

OVERVIEW OF TELEHEALTH TERMINOLOGY AND MODALITIES

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University of Cincinnati

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National Academies of Sciences, Engineering and Medicine - National Academies Workshop on Telehealth
for Disability Assessment

Background

Education –

BS – The Ohio State University, 1980
MBA – The University of Dayton, 1988

My thoughts

Faculty –

Professor of Public Health Sciences, Department of Environmental and Public Health Sciences – MPH Program Director/Interim Division Director* (*Appointment in Political Science)
Director, UC Space Research Institute for Discovery and Exploration
(Faculty appointments at George Washington University, Wright State University, Yale University, Virginia Commonwealth University – Medical College of Virginia, International Space University)

Other Activities –

Member National Quality Forum – Telehealth Committee
Co-Chair – Federal Telehealth ‘FedTel’ working group
Co-Chair – Governance Committee – NATO, Romania/Russia Multinational Telemedicine System for Emergencies
Fulbright Specialist - US Department of State’s Bureau of Education and Cultural Affairs (BECA) and Council for International Exchange of Scholars - Macedonia
Special Assistant to the Chief Health and Medical Officer, NASA Headquarters, Washington, DC (NASA – Funded)
Book Editor – Space Physiology and Medicine – Evidence and Practice, 4th Edition, Springer
Book Editor – Engineering, Life Sciences, and Health/Medicine Synergy in Aerospace Human Systems Integration ‘The Rosetta Stone Project
Book Editor - Telemedicine, Telehealth, and Telepresence: Principles, Strategies, Applications and New Directions.
Editor-in-Chief, Telemedicine and e-Health Journal
Editorial Board / Reviewer for 55+ international journals
Published >400 books, book chapters, peer-reviewed manuscripts, editorials, perspectives and federal/state reports
Travel to conduct research, teach or implement healthcare systems (telemedicine) in numerous countries

Definitions

- ❑ Depends on who you ask?
- ❑ Legislative intent – Federal
- ❑ Associations (ATA, AMA, ACP, etc.)
- ❑ States – wide variety

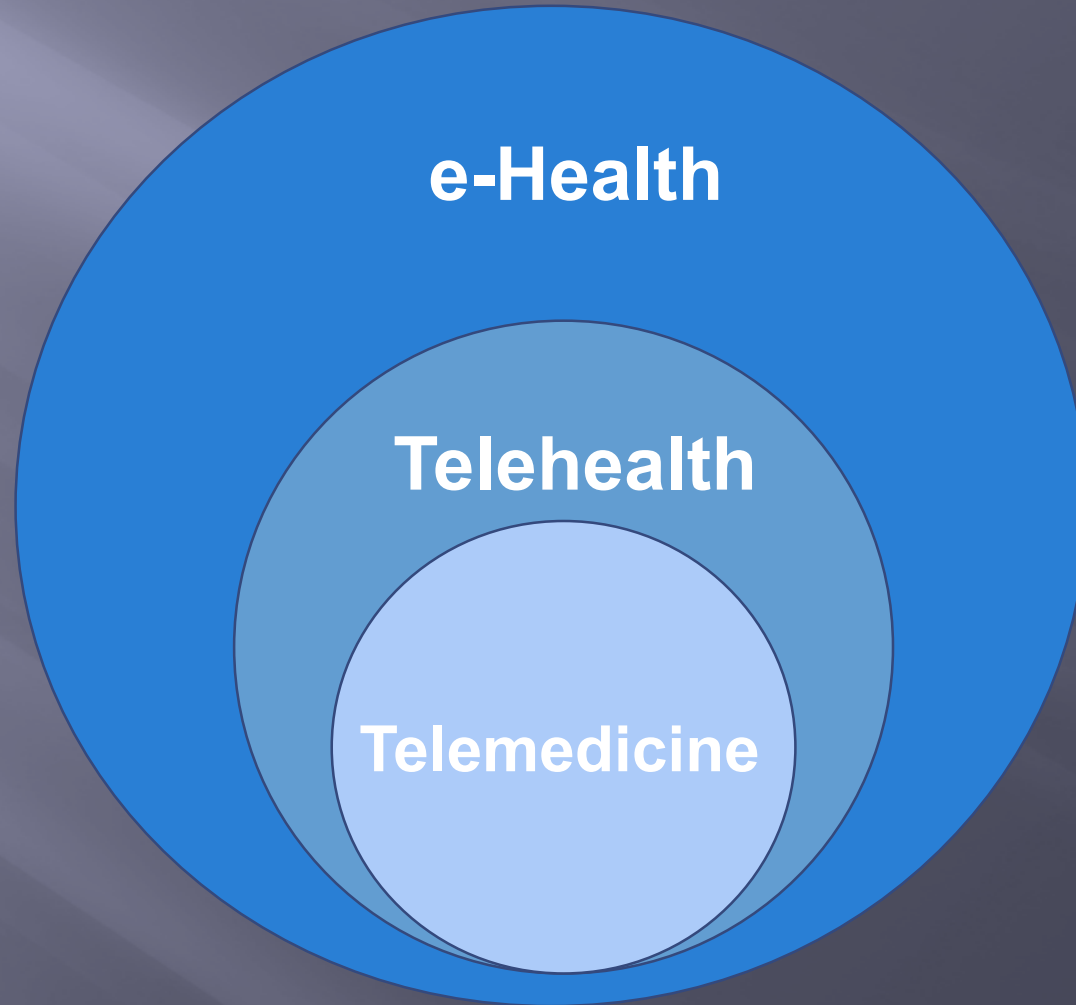


1. Doarn CR, Pruitt S, Bott DM, Riley W, Lamer C, Oliver, A, Jacobs J. The US Government's Approach to Defining Telehealth. *Telemed J E Health* 2014;20(5):409-18.
2. Sood S, Jugoo S, Dooky R, Mbarika V, Prakash N, Merrell RC, Doarn CR. What is telemedicine?: 104 peer-reviewed perspectives and theoretical underpinnings. *Telemed J E Health* 2007;13(5):573-90. – Cited – 548 times

Definitions

mHealth

Personalized
Health



e-Health

Telehealth

Telemedicine

Historical Perspectives



1924



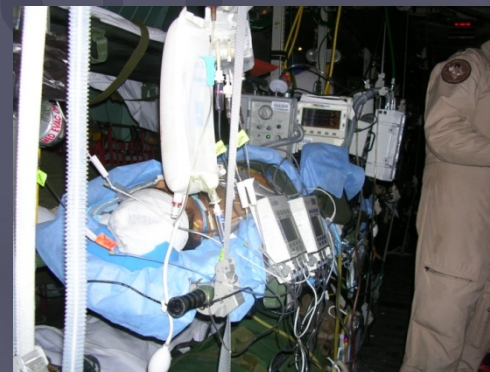
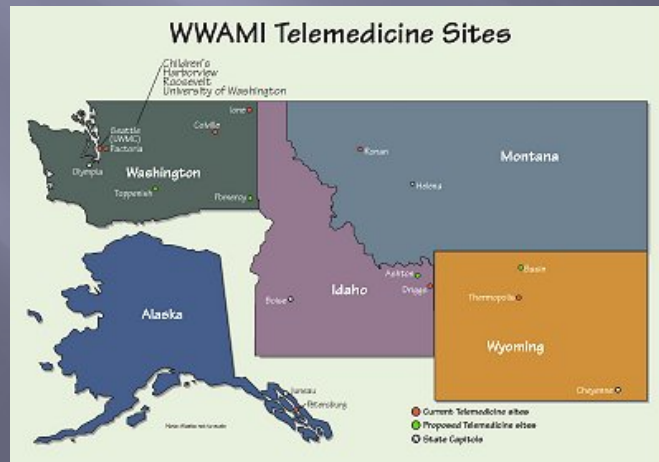
1929



1931

We Begin in the 1950s

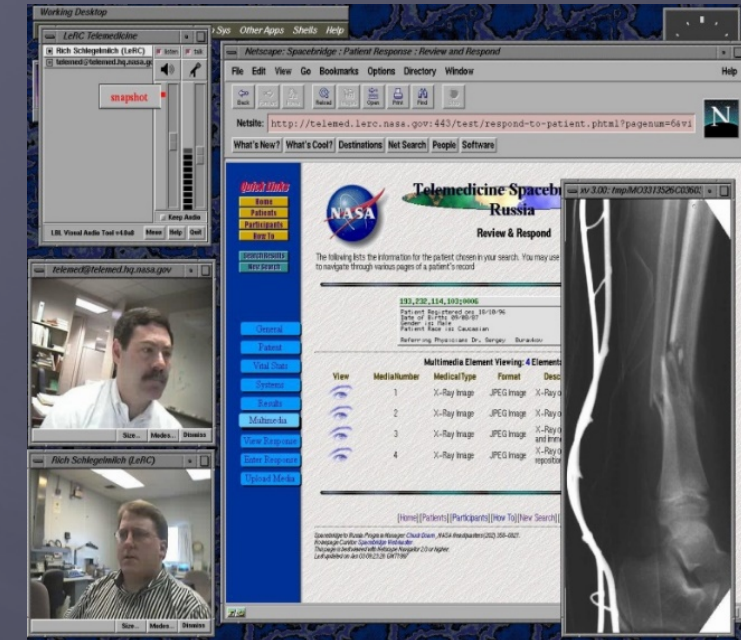
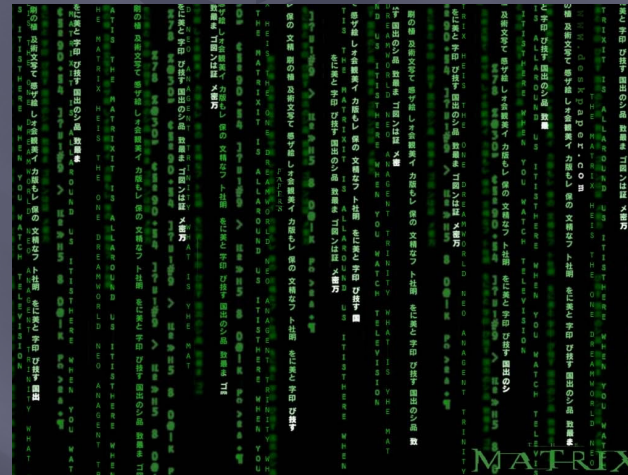
- ❑ Nebraska 1950s
- ❑ Space Exploration (early 60s)
- ❑ Mass General (mid 60s)
- ❑ WAMI (1970)
- ❑ STARPAHC (mid 70s)
- ❑ Disasters (mid 80s)
- ❑ Military (early 1990s)



Change

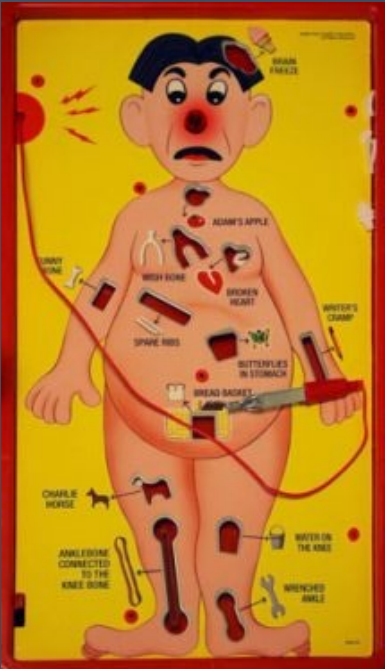
- ❑ World Wide Web
- ❑ Online CME
- ❑ Health Information Technology (HIT)
- ❑ Data – lots and lots of data
 - ❑ Everywhere and from everything
- ❑ Records
 - ❑ EMR/EHR
 - ❑ Vital records - informatics

Crazy!



- ❑ Informatics
- ❑ Willingness to Pay
- ❑ Technology
- ❑ Training
- ❑ Acceptance
- ❑ Legislation
- ❑ Attitudes
- ❑ Leadership or lack

- ❑ Leadership or lack of it!!



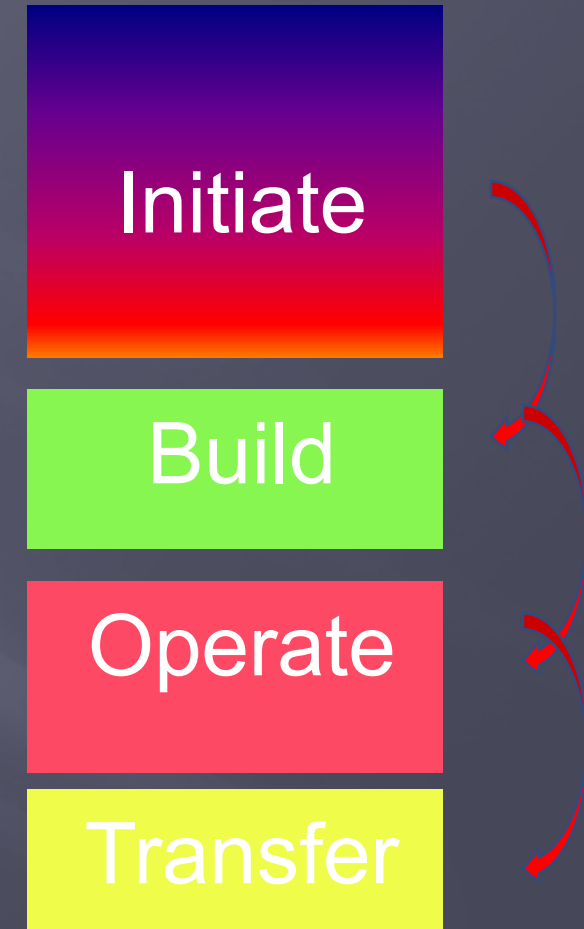
Modalities

- ❑ Synchronous
- ❑ Asynchronous
- ❑ Remote monitoring
- ❑ AI/Robotics



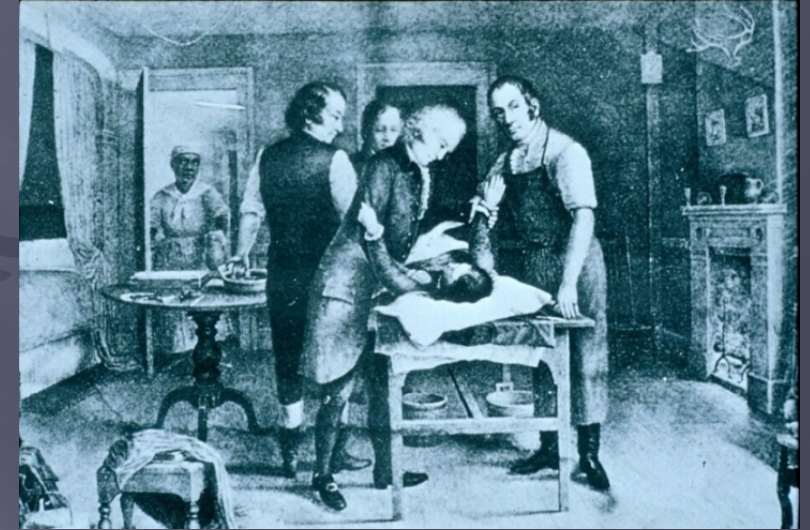
Systems Approach

- ☐ Needs assessment
- ☐ Identify the problem(s)
- ☐ Identify a champion
- ☐ Solicit input from all involved
- ☐ Develop a plan
- ☐ Train / educate / prepare
- ☐ Implement
- ☐ Conduct the plan
- ☐ Review the plan – feed back
- ☐ Transition the plan



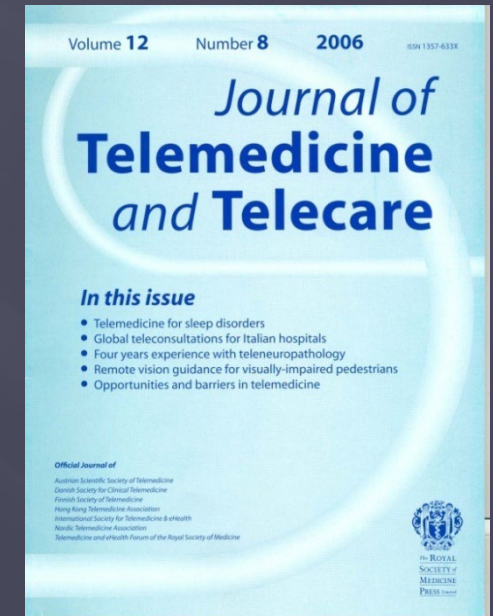
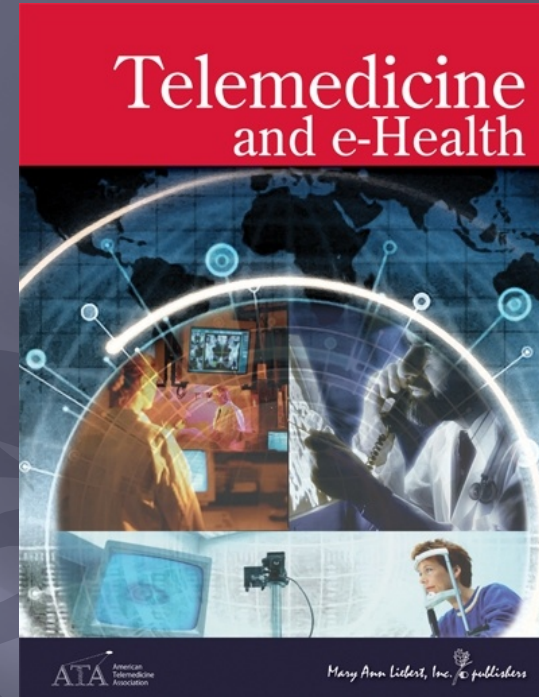
Applications

- ☐ Virtually all medical disciplines/specialties
- ☐ Home-based care
- ☐ Patient Centered Medical Home
- ☐ Virtual presence
- ☐ Accessibility
- ☐ Consumer awareness
- ☐ Growing acceptance



Evidence Base

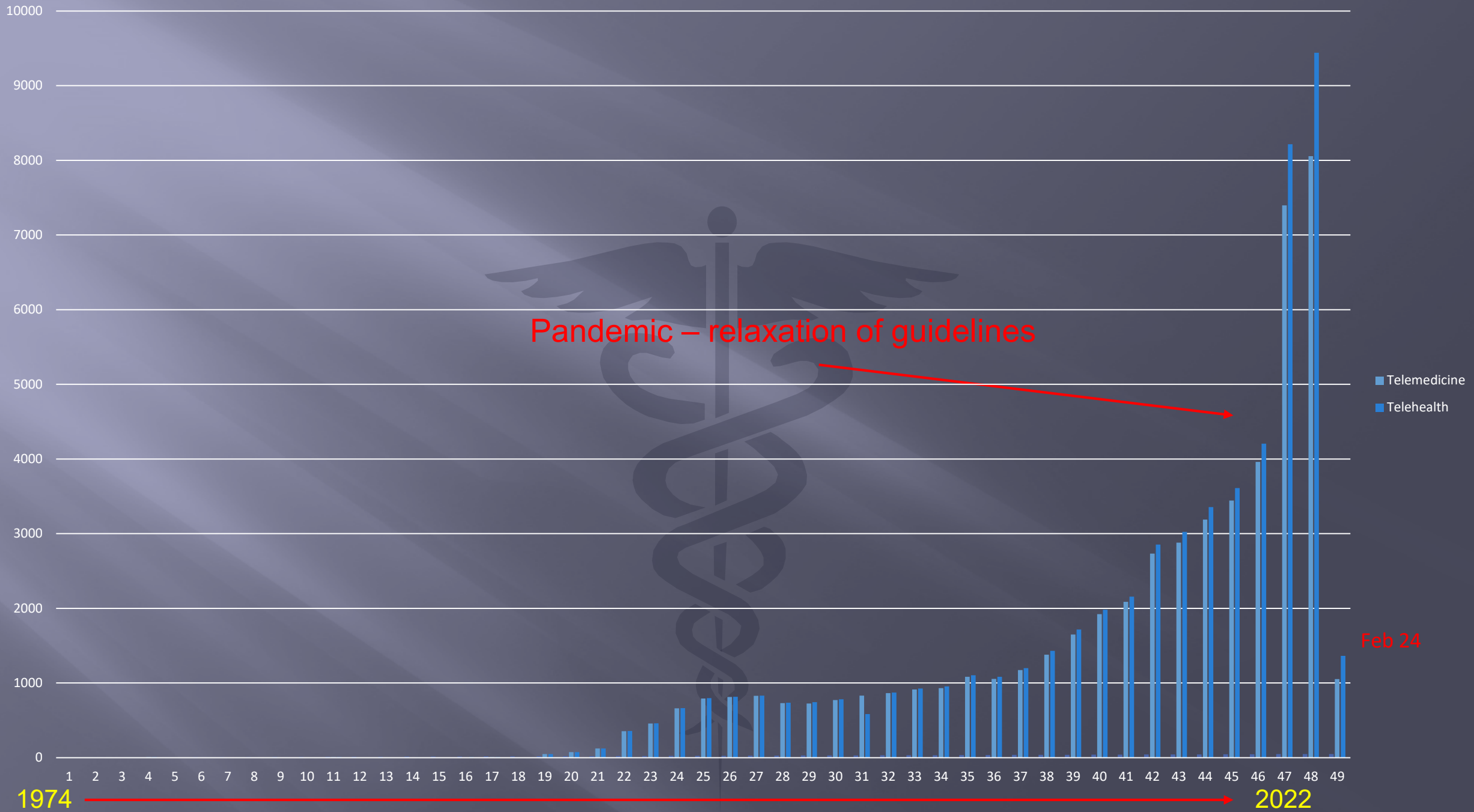
- Telemedicine and e-Health Journal
- Journal of Telemedicine and Telecare
- Intl J Telemedicine & Applications
- Annual Rev CyberTherapy & Telemedicine
- Ukranian J Telemedicine & Medical Telematics
- J eHealth Technology & Application
- European J ePractice
- Intl J e-Health & Medical Communication
- J Pervasive & Mobile Computing
- J Healthcare Engineering
- J Health & Technology
- J Technology in Human Service
- Journal of Smart Homecare Technology and TeleHealth
- Others Specialty Journals
 - JAMA
 - Health Affairs
 - BMJ
 - NEJM



Decade	Telemedicine (TM)	Telehealth (TH)	COVID	TM & COVID	TH & COVID
1900-1970	0	0	0	0	0
1971 – 1980	26	28	0	0	0
1981 - 1990	30	38	0	0	0
1991 – 2000	4,153	4,172	0	0	0
2001 – 2010	9,077	8,984	0	0	0
2011 – 2019	23,243	24,332	39	1	1
2020	7,397	8,215	89,505	3,547	3,877
2021	8,056	9,440	135,583	4,288	5,306
2022 - Feb	1,053	1,364	21,593	580	743
TOTAL	53,035	56,573	246,751	8,416	9,657

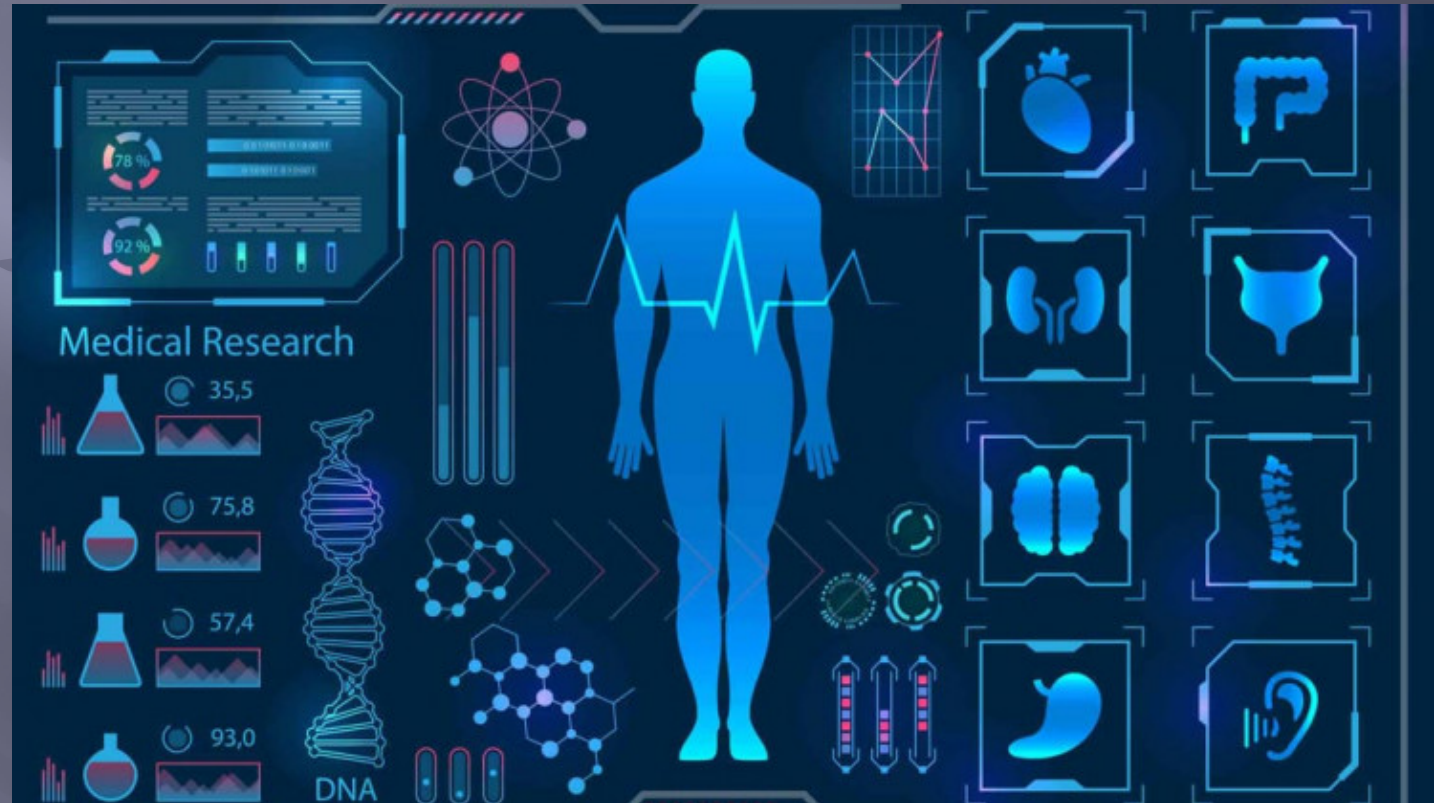
Source – PubMed – February 24, 2022

Growth in Publications of Telemedicine and Telehealth 1974 - 2021



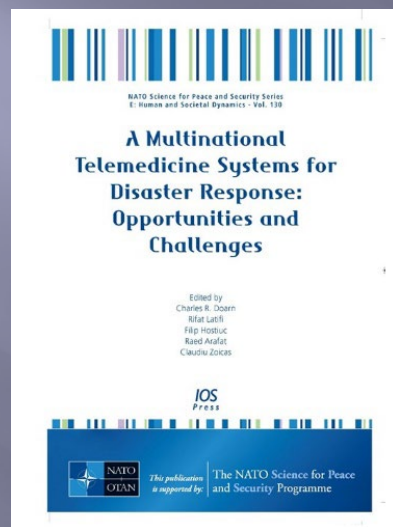
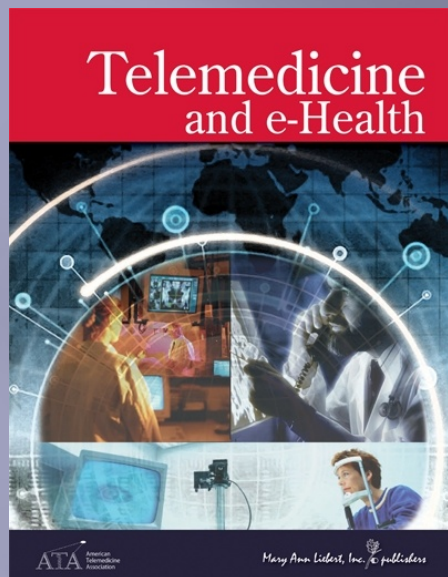
Humans and Robots

- ☐ Tasks
- ☐ Relationships?
- ☐ Soft robotics
- ☐ AI Dx



Source: Labmedia

1. <https://www.wired.com/2017/10/hiroshi-ishiguro-when-robots-act-just-like-humans/>
2. Yamaguchi H. “Intimate relationship” with “virtual humans” and the “socialification of familyship. *Paladyn, J Behav Robotics*. 2020;11:379-69



Evidence

