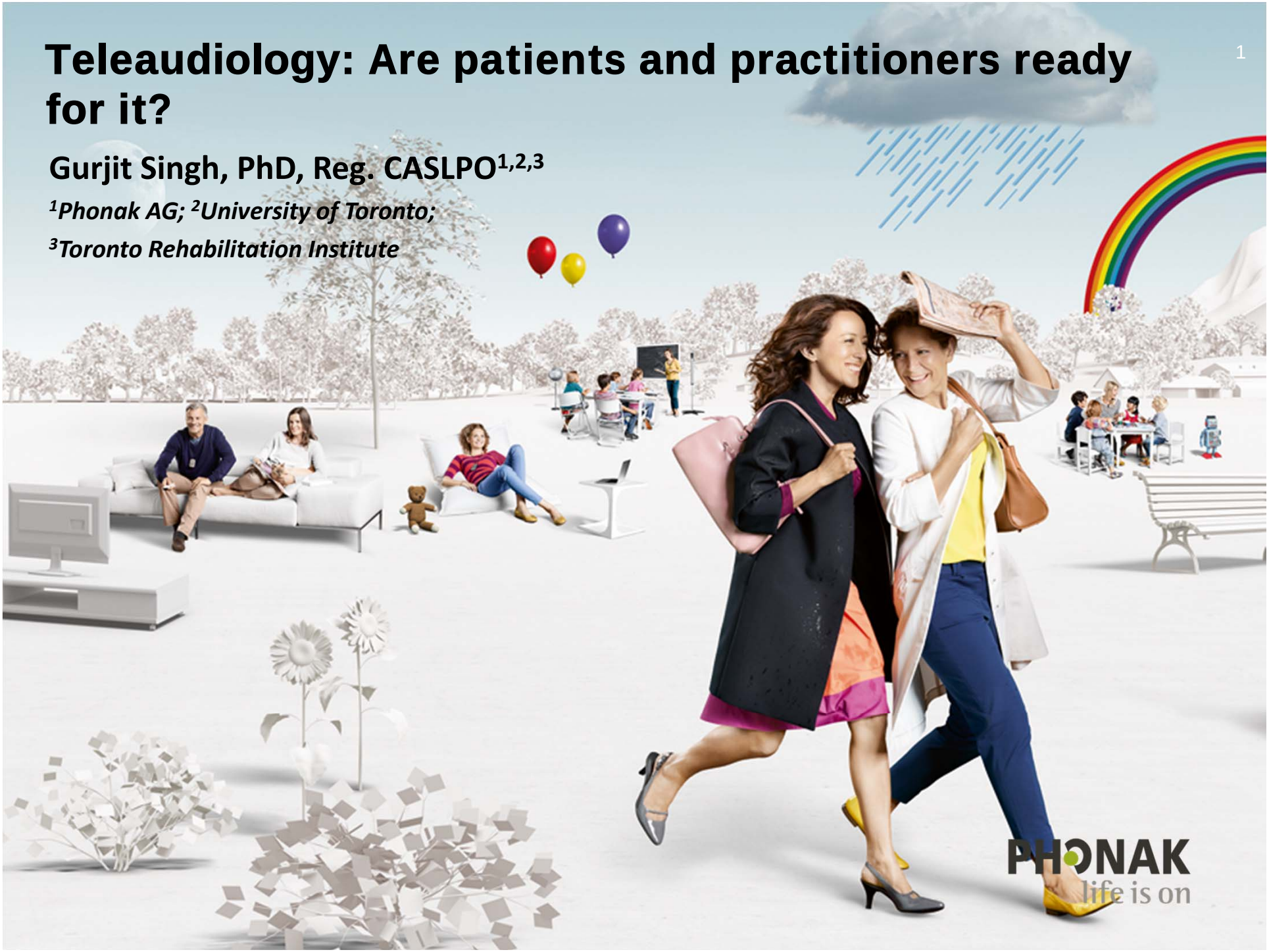
Teleaudiology: Are patients and practitioners ready for it?

Gurjit Singh, PhD, Reg. CASLPO[1,2,3]

[1]Phonak AG; [2]University of Toronto;

[3]Toronto Rehabilitation Institute



…the provision of health services from one location to another using a telecommunications medium…

Source: Darkins & Carey, 2000

“I do tech support for a HA manufacturer. I have fit patients over a telephone/internet connection several provinces away. I have been able to sort out their issues in less than 30 min without travelling. Weird at first but wonderful!”

Audiologist with 28 years of experience

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“I have done some pediatric ABRs via videoconferencing and upon talking with some families, they are more likely to get their children tested when they don't have to drive as far.”

Audiologist with 2 years of experience

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“I believe testing and fitting aids via [the] internet will reduce [the] position of audiology to that of a technician.”

Audiologist with 15 years of experience

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“I think that the whole concept of teleaudiology is horrible! Why not just invent robots to take over the profession???”

Audiologist with 7 years of experience

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Why study teleaudiology?

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Telehealth: Possible Benefits

- Increasing access to healthcare
- Reducing wait times
- Reducing medical travel
- Minimizing caregiver stress/time off paid work
- Facilitating rapid response
- Reducing CO_2 emissions
- Reducing costs of delivering healthcare
- More comfort when discussing stigmatizing issues
- Improved clinical outcomes
- Improved adherence to treatment

Clark et al., 2007; Darkins & Carey, 2000; DelliFraine & Dansky, 2008; Jennett et al., 2003; Wantland et al., 2004; Watanabe et al., 1999

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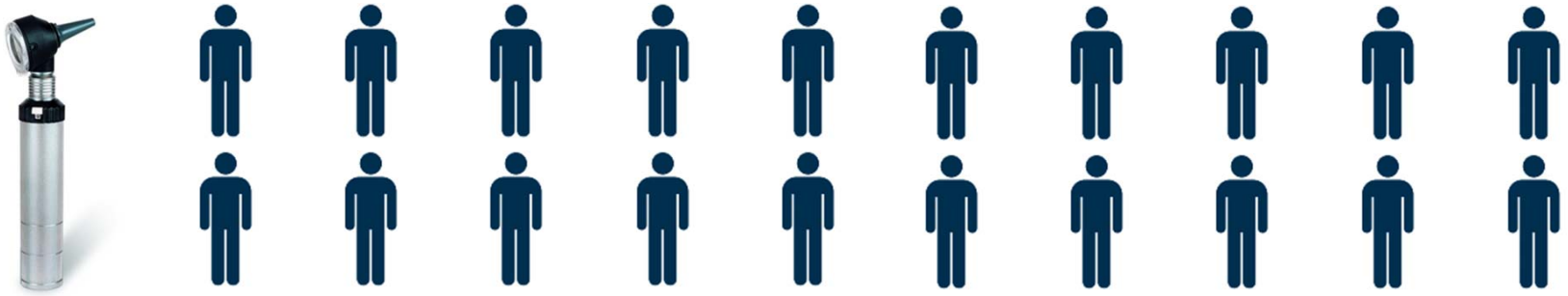
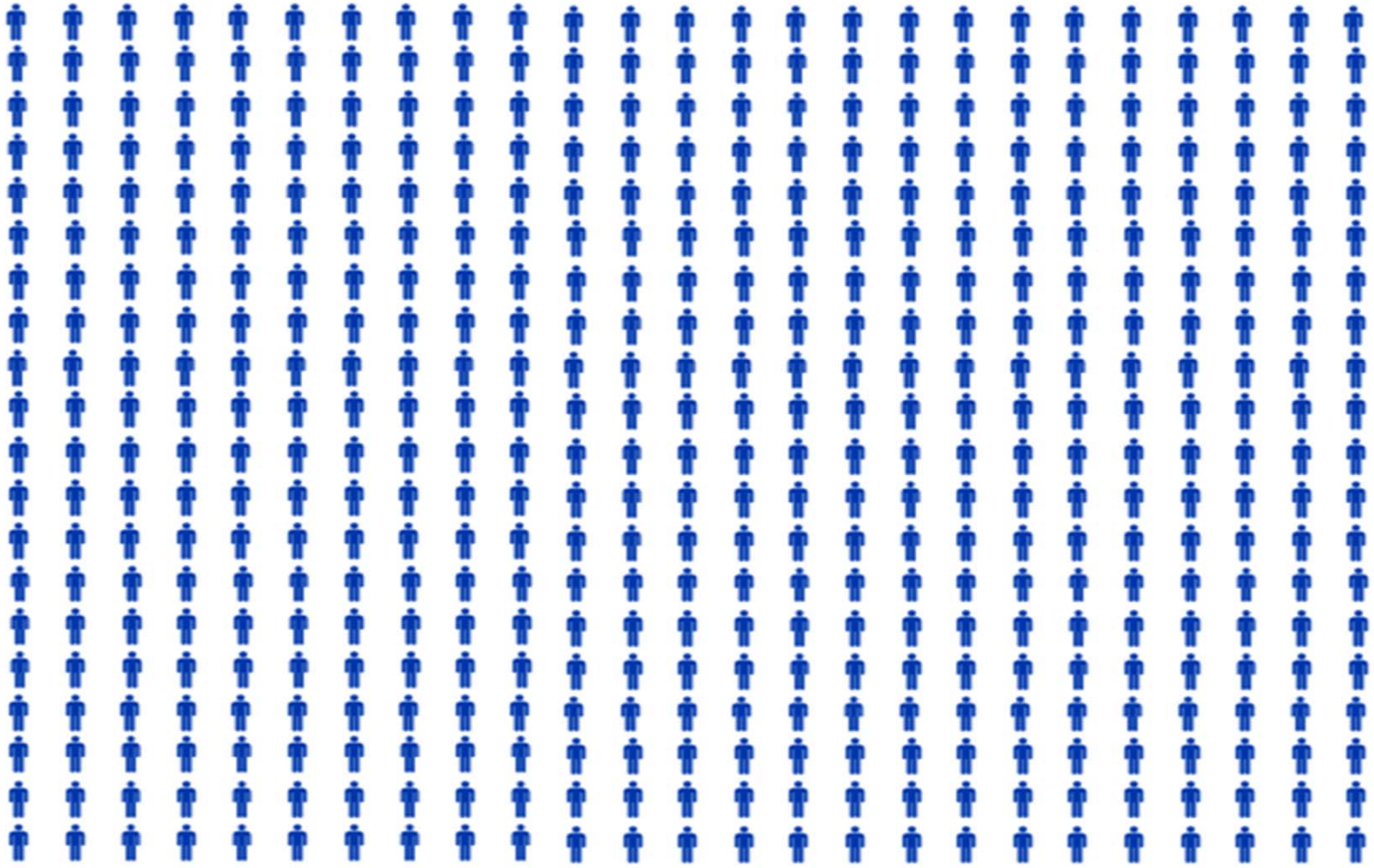
Ratio of Audiologists to General Population:
Developed World



= **1000 people**

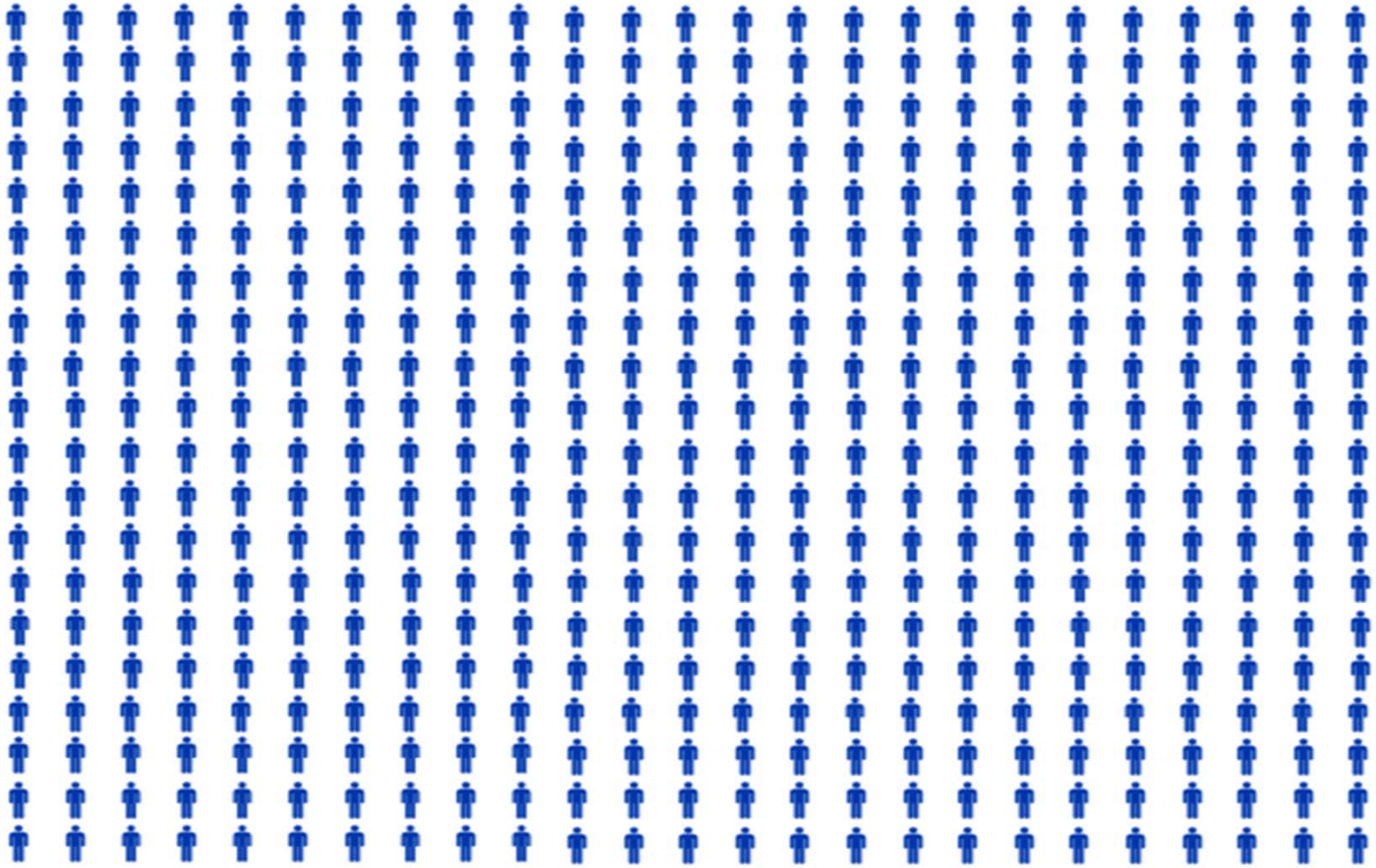
Ratio of Audiologists to General Population: **Developing World**



= 1000 people

Swanepoel et al., 2010

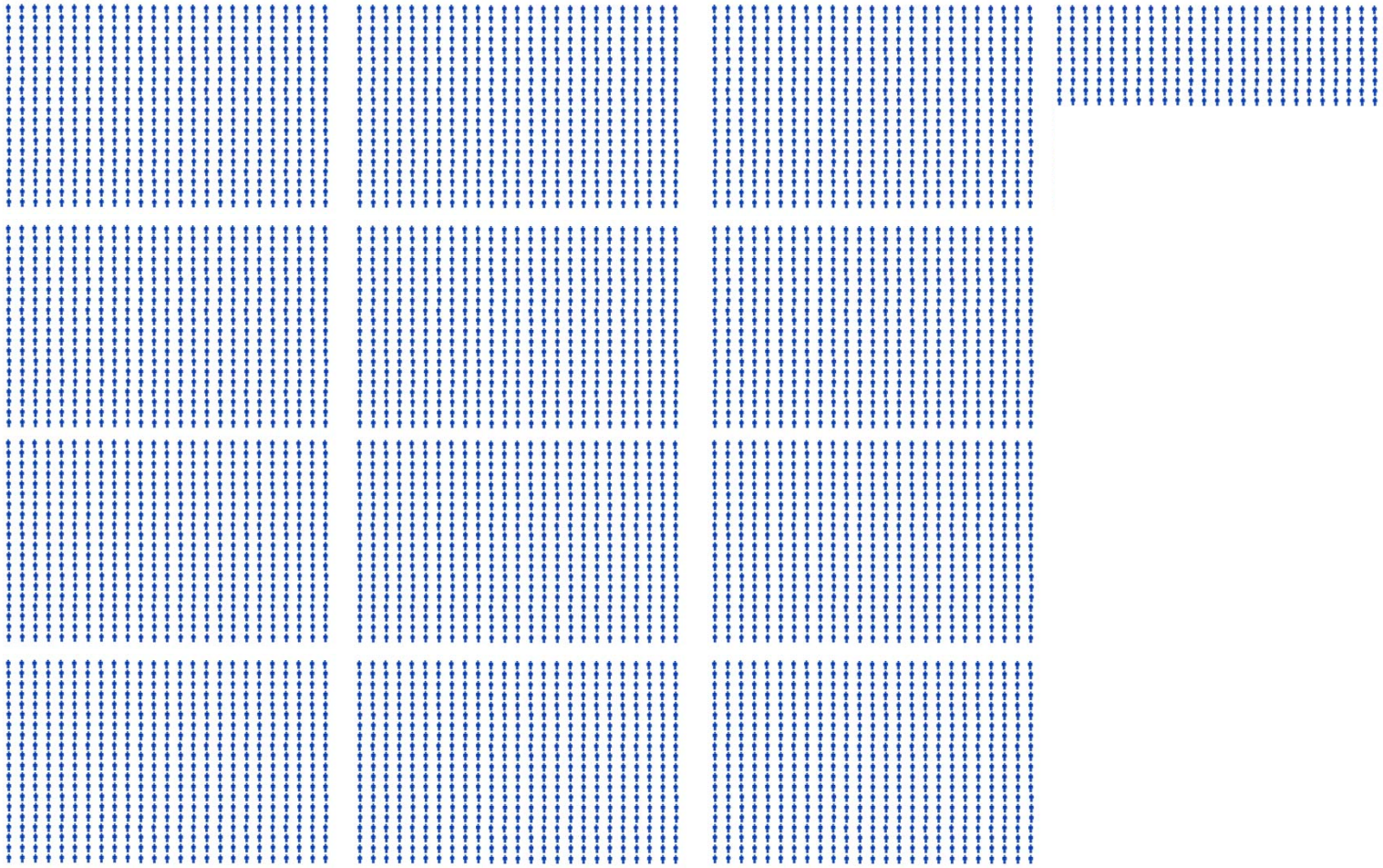
Ratio of Audiologists to General Population: **Developing World (optimistic estimate)**



= **1000 people**

Swanepoel et al., 2010

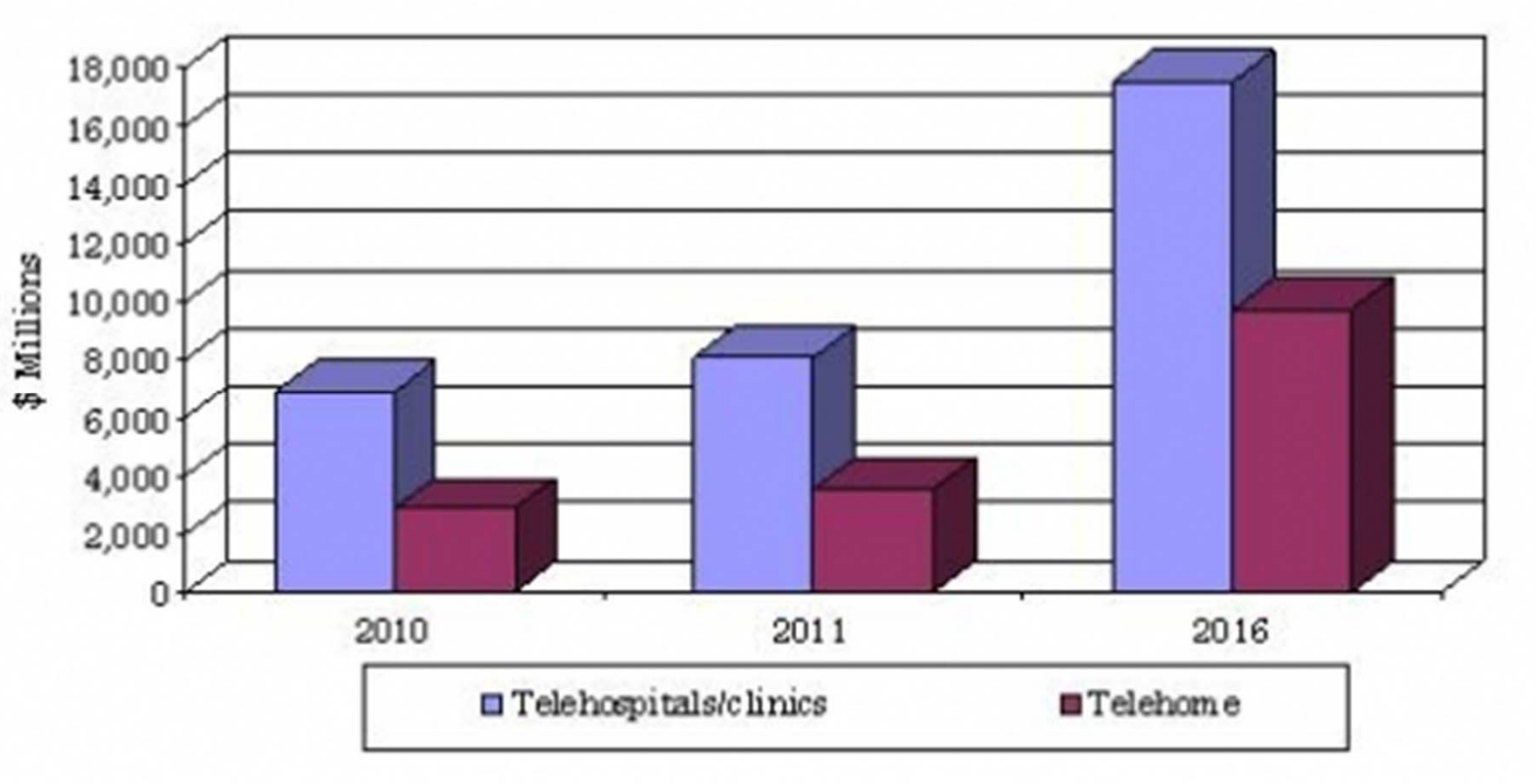
Ratio of Audiologists to General Population:
Developing World (pessimistic estimate)



= **1000 people**

Swanepoel et al., 2010

Global Telemedicine Market: Strong Growth Expected



BCC Research, 2012

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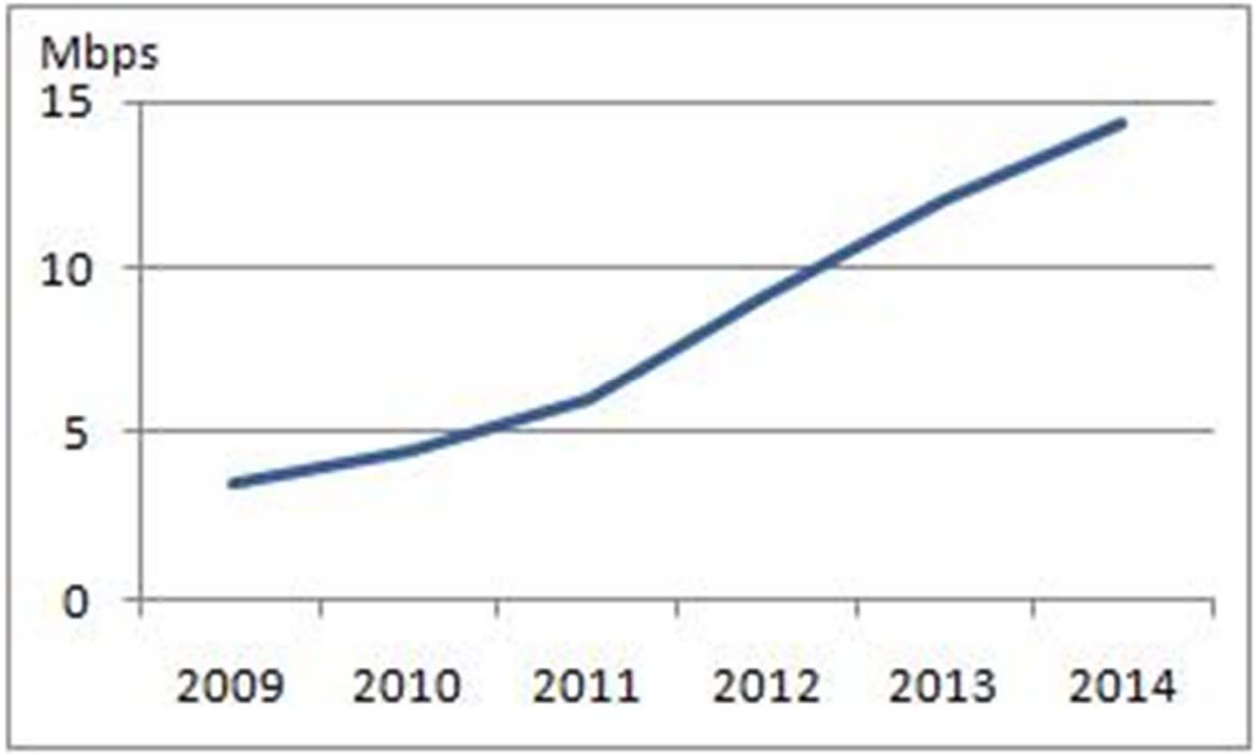
Projected average global residential download speed (Mbps) 2009-2014



Source: Hyperconnectivity and the Approaching Zettabyte Era, June 2, 2010, Cisco

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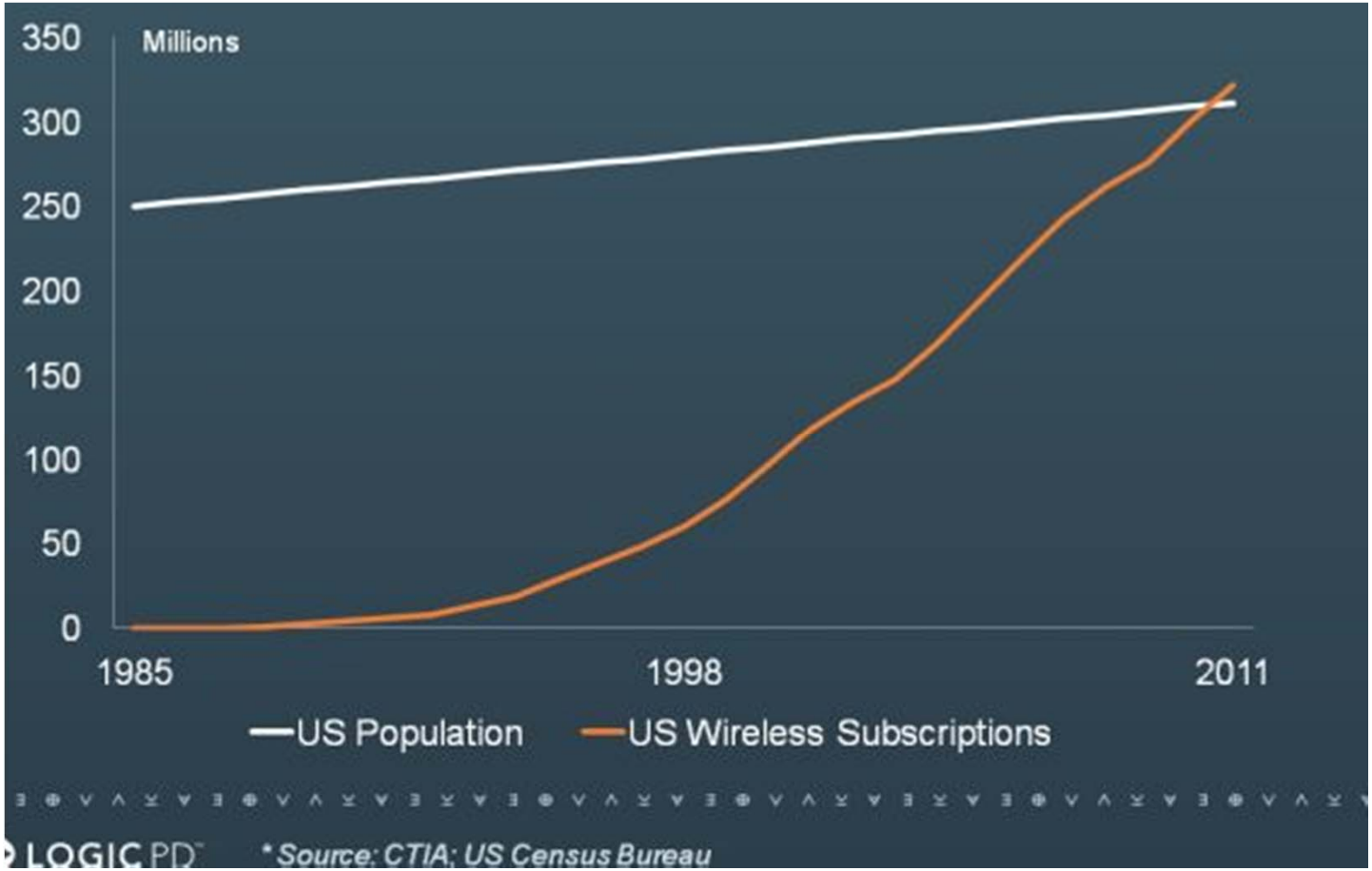
Mobile Proliferation



The number of broadband wireless subscriptions in the US has exceeded the number of people in the US.

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Models of Telehealth Delivery

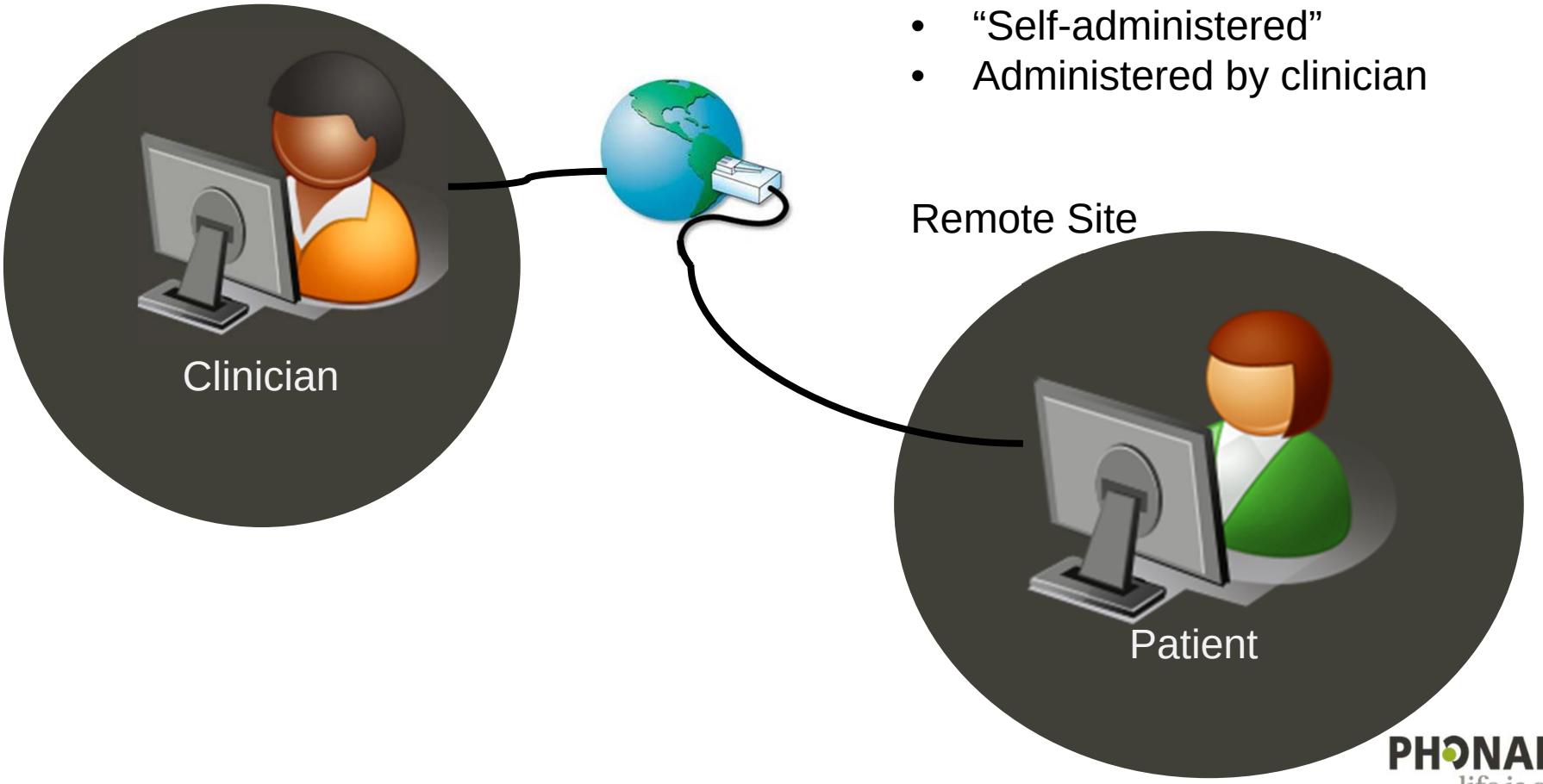
Real Time: Synchronous, interactive, and live:

- Users on both ends are communicating with real-time feedback
  - Telephone
  - Skype

Cloud-based: Asynchronous & off-line:

- Information is stored and reviewed at a later time (also known as “store-and forward”)
  - Answering machine
  - E-mail

Telehealth – Direct connection



- “Self-administered”
- Administered by clinician

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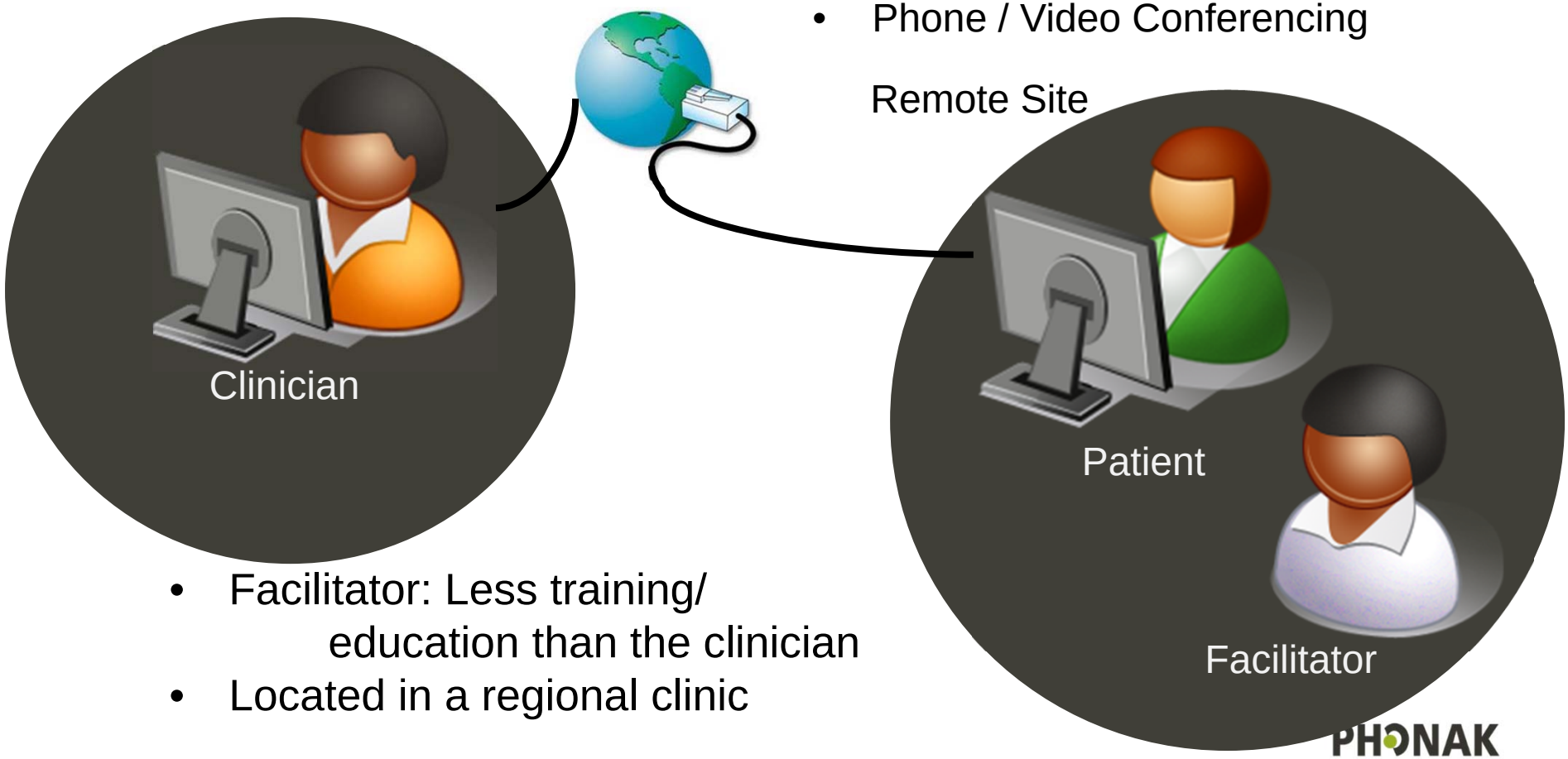
Telehealth – Connection via a facilitator



- Secure Internet Connection
- Phone / Video Conferencing

- Facilitator: Less training/ education than the clinician
- Located in a regional clinic

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Teleaudiology: Swanepoel & Hall (2010). *Telemedicine & e-Health, 16*, 181-200.

Table 2. Summary of Tele-Audiology Reports According to Category, Populations, and Models

CATEGORIES	NO. OF REPORTS	STUDY POPULATIONS	PROCEDURES/TECHNIQUES
Screening	5	Infants, children, and adults	Video-otoscopy, immittance, OAE, AABR, audiometry, speech-in-noise
Diagnosis	12	Children and adults	Video-otoscopy, audiometry (AC and BC), HINT, ABR, intraoperative monitoring, balance testing
Intervention	7	Adults	HA fitting and verification, CI programming, tinnitus therapy, HA counseling
Patient perceptions	2(3[a])	Adult clinic patients, tinnitus patients, cochlear implant mapping patients	Questionnaires

[a]Reports of audiological intervention also including patient perceptions.

AABR, automated auditory brainstem response; ABR, auditory brainstem response; AC, air conduction; BC, bone conduction; CI, cochlear Hearing-in-Noise-Test; OAE, oto-acoustic emissions.

Teleaudiology: General summary of the current literature

- Most studies involved a facilitator with the patient
- Study designs mostly compared the results of face-to-face evaluations and remote evaluations
- Results: Good agreement between face-to-face appointments and teleaudiology appointments
- Caveat: Thus far, few studies per topic

Today’s research: Attitudes toward teleaudiology

Why study attitudes?

Berg (1999) found that 75% of telemedicine interventions ultimately fail.

To understand why, Broens et al. (2007) and Hailey & Crowe (2000) conducted meta-analyses of telemedicine interventions:

- Reliable technological systems that support the intervention
- ***They also found that it is critical to understand attitudes of key stakeholders toward the intervention***

I initially assumed that the attitudes of patients toward teleaudiology mattered most.

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I initially assumed that the attitudes of patients toward teleaudiology mattered most.

Literature suggests NOT

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The broader literature in telemedicine

Acceptance by clinicians is a key factor in determining success with telemedicine interventions

(Al-Qirim, 2007; May, 2006; Wootton & Herbert, 2001).

The practitioner is described as:

"*the most important initial gatekeeper for success with telemedicine interventions*"...

(Whitten & Mackert, 2005)

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Study I

Study I: Qualitative Study

- Interview-based qualitative study exploring attitudes toward teleaudiology
- Potential participants were nominated by a panel of 3 experts, with the goal of inviting hearing health care professionals with varied but relevant work histories
- 60-100 minute long interviews of 11 hearing health care practitioners (data saturation was obtained) were conducted
- Interviews were transcribed and coded by 2 independent coders

Qualitative study: Major themes revealed

A total of 97 codes emerged, clustering into core themes:

- Advantages & disadvantages of teleaudiology

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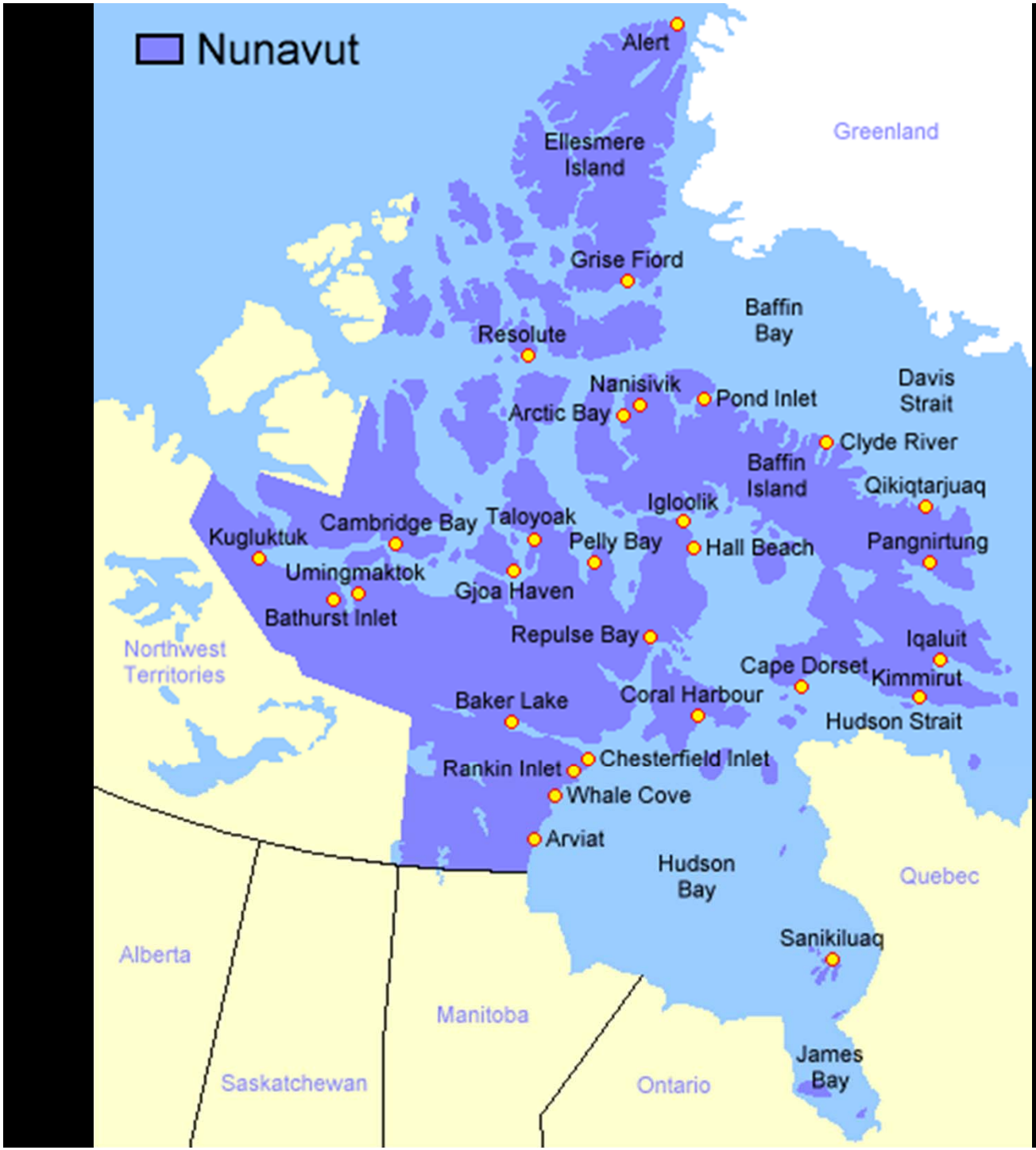
Yukon
Whitehorse
Northwest Territories
Yellowknife
Nunavut
Iqaluit
British Columbia
Victoria
Alberta
Edmonton
Saskatchewan
Regina
Manitoba
Winnipeg
Ontario
Quebec
Newfoundland and Labrador
St. John's
Charlottetown
Prince Edward Island
Fredericton
New Brunswick
Halifax
Nova Scotia
Quebec
Ottawa
Toronto
Lake Ontario
Lake Michigan
Lake Erie



Accessibility

Convenience

Principal disadvantage: Teleaudiology could pose a threat to patient-practitioner relationship quality

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Discomfort...
…it's a gut feeling….
....the in-person experience is richer…

“You almost need to be in [the client’s] presence to understand their body language and eye contact and their tone. I’m not exactly sure what it is. It’s almost an intangible thing to me. In order to feel comfortable with someone and trust them, I would prefer to have built that in person.”

-Audiologist (public setting)
18 years of experience

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Qualitative study: Major themes revealed

Teleaudiology is well-suited for some clinical tasks & patient populations, and not others.

Well-suited	Not well-suited
• Aural Rehab	• Diagnostics
• Follow-up appointments	• New patients
• Issue of accessibility	• Children

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TECHNOLOGY

The learning curve is just too steep for some

Study II

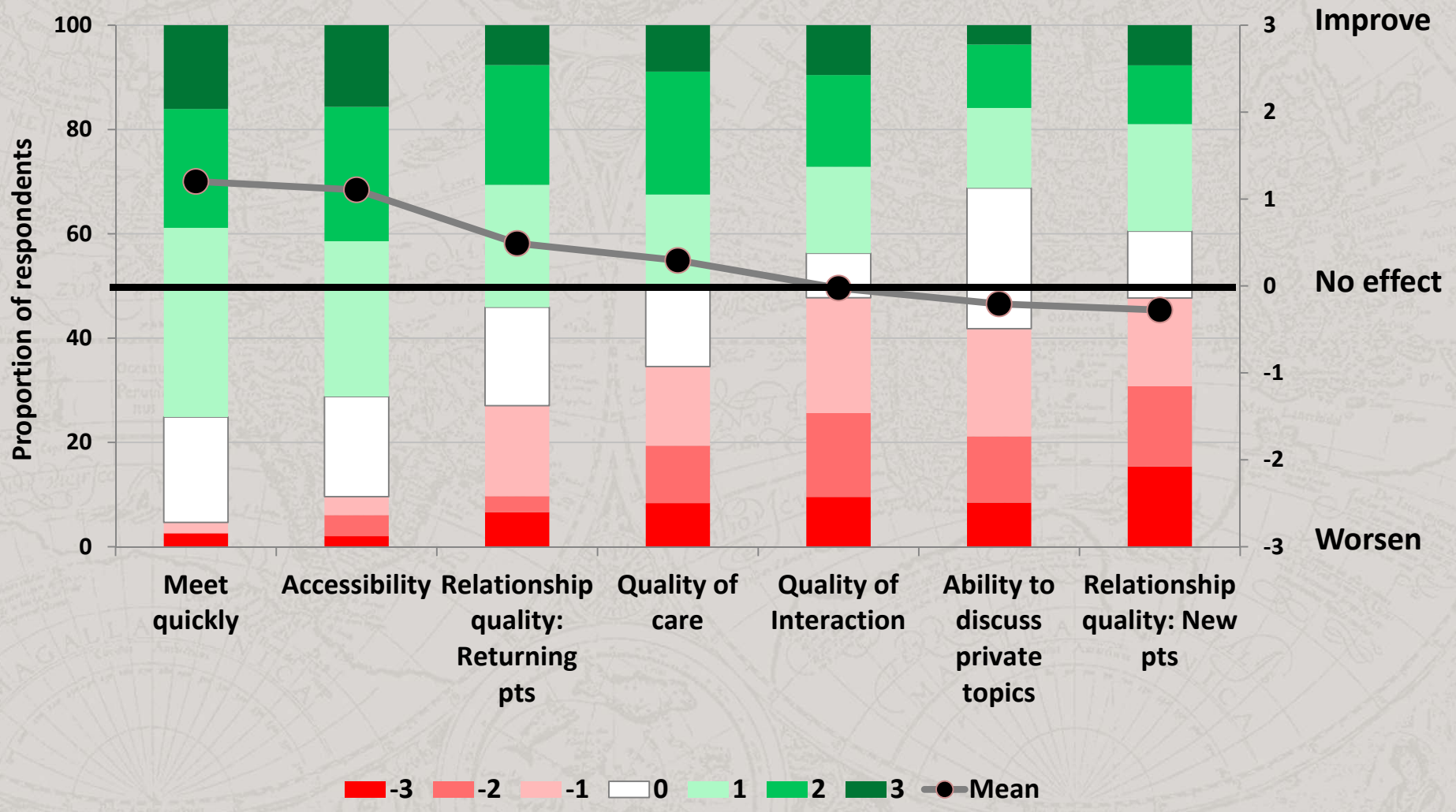
Study 2: Survey of Attitudes

Goal: To survey attitudes toward teleaudiology in a large sample of hearing health care practitioners

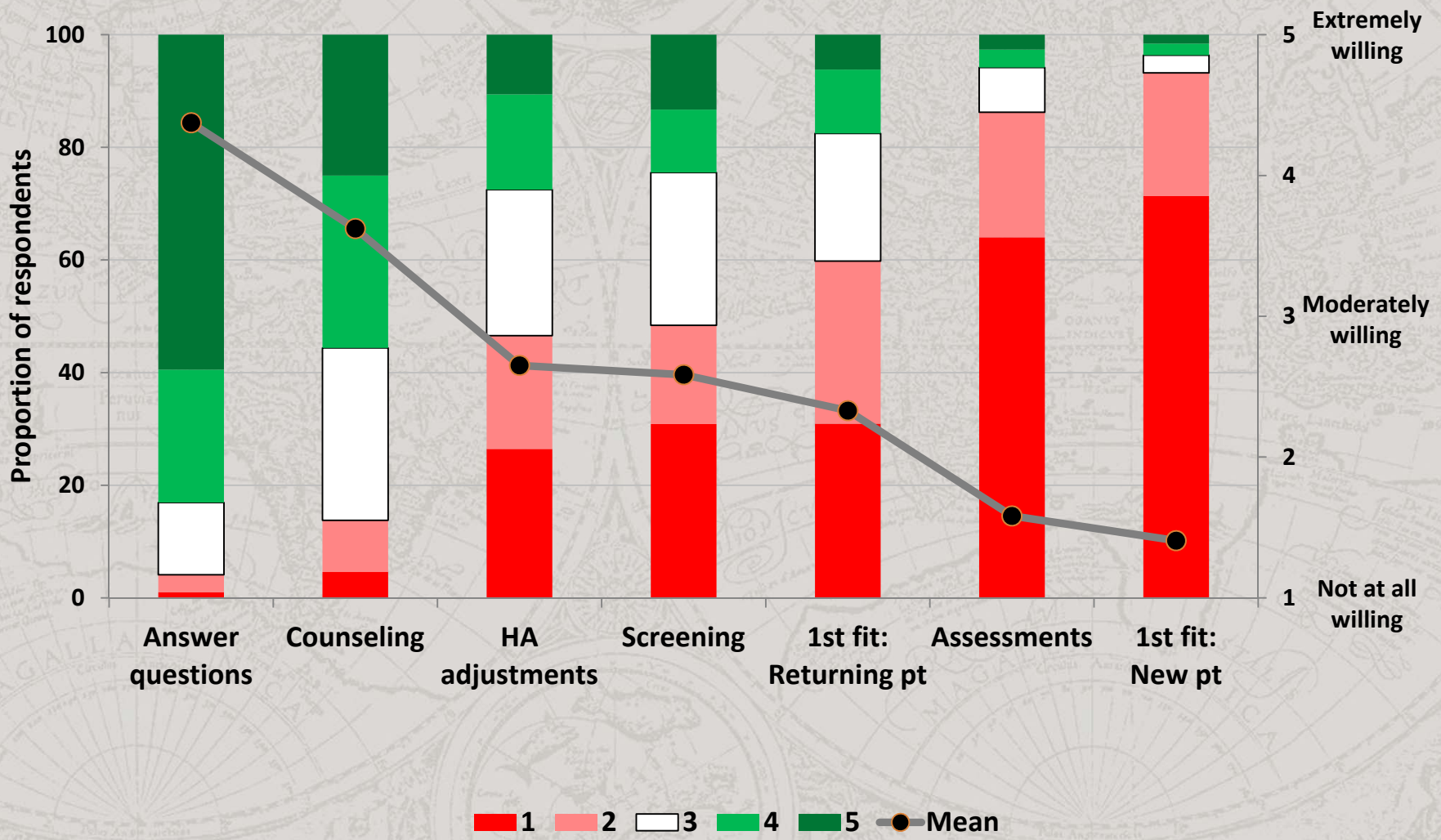
Participants:

- Recruited through electronic mailing lists and postings at conferences
  - 202 practitioners (*M* = 39.3 years age; SD = 11.0)
    - 28: Owned their own clinic(s)
    - 109: Worked in a private practice
    - 53: Worked in a non-profit environment

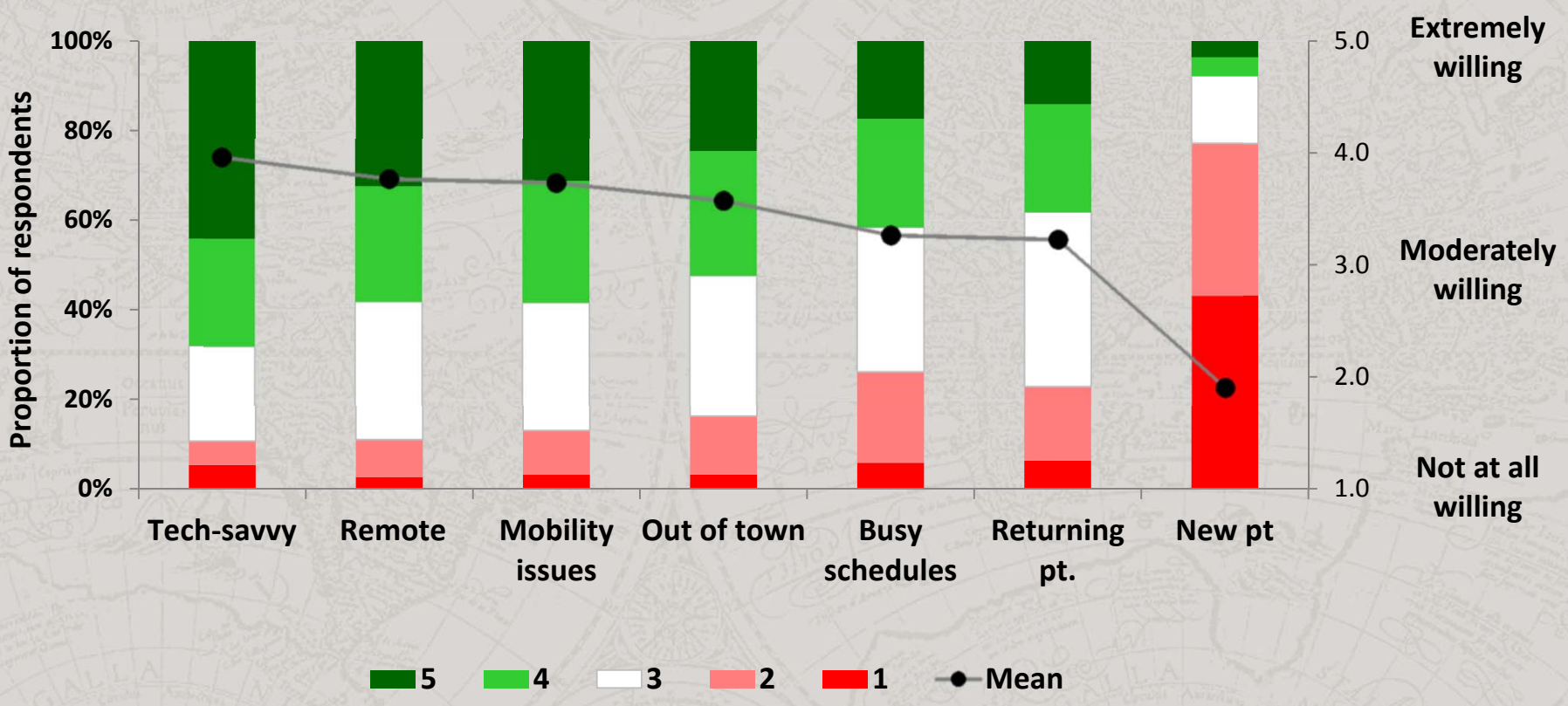
Perceived effect of teleaudiology on hearing health care



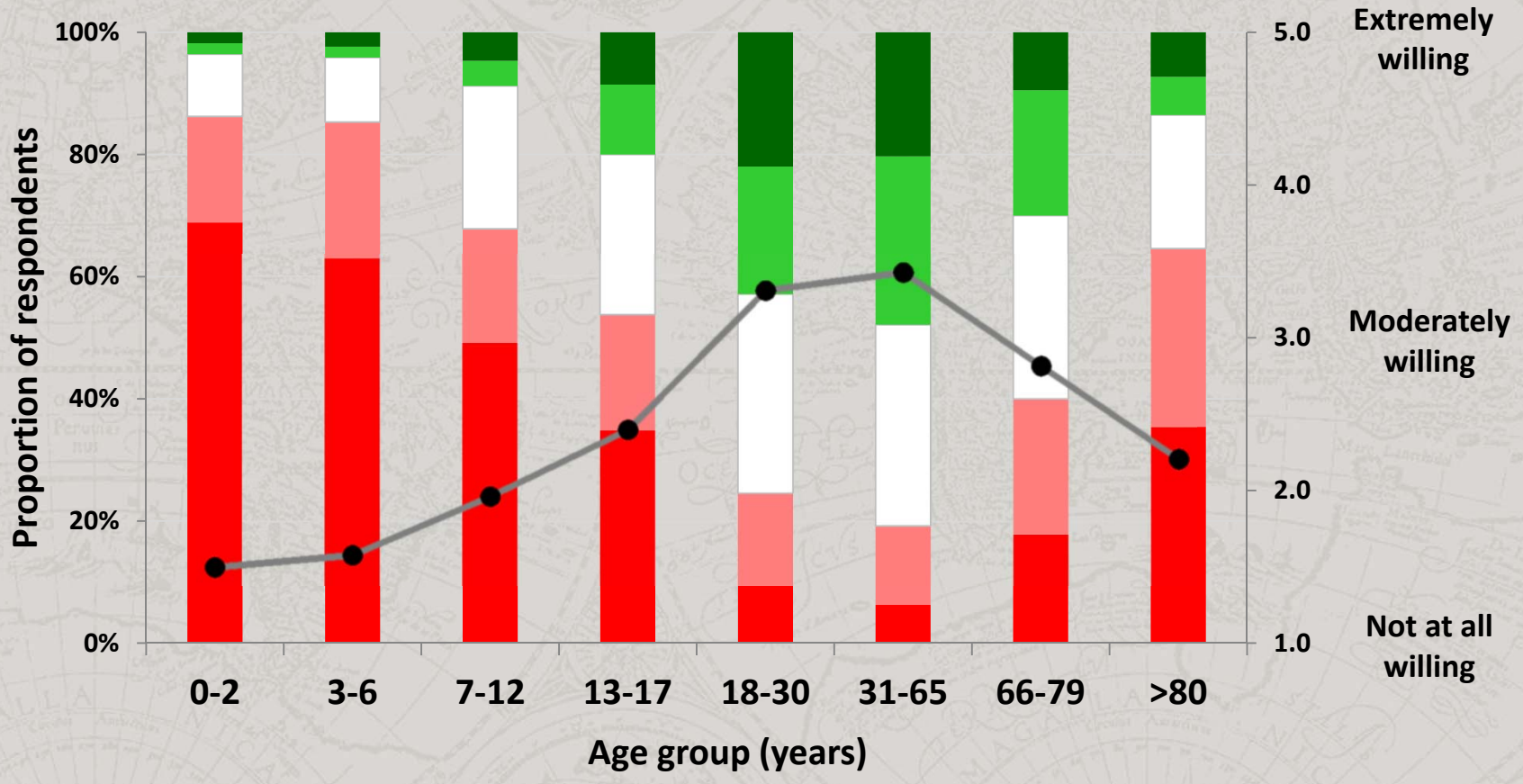
Willingness to use Teleaudiology: Clinical tasks



Willingness to use Teleaudiology: Patient groups



Willingness to use Teleaudiology: Age groups



Study 2: Conclusions

On average, it is believed that teleaudiology will increase accessibility, but will likely have a minimal effect on hearing health care.

However, there are significant proportions of clinicians who have opposing attitudes toward teleaudiology.

Willingness to conduct teleaudiology appointments is highly dependent on the clinical task to be performed and the patient group receiving service.

Why are there such fervent beliefs for and against the use of teleaudiology in hearing health care?

In part, practitioners may be adopting different frames of reference regarding:

- Clinical tasks to be performed
- Patient populations being served

Study III

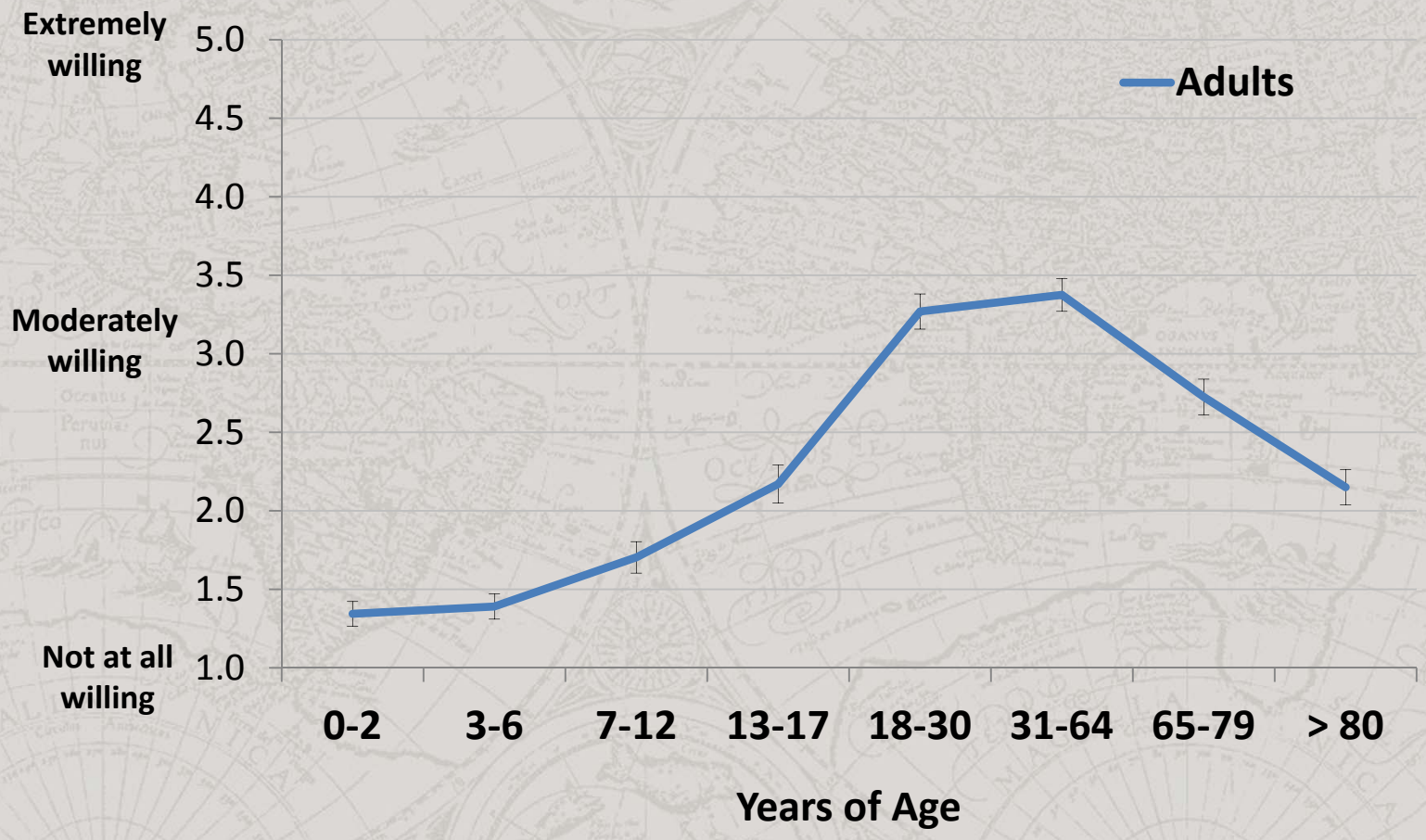
Study 3: Pediatric vs. Non-pediatric Practitioners

Goal: To better understand the observed reluctance of using teleaudiology with pediatric populations

Original sample: Only 15 of the 202 participants indicated that pediatrics comprised their primary clientele

Collected data on 30 additional practitioners who indicated that pediatrics comprise their primary clientele

Pediatric vs. Non-pediatric Practitioners Willingness to use teleaudiology: Age groups



Pediatric vs. Non-pediatric Practitioners Willingness to use teleaudiology: Age groups

Study 3: Interpretation

Reluctance of practitioners to conduct teleaudiology appointments with pediatric populations may be due to a practitioner's familiarity conducting audiology appointments with children.

What are the attitudes of patients toward teleaudiology?

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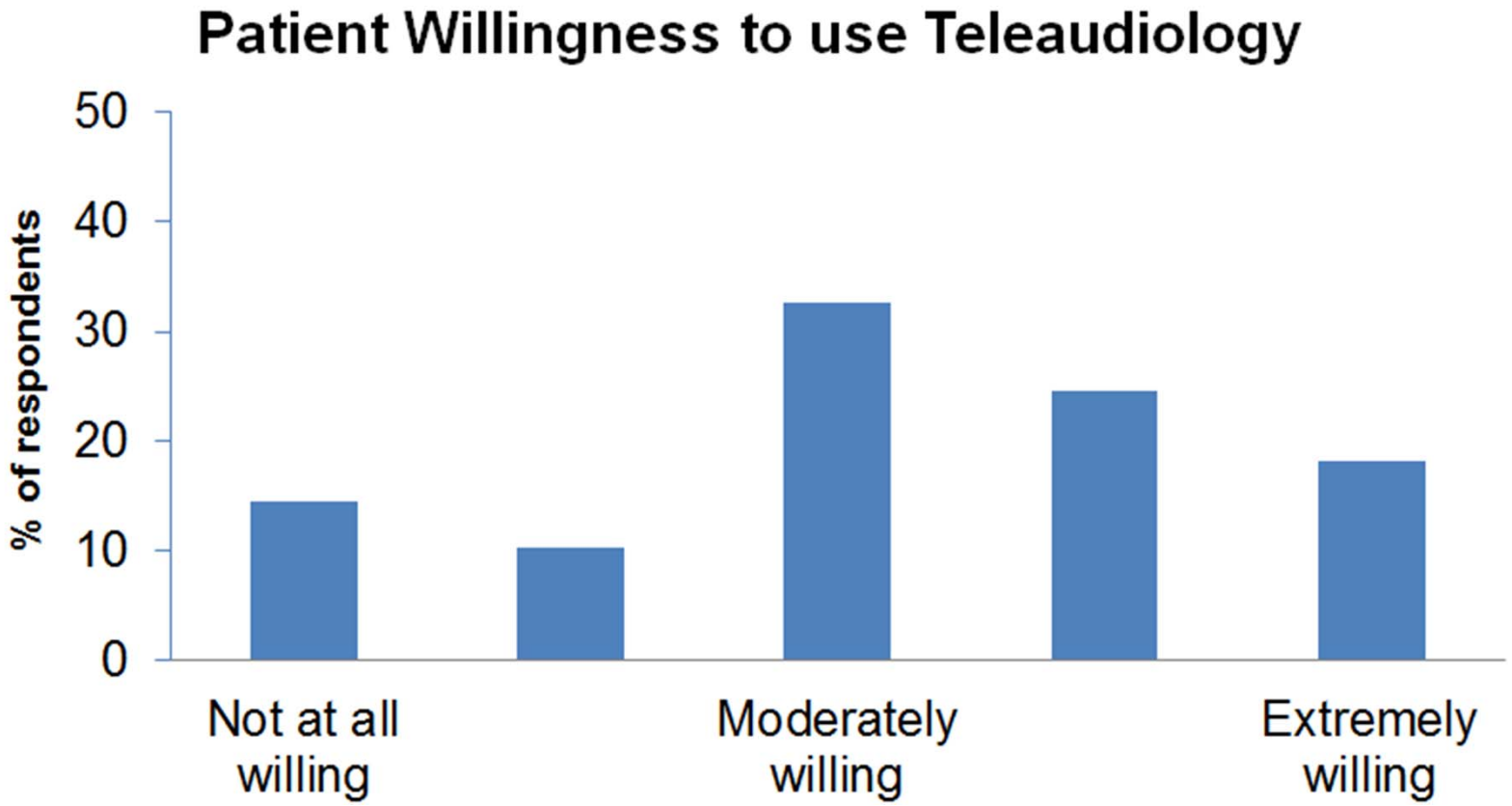
Patient attitudes toward teleaudiology

- Questionnaire design
- Postings at 50+ audiology clinics (electronic or paper copies)

224 respondents

- All had experienced at least one audiology appointment
- 129 males; 95 females
- Mean age = 67.1 years (*SD* = 15.3)

Patient attitudes toward teleaudiology



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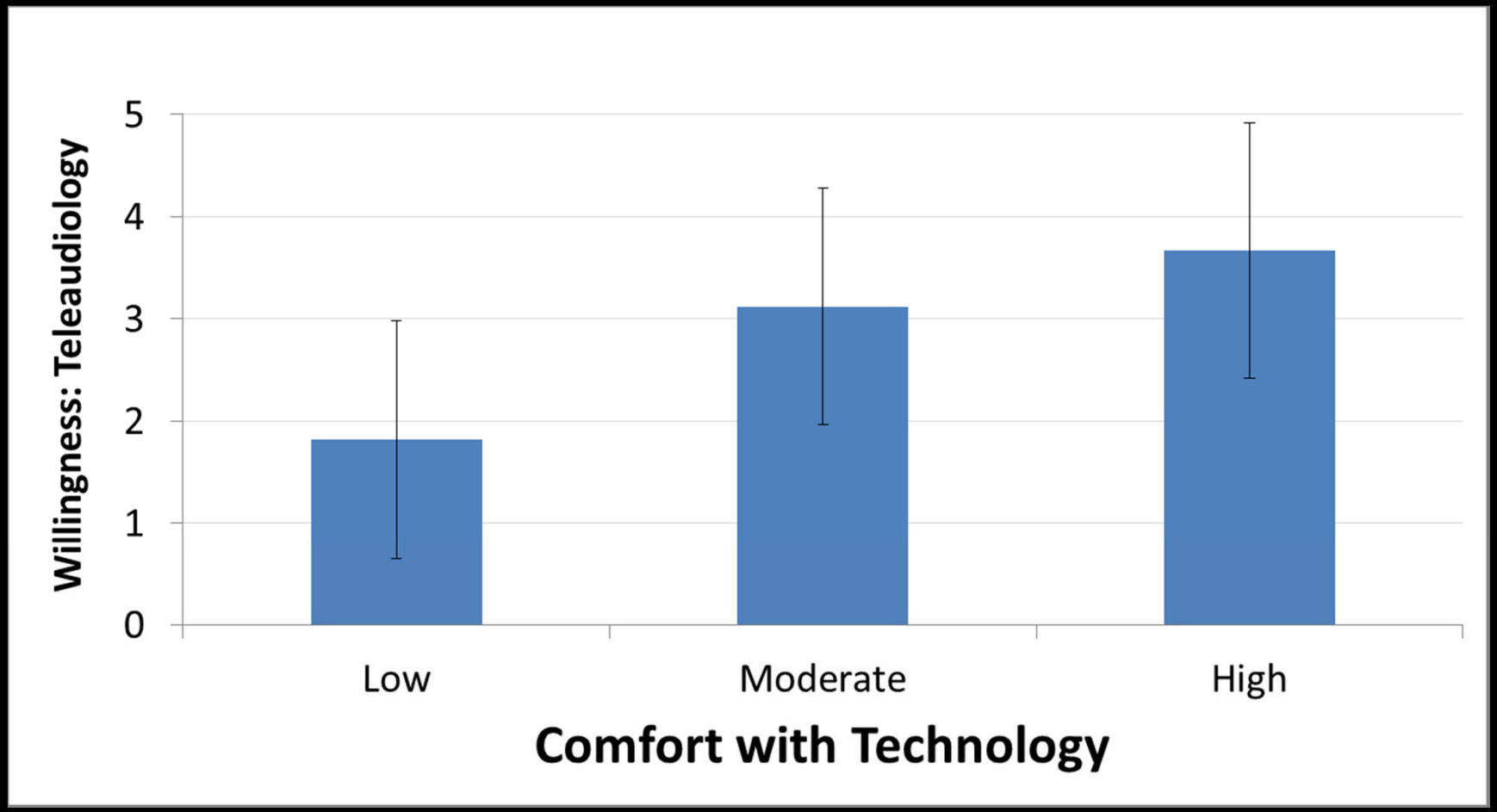
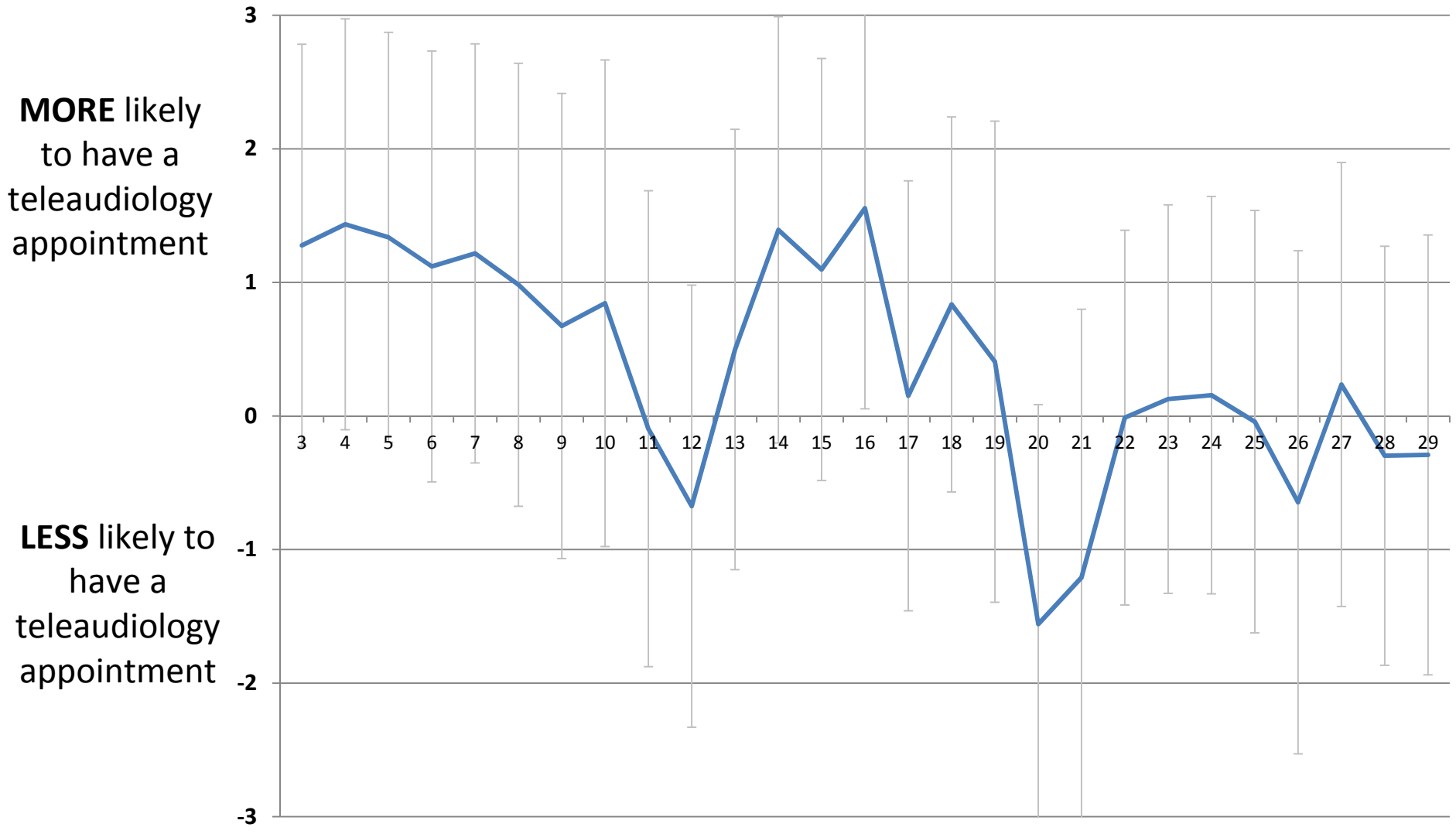
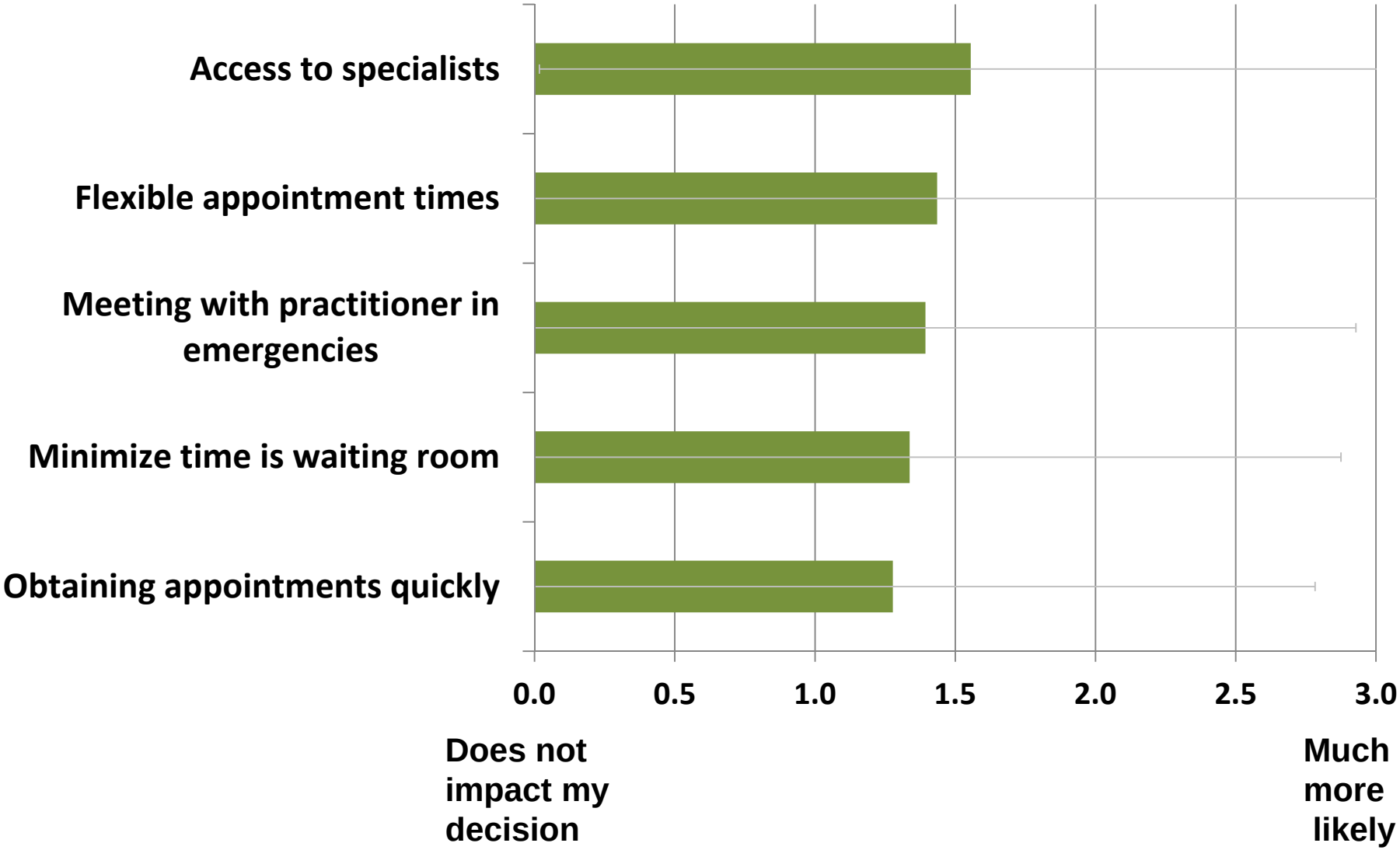
Willingness to have a teleaudiology appointment: Comfort with technology



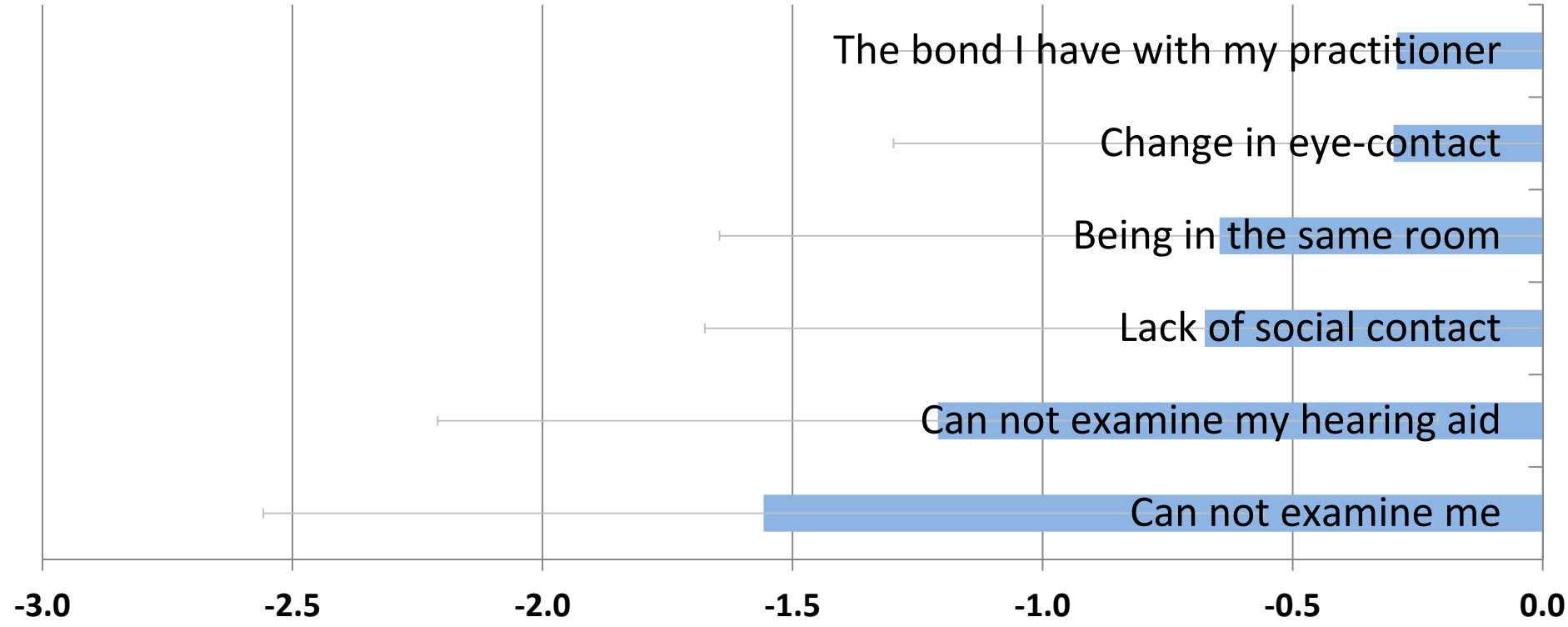
Examined 27 factors that might contribute to willingness to conduct teleaudiology appointments



Factors MOST LIKELY to motivate a teleaudiology appointment



Factors LEAST LIKELY to motivate a teleaudiology appointment



Study IV

Study 4

Goal: To better understand how attitudes shift before and after experiencing a remote follow-up fine-tuning of hearing instruments (first fit was a face-to-face appointment)

Sample: 8 audiologists and 16 patients (Germany)

- 4 fine-tuning issues
- 4 handling issues

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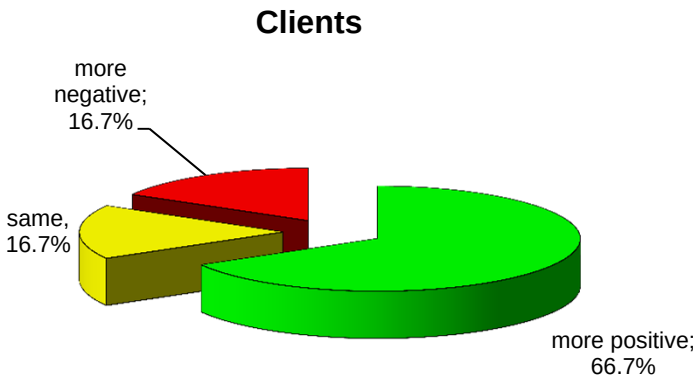
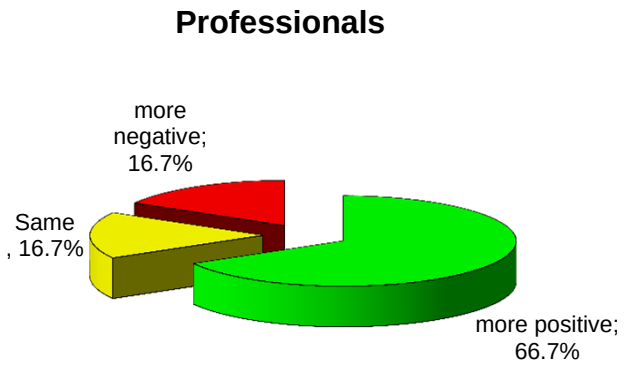
How did the attitudes shift before and after using the teleaudiology technology?





The future of teleaudiology?


US Secretary of Veterans Affairs, Eric Shinseki

Public and Intergovernmental Affairs

VA Announces 2011 Industry Innovation Competition

February 15, 2011

Printable Version
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VA Announces 2011 Industry Innovation Competition

$100 Million for Innovations to Improve Health Care Quality for Veterans

WASHINGTON – The Department of Veterans Affairs (VA) today announced the opening of the 2011 Industry Innovation Competition to identify, fund and evaluate promising innovative technology proposals to improve the quality of health care for Veterans.

"VA has a long history of being an innovator and early adopter of health technology," said Secretary of Veterans Affairs Eric K. Shinseki. "This competition continues that legacy and provides VA with a powerful tool to utilize the best and brightest within the industry to improve care and services for our Nation's Veterans, their families and survivors."

This competition is part of VA's Innovation Initiative (VAi2), a department-wide program that solicits the most promising innovations from employees, the private sector, non-profits, and academia to increase Veterans' access to VA services, improve the quality of services delivered, enhance the performance of VA operations, and reduce or control the cost of delivering those services. Up to $100 million in awards could be made in this innovation competition.

"VAi2 offers a unique opportunity to tap the talent and innovative power of the private sector," said Jonah Czerwinski, Senior Advisor to the Secretary and Director of VAi2. "The 2011 Industry Innovation Competition builds on the momentum established in 2010 by challenging industry and academia in five new areas."

Public and private companies, entrepreneurs, universities and non-profits are encouraged to propose new ways to:

- Leverage telemedicine solutions to provide audiology services to Veterans who live far from medical centers
- Create and implement enhancements or novel uses of VA's "Blue Button" personal health record

This research was made possible because of the contributions of:

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Thank you!


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