

The Evidence for Telemedicine: Recent Trends and Expectations

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As we all know

- Telemedicine saves money
- Telemedicine leads to superior clinical outcomes due to improved access and management
- Telemedicine is the clinical application of Health Information Technology
- Everyone loves telemedicine

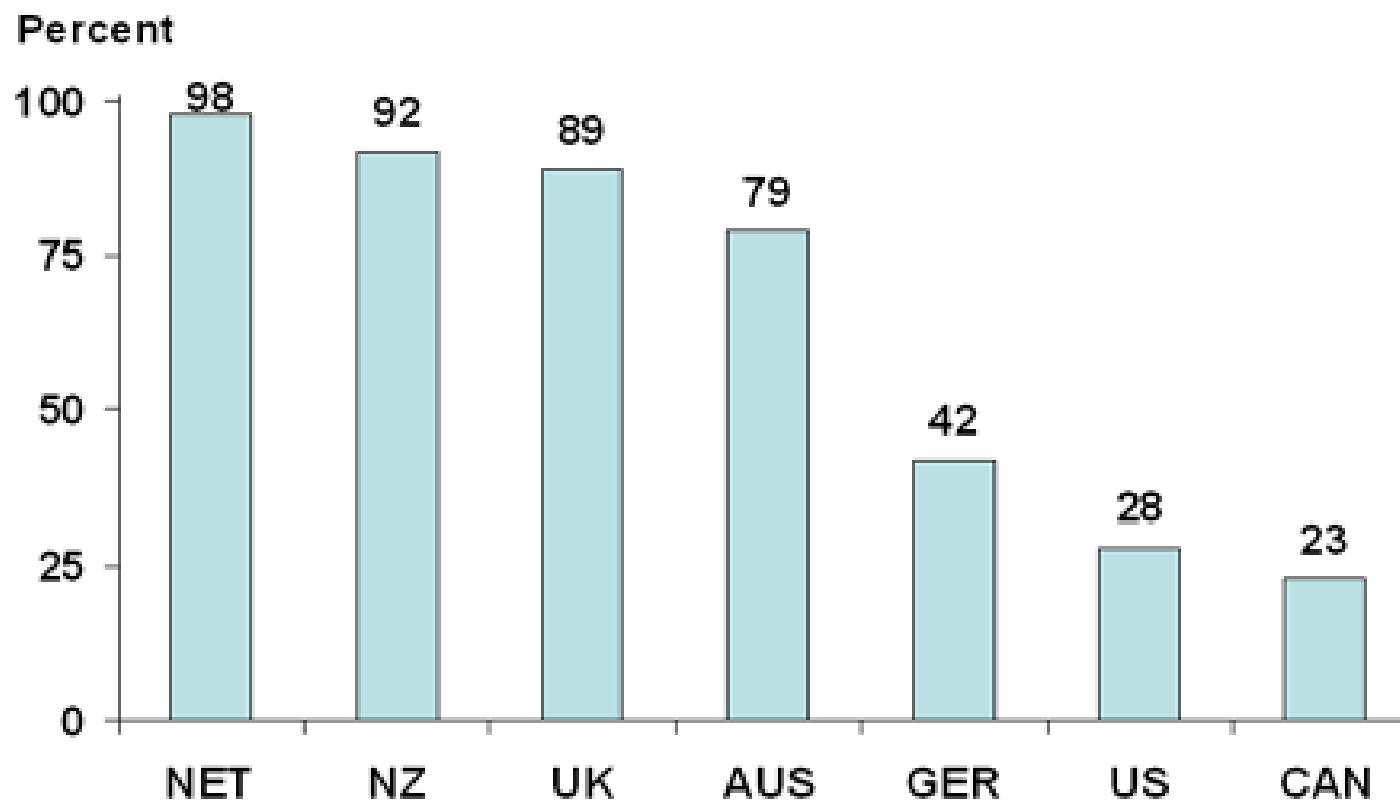
The few facts

- Cochrane database records only one review on telemedicine and that purports the lack of evidence that telemedicine is better than face to face. Yet PubMed has almost 12,000 entries of telemedicine publications
- Largest diabetic study in US did not find cost savings or improved clinical outcomes with telemedicine
- Electronic health records are used by only a minority of physician offices in the US
- After 40 years telemedicine is as yet not incorporated into the corpus of health care

Challenges to Telemedicine

- Thomas JAMA 2009. In the ICU telemedicine had no advantage over intensivists on site. Sequential studies. Thousands of patients. Carefully controlled. NIH funded.
- Himmelstein Am J Med 2009. Electronic medical records in 4000 US hospitals terribly expensive and not associated with only modestly improved clinical outcomes.

Primary Care Doctors' Use of Electronic Patient Medical Records, 2006



Source: 2006 Commonwealth Fund International Health Policy Survey of Primary Care Physicians

If you read the fine print...

Telemedicine is designed to overcome problems of access where specialists are in short supply.

Telemedicine gives a specialist greater impact.

Does not make the specialist better!

Expenditure and design for EMR is not by the people who have to use them. EMR in the US has become a war of wills. Buy what works, collect early adapters, and spend a large part of the budget on training and troubleshooting after implementation.

But what about...

- Saperstein 2009 ICU telemedicine a powerful tool to provide access to specialist care
- Dang 2009. VA telemedicine works for home health, disease management, remote care

Health Care Disparities

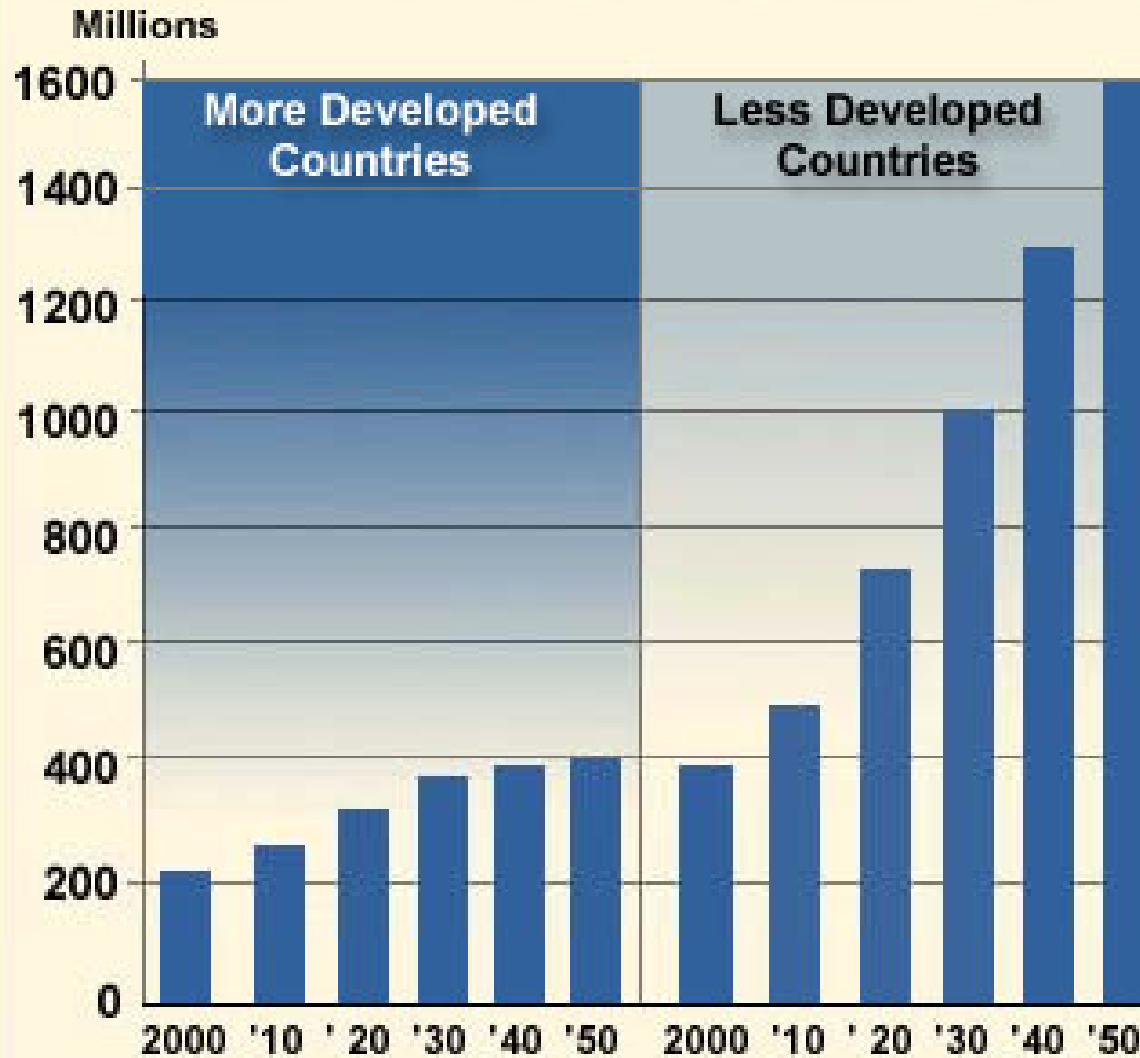
- 82% rural counties termed medically underserved
- 21% population rural
- 9% physicians practice in rural areas. median age 48. 3% recent medical students plan rural practice
- 15% rural Americans over 65. 25% above national number. Expected to double by 2030. one third limited by health.
- 1/3 more rural people covered by public health program. Medicare pays 60% less per enrollee than private insurance (1997-2006).
- Rural health facilities severely stressed by finances, technology, MR

Ischemic Stroke and rt-PA

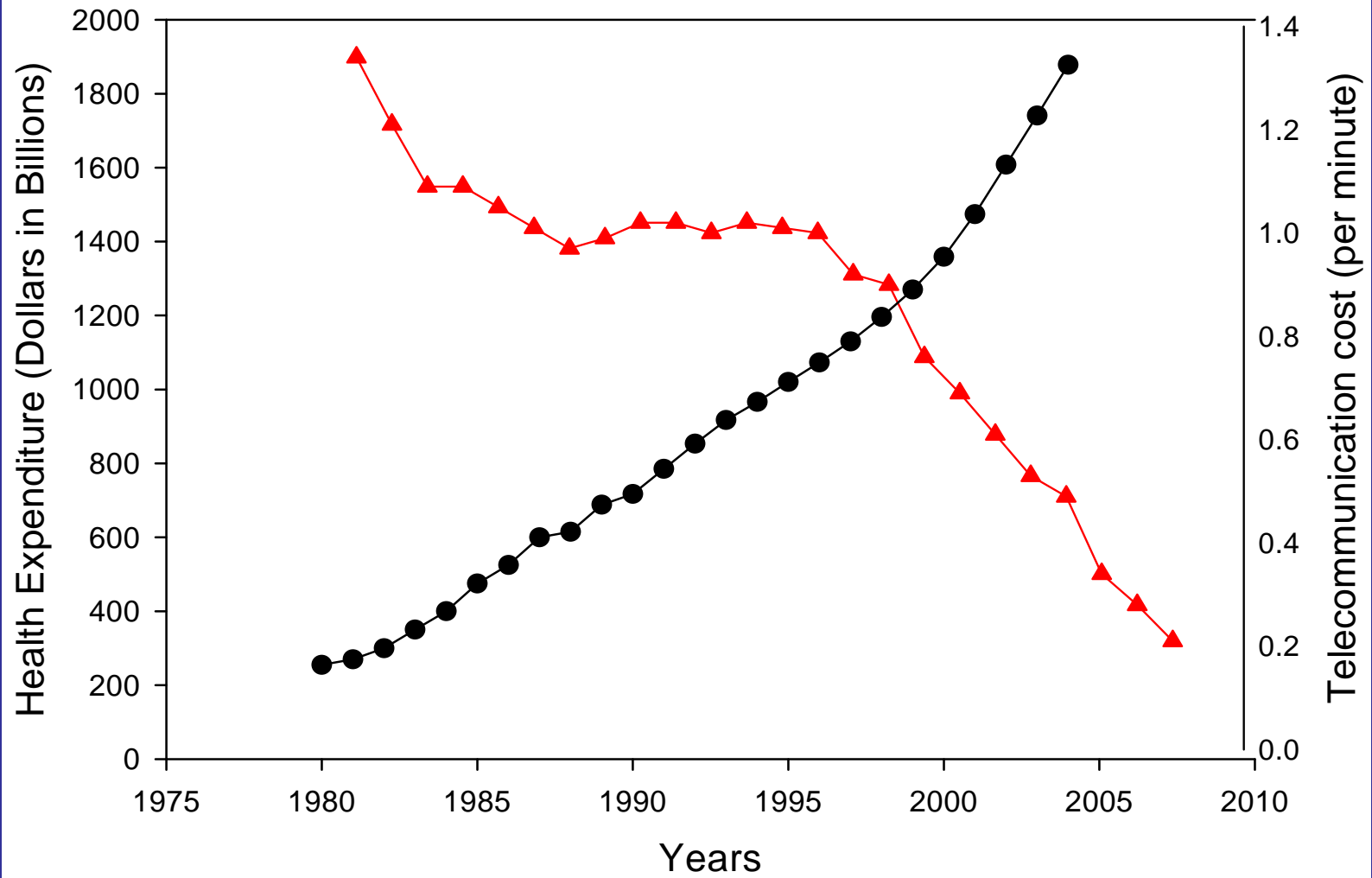
- Rt-PA can reverse or greatly limit the damage from ischemic stroke but must be given promptly on the orders of a neurologist.
- Of 4750 hospitals surveyed 2005-2007 64% had not administered this therapy to a single patient. The lack of use correlated with rural or underserved areas
- 40% of the US population lived in an areas without a hospital that had used rt-PA

» Kleindorfer. Stroke 2009;40:3580-3584.

World Population 60 and Over: 2000-2050



Source: U.S. Census Bureau, International Data Base.



▲—▲ Telecommunication Cost per minute

●—● Health expenditure & GDP

Analogies

- Breast cancer 1894-1975. radical surgery. NSABP and European centers change the answer to old questions. Collaborative, statistical power, careful protocols. After over 20 protocols surgery is no longer radical or alone in the team of caregivers and the patient is in charge of the team.
- 1968. Favoloro and the coronary artery bypass. The procedure swept the world and the human imagination and never was tested in RCT
- 1977 Gruntzig angioplasty captured the imagination of the public and aggressive cardiologists. 1990 outnumbered operations. Incomes soar
- And the data say...2004. MASS II. PCI v CABG v Medical Rx. No difference 2007. COURAGE trial PCI v medical Rx. No difference
- 1987 laparoscopic cholecystectomy in France. The patients immediately saw the advantage and would never tolerate a randomized control trial (RCT). For laparoscopic hernia the public did not see such a difference and RCT established no difference in pain, recurrence or complications. No intervention ever studied at a veterans facility in the US has shown any advantage (Except Telemedicine!!!!)

Solutions

- Test telemedicine for equivalence, not superiority
- Design studies with hypotheses that are not foregone conclusions but genuine scientific propositions
- Collaborate in large scale studies to rapidly collect statistically compelling data
- Insist on statistically meaningful data for publication
- Do not manipulate the data or refute the irrefutable. If we were wrong say so and move on

Solutions

- The national and international telemedicine organizations could play a catalytic role in organizing appropriate critical studies of telemedicine impact in increasing access, decreasing cost and improving clinical outcomes compared to controls.

You just cannot study telemedicine as you would in a laboratory

- Tell that to the patients who now survive breast cancer
- Tell that to the trauma community!!
- The statistical and logistical tools to study telemedicine exist and have the respect of the scientific and government communities

Conclusions

- Science is an orderly way to approach the unknown and not a collection of old prejudices we need to demonstrate from time to time
- Maintain integrity no matter your emotional attachment to telemedicine
- Do not trifle with the beliefs of the public (CO2)

Conclusions

- Intuition says telemedicine is a vital tool for world health
- Anecdote says telemedicine is great
- The data are weak
- There is a case to made for telemedicine and the standard tools of science will make the case

