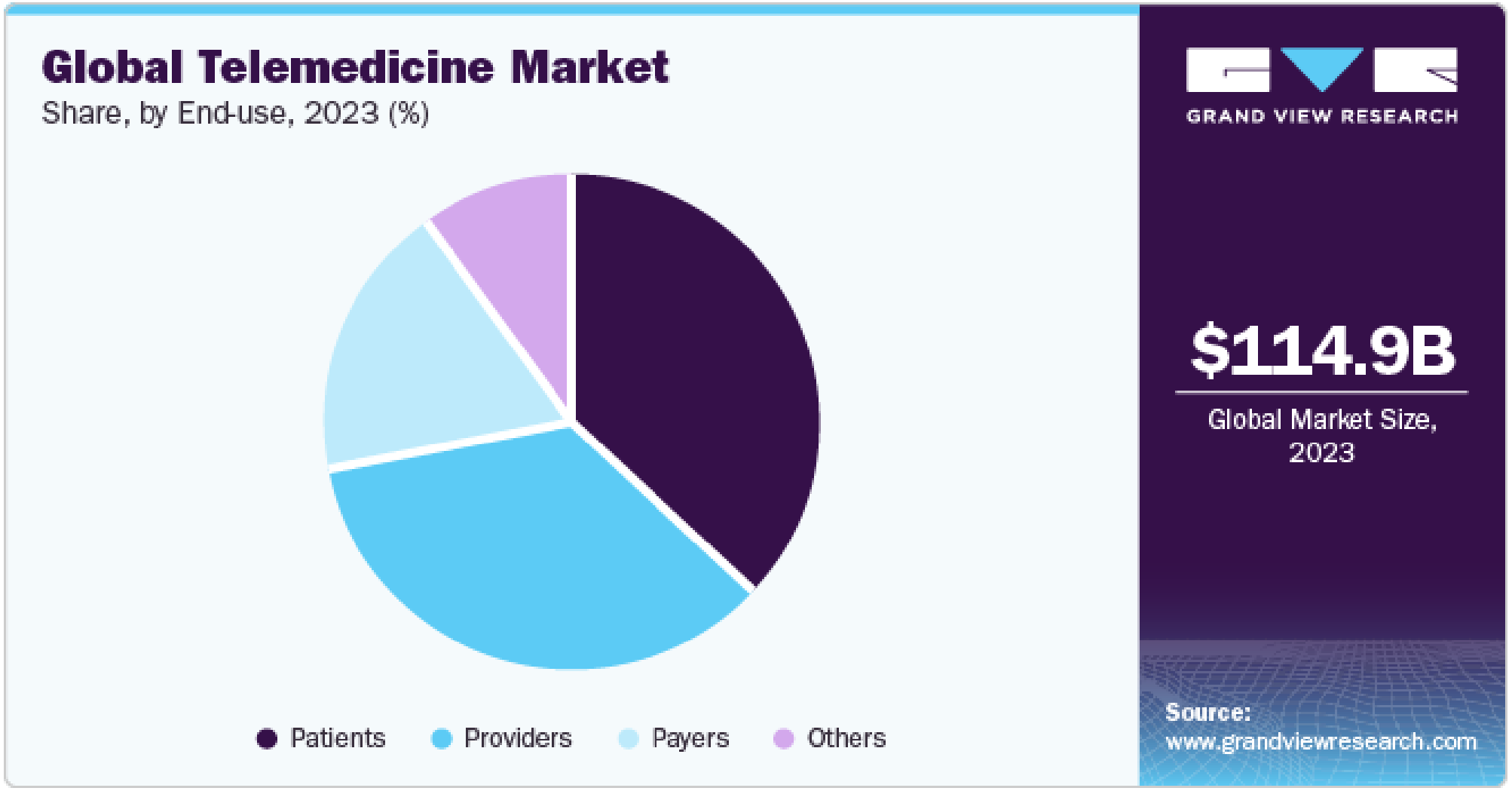


DISRUPTION

- Prior to the pandemic, 9 countries (Estonia, Hungary, Iceland, Ireland, Korea, Luxembourg, Mexico, Türkiye and the U.S.) allowed medical consultations to be performed only in the physical presence of the patient.
  - Australia, Canada and Portugal, teleconsultations were only between **0.1% and 0.2%** of all appointments.

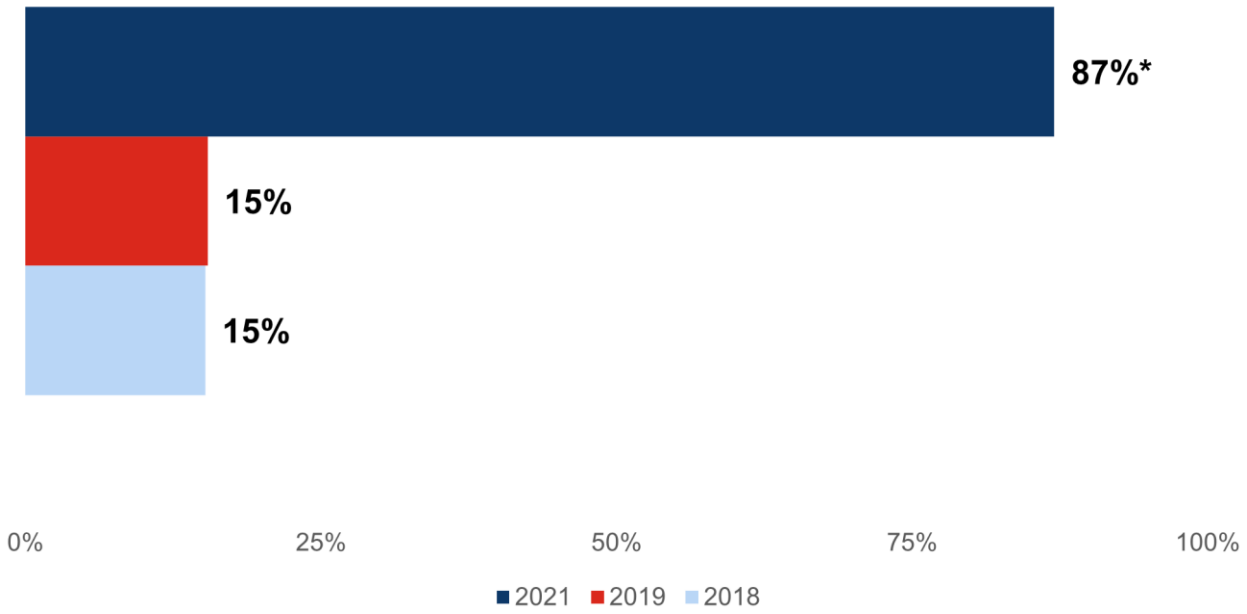
- Massive regulatory and government changes in oversight and payment during Covid pandemic.
  - 8 countries (Belgium, Czech Republic, England, Estonia, Hungary, Korea, Latvia and Luxembourg) began paying for teleconsultations through government/compulsory schemes.
  - In Belgium, Germany, Japan, Portugal, and the United States, key purchasers (eg, Medicare) use both fee-for-service and global budgets to pay providers of telemedicine services.

- https://www.oecd.org/coronavirus/policy-responses/the-future-of-telemedicine-after-covid-19-



Growth 2024-2030 of 17.9%

Use of telemedicine by office physicians in the U.S.



- https://www.healthit.gov/data/data-briefs/use-telemedicine-among-office-based-physicians-2021

Telemedicine – U.S.

- Assist hospitals in monitoring newly released patients in an effort to prevent readmissions from complications after discharge.
- Chronic conditions managed such as diabetes and high blood pressure.
- The U.S. Veterans Administration (VA) Care Coordination/Home Telehealth Program
  - Monitored and cared for more than 70,000 military veterans with chronic diseases in 2012, and patient satisfaction levels were greater than 85%.
  - More than $9,000 in savings per patient due to the reduction in the number of hospitalizations.[6]

U.S. Study Showed …

https://www.healthit.gov/data/data-briefs/use-telemedicine-among-office-based-physicians-2021

- Over 70% of physicians reported patients' difficulty using telemedicine tools as the most common barrier.
- A majority of physicians (62%) were fully or somewhat satisfied with the use of telemedicine.
- Over 80% of physicians plan to continue using telemedicine after the pandemic.
- Telemedicine platform integration varies across EHR systems; physicians with an Epic EHR (48%) reported use of the telemedicine platform.

Telemedicine - Spain

- Spain was the country with the largest share of people receiving a telemedicine consultation during the peak of the pandemic among EU countries.
- Over 7/10 Spaniards had a medical consultation online or by phone.
- In comparison, only ¼ people in France had a telemedicine consultation.
- By the end of 2023, the average revenue per user of online doctors' consultations is $220 for a market of 1.3 million users in Spain, a total of $295 million – an increase of 312% compared to 2017.

https://www.statista.com/topics/11521/telemedicine-in-spain/#topicOverview

Telemedicine – United Kingdom

- United Kingdom General Practitioner Consultations
  - Digital consultations (including telephone or video) tripled between January 2020 and January 2022
  - Drivers: tightening healthcare budgets, increasing energy costs, the ongoing cost-of-living crisis, reducing waiting times and clearing backlogs in the National Health Service (NHS).
  - A fragmented and largely unregulated landscape, combined with the impact of data protection laws and recent advancements in AI present challenges to public and private sector.
  - Challenges: risk of misdiagnosis, concerns about privacy, denial of access to certain services, and a hesitance by patients.
  - One study by the University of Cambridge (2021) showed that rheumatology patients and physicians overwhelmingly thought that telemedicine was worse than in-person consultations for accuracy and trust.

- https://www.lexology.com/library/detail.aspx?g=d5a11b30-ac6b-4d6f-b633-8b8c5bc017e1

Big Data from Telemedicine!

Full report: Leading practices for the future of telemedicine | OECD

Table 2.1. Summary of data collection practices of responding OECD countries (2024)

Country	Regular data on telemedicine activity available, granular by mode and demographics	Dedicated evaluation process, strategy, or office with structure in place to routinely collect data and review policy or financial decisions
Australia	YES	YES
Belgium	YES	YES
Canada	YES	YES
Croatia	YES	YES
Czechia	NO	NO
France	YES	YES
Germany	IN DEVELOPMENT	YES
Israel	IN DEVELOPMENT	NO
Korea	NO	NO
Latvia	NO	IN DEVELOPMENT
Poland	YES	NO
Portugal	NO	NO
Slovenia	NO	IN DEVELOPMENT
Sweden	NO	NO
Türkiye	YES	YES
United States	YES	YES

Source: Authors

Telemedicine around the world

- **Rural India** (2 minutes)
- https://www.weforum.org/videos/edisonalliance-india/
- Telemedicine is Changing Healthcare in Rural India | World Economic Forum
- **Kenya** (1 minute)
- Kenya's Telemedicine Efforts
- **Pros and Cons** (2.5 minutes)
- https://www.rand.org/multimedia/video/2021/03/17/pros-and-cons-of-telehealth.html
- Pros and Cons of Telehealth | RAND

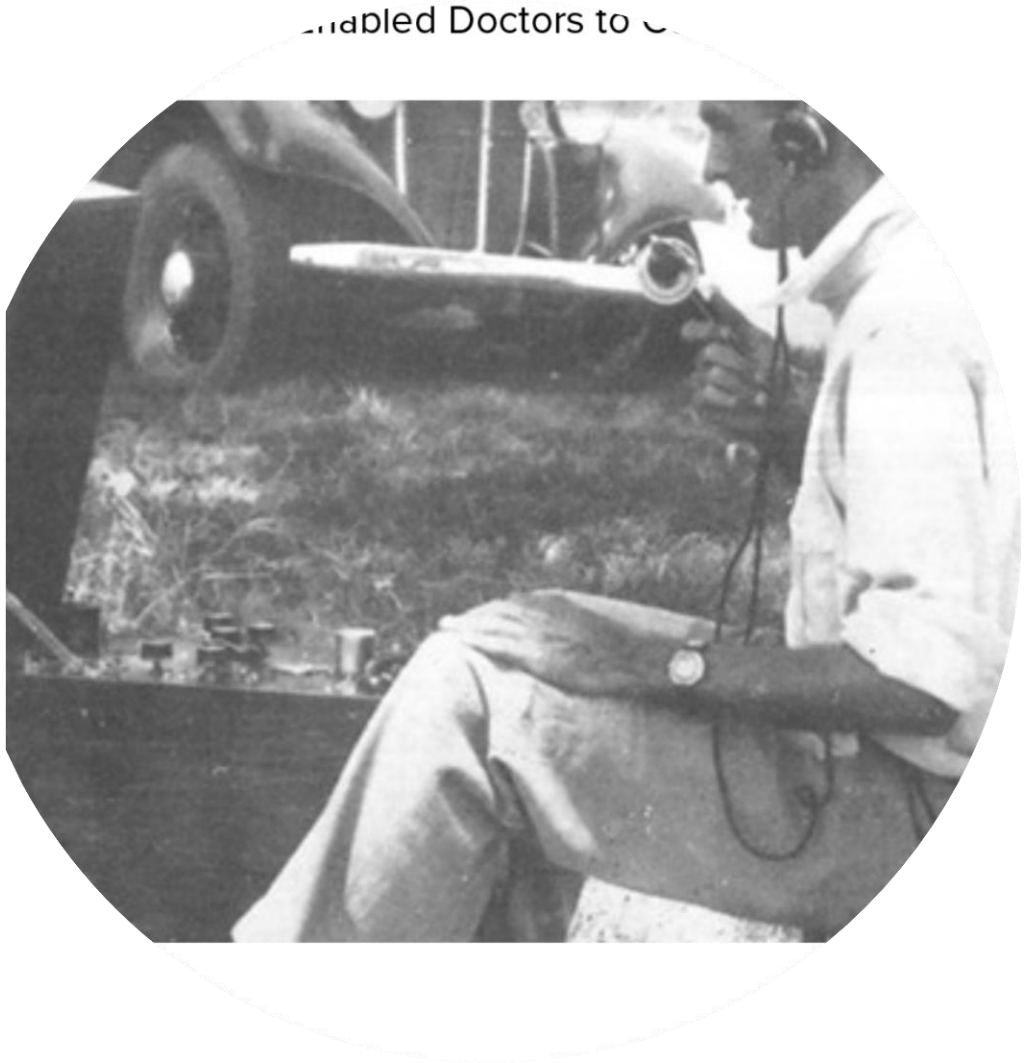
Telemedicine history

THE LANCET

- 1879 report from The Lancet Journal
  - A physician listened to a baby's cough through a phone receiver to help determine whether the baby had croup.

- 1920s Two Way Radio Communication
  - The Haukeland Hospital in Norway started using two-way radio communication to connect physicians with ships and enable medical treatment of seafarers

Telemedicine history



- Australian outback in the 1920s
  - The Royal Flying Doctor Service had a challenge
  - Medical services were needed by a disparate population scattered over a massive country
    - A network was developed of over 3,000 pedal-operated generators and radio receivers, enabling remote construction and the first large-scale telemedicine system

Telemedicine history

- 1960s
  - Telemedicine was used to monitor astronauts' vital signs and psychological status
- 1980s
  - First commercial application, MedPhone, developed a system using standard telephone lines to remotely diagnose and support treatment for patients requiring cardiac resuscitation.

Who is offering Telemedicine?

- Applications offered **directly to consumers**
  - Download an app and play a flat monthly subscription fee, eg, Headspace, GoodRxCare
- Applications offered **by insurance companies**
  - Large insurers provide access to remote care for a fee or co-pay, eg, Kaiser Permanente
- Applications offered **by employers**
  - 90% of large employers in the U.S. now offer free virtual consultations, eg, Doctegrity
- Applications offered **by physician offices or hospitals**, eg, athenahealth

Companies providing Telemedicine Applications

- ZOOM – 22.8% market penetration in the U.S.
- Amwell, Boston, U.S.A., Hybrid Care at Scale, https://business.amwell.com/
  - Connect patients with doctors over secure video via a subscription service.
- MDLive Inc. is a telehealth and on-demand healthcare provider with services that cater to patients, hospitals, healthcare providers, employers, etc.
  - Cloud-based platform.

Teladoc (www.teladochealth.com)

- Founded in 2002, in USA
  - Uses telephone, videoconferencing software, and mobile apps to provide on-demand remote medical care
  - Active in 130 countries, serving 80 million people
  - Common app used in Spain
  - Business in Canada, Israel, France, Latin America, U.S.
  - Acquired many smaller telemedicine companies

  - Video (1 minute advertisement)
  - Bing Videos

Many companies providing telemedicine applications

- **Bask Health**, NYC, Allows doctors to develop their own direct-to-consumer telehealth platform with visits and prescribing.
- **Doctor on demand**, SanFrancisco, U.S.A. www.doctorondemand.com
  - Connect with a doctor over live video in minutes. Available 24/7, nights and weekends.
  - Connect – with or without insurance – to high-quality physicians, saving valuable time and money.
- **HealthJoy**, Chicago, U.S.A. https://healthjoy.com/
  - Help employees navigate the healthcare system

Telemedicine Advances and the Future

- Today, doctors and nurses call, text, and video conference with patients to deliver remote care
- Drivers
  - Faster internet connections
  - Ubiquitous smartphones
  - Changing insurance/payment standards
  - Shortage of trained physicians
- Goals
  - Seamless care pathway
  - Flexibility and accessibility
  - Saving money
  - Good value for patients and physicians
  - Need for regulation and oversight
  - Research on utilization needed

Telemedicine Challenges

- Patient privacy
- Doctors cannot examine patients
- Data security
- Preventing cyber attacks
- Interoperability with an EMR
- Patient record keeping
- Rules, regulations, and legal issues
- Reimbursement
- Technical training
- Who and how is data being collected? Uses?
- Broadband connection

Telehealth

- Telehealth Case Studies (DigHealthTeleDQs)

Summary: Telehealth and telemedicine

- Is there a difference in the terms?
- What have been some of the drivers of telemedicine usage?
- How do you convince patients or physicians to use it?
- What are some of the challenges with telemedicine?

Next Session

- Homework: Write a 2 page reflection on your thoughts about innovation in healthcare. What is the most challenging problem today in medicine in your country or globally? Can it be solved with technology? In other words, if you could wave a magic wand, what problem would you solve in healthcare? Explain.
- Next week: M health: Consumer and patient power
  - Apps, virtual reality, wearables, monitoring, gamification, and other tools
- Watch: CNN: Can VR cure your fear of heights? April 2020
- Can VR Cure Your Fear Of Heights?
- https://www.google.com/search?q=fear+of+heights+virtual+reality+exposure+therapy&rlz=1C1JZAP_enUS848US849&oq=fear+of+heights+virtual+reality+&gs_lcrp=EgZjaHJvbWUqBwgAEAAYgAQyBwgAEAAYgAQyBggBEEUYOTIICAIQABgWGB4yCAgDEAAYFhgeMggIBBAAGBYYHjIICAUQABgWGB4yCAgGEAAYFhgeMggIBxAAGBYYHjIICAgQABgWGB4yDQgJEAAYhgMYgAQYigXSAQk3NzE5ajBqMTWoAgiwAgE&sourceid=chrome&ie=UTF-8#fpstate=ive&vld=cid:3bbc07e1,vid:qhsJD-2loZE,st:0
- Frontiers | Virtual Reality Exposure Therapy for Fear of Heights: Clinicians' Attitudes Become More Positive After Trying VRET