Developing countries, developing hearing health

Professor Bradley McPherson
Centre for Communication Disorders
The University of Hong Kong
Global perspective

“The health industry focuses on people with the greatest ability to pay rather than the greatest need for care”

P. Baxandall, *Dollars and Sense*, 2001
The world as it is
The world as it is

...in terms of population
The world as it is

...in terms of infant mortality
The world as it is

...in terms of government spending on health care
Global burden of hearing loss

- WHO's recent estimate (2013) is that 360 million people in the world have disabling hearing impairment
- Two-thirds of these people live in developing countries
- 10% of all people with disabling hearing impairment are children
Global burden of hearing loss

FIG. 1 Comparison of hearing loss prevalence in children with gross national income, WHO, 2011 estimates
Global burden of hearing loss

“The health industry focuses on people with the greatest ability to pay rather than the greatest need for care”

- This is also true for **hearing health care**
- Less than 2.5% of the potential market in developing countries is now supplied with hearing aids
Global burden of hearing loss

- Less than 10% of children in developing countries have access to any early intervention
- Less than 2.5% have hearing aids
- How to improve this situation?
Global burden of hearing loss

- Three main barriers to access to hearing aids:
  - Cost
  - Skilled hearing health workers
  - Public awareness
Barriers to access: costs of hearing aids

government spending on health care
Barriers to access: costs of hearing aids

- Most African nations have smaller GDP than many large (and not-so-large) corporations
Barriers to access: costs of hearing aids
Barriers to access: costs of hearing aids

- in the 49 least-developed countries, per capita income is $US760 or less
- average cost of hearing aids is $200-$500 in developing countries
- annual cost of hearing aid batteries $36
- 32 million hearing aids needed in DCs each year – only 750,000 distributed
### GDP and target hearing aid cost*

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP &amp; Hearing Aid Cost</th>
<th>Target Hearing Aid Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>$51,704</td>
<td>$1,550</td>
</tr>
<tr>
<td>Switzerland</td>
<td>$44,864</td>
<td>$1,350</td>
</tr>
<tr>
<td>South Korea</td>
<td>$31,950</td>
<td>$950</td>
</tr>
<tr>
<td>Brazil</td>
<td>$11,747</td>
<td>$350</td>
</tr>
<tr>
<td>China</td>
<td>$9,055</td>
<td>$270</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>$6,046</td>
<td>$180</td>
</tr>
<tr>
<td>Vietnam</td>
<td>$3,788</td>
<td>$115</td>
</tr>
<tr>
<td>Uganda</td>
<td>$1,424</td>
<td>$45</td>
</tr>
</tbody>
</table>

*3% of GDP
Barriers to access: lack of trained personnel

Number of ENT specialists per million population

- Low income:
  - ENT specialists/million <=1: 14
  - ENT specialists/million >=1: 6

- Lower-middle income:
  - ENT specialists/million <=1: 5
  - ENT specialists/million >=1: 18

- Upper-middle income:
  - ENT specialists/million <=1: 1
  - ENT specialists/million >=1: 12

- High income:
  - ENT specialists/million <=1: 0
  - ENT specialists/million >=1: 12

Countries:
N = 68
Barriers to access: lack of trained personnel

Number of audiologists per million population

- Audiologists/million <= 1
- Audiologists/million >= 1

Countries
N = 57

- Low income
- Lower-middle income
- Upper-middle income
- High income
Barriers to access: lack of trained personnel

Number of speech therapists per million population

- Low income
- Lower-middle income
- Upper-middle income
- High income

Countries
N = 56
Barriers to access: lack of trained personnel
Barriers to access: limited public awareness

Countries with a national committee for hearing health care

![Bar chart showing countries with national committees for hearing health care by income level.](chart_image)
World Health Organization initiatives

- WHO campaign to “find ways to enable the provision of affordable, appropriate hearing aids and the services to fit them”

- Based on the 1995 World Health Assembly resolution to “promote and support … the optimal prevention and treatment of major causes of hearing impairment”
World Health Organization initiatives

- Campaign includes *Guidelines* (2004) on appropriate minimum requirements for hearing aids, earmoulds and delivery services in developing countries
World Health Organization initiatives

- *Guidelines (2004)* have been translated into a number of languages, including Chinese.
Community-based hearing health

1. Basic level
2. Intermediate level trainer manual
3. Intermediate level student workbook
4. Advanced level
Community-based hearing health

- Work in this area gives very basic support to children and families in poor communities
- Suggests practical ways to include ear and hearing health care in community programs
Community-based hearing health

- Better Hearing Philippines
- Over a five year period trained more than 3,000 rural health workers in basic hearing health care
- Organized affordable hearing aid fitting in underprivileged communities
- Developed a publicity campaign aimed at raising awareness of hearing disability and ways to reduce disability
Community-based hearing health

- China Rehabilitation Research Center for Deaf Children
- Center for research excellence in China
- Conducts research into all aspects of hearing loss in children
- Actively involved as an international partner with WHO and WWHearing
Community-based hearing health

- Recent CRRCDC work with WWHearing
- An example of health systems research and development
Community-based hearing health

- Involved training teachers to assess children for hearing loss and fit hearing aids
- Guangxi Province, China
Community-based hearing health

- 400 children with hearing loss were fitted with free hearing aids
- Fitting outcomes were carefully followed and the economic costs of fitting in different clinics calculated
Community-based hearing health

- Health care cost per child $US760 at primary care level
- $US940 at secondary care level
- $US1,120 at tertiary care level
- First work to provide clear data on costs and outcomes of fitting children with hearing aids in a developing nation
Community-based hearing health

- Mobile ear care services in Ghana, Namibia and Nigeria
- Allow rural children access to professionals
- Assessment and hearing aid fitting services
Affordable hearing aids
Affordable hearing aids

- Hearing aid purchase consortiums enable members to buy hearing aids in bulk
- Large price discounts for the organisations involved
- Consortiums purchase reliable, well known hearing aid models that are coming to the end of their sales life in developed countries
- Alternative strategy is to purchase from local manufacturers, e.g., China and India
Affordable hearing aids

- International Humanitarian Hearing Aid Purchasing Program (IHHAPP)
- Based in USA
- Low cost digital hearing aids with feedback and noise management
- 3 models currently available
Affordable hearing aids

- Many features of digital hearing aids helpful in developing countries, for example in noisy schools:
  - Wide dynamic range compression
  - Noise reduction algorithms
  - Directional microphones
Affordable hearing aids

• WHO *Hearing Aid Technology Preferred Product Profile*
• PPP now at final stage of development
• Lists the *essential* design features an affordable digital hearing aid needs
• Intended to be a way of stimulating the hearing aid industry to produce products that meet market needs in developing countries
Affordable hearing aids

- PPP also lists *desirable* design features for affordable digital hearing aids
  - Nanotechnology for dust and water resistance
  - Trainable hearing aids
  - Hearing aids with preset prescription settings

- Other technology may help reduce costs
  - Tele-audiology
  - Instant earmold fitting systems
Affordable hearing aids

Preset programs for common audiogram types
Affordable hearing aids

5 main audiogram configurations for 231 Hong Kong children attending schools for the deaf
Affordable hearing aids

- In many regions hearing aid batteries are expensive and difficult to find
- Rechargeable batteries
- Solar battery chargers
Promoting public awareness

• China’s National Ear Care Day an example of public awareness raising

• National committees in increasing number of developing countries
Clinical implications

• Now more interest being shown in **hearing aid fitting programs** for persons living in developing countries

• More movement of **audiologists and other hearing care professionals** between developed and developing countries, and between developing countries, to share resources and knowledge
Clinical implications

• Now more hearing health **systems research** and hearing health **technology research** to create affordable fitting solutions for children and adults with hearing loss in developing countries

• Solutions for developing countries may have a place in **developed economies** also
Thank you
Coming Next...

Session VI: Creating new opportunities for children with hearing loss
Moderator: Suzanne Purdy

13:15 Introduction to session
13:20 Telepractice in pediatric audiology: expanding audiology horizons for children with hearing loss
De Wet Swanepoel (University of Pretoria, South Africa)
13:50 Developing countries, developing hearing health
Bradley McPherson (University of Hong Kong, China)
14:20 Training professionals in developing countries
Ned Carter (All Ears Cambodia, Cambodia)
14:50 Clinical Case Studies (Panel)
15:40 Closing Address
16:00 End of Conference
Suzanne Purdy and Bradley McPherson (Chairpersons)
Training School

2 years, full-time

- Audiology
- Primary Ear Care

Cost-effective mid-level clinicians
Evidence Services

Selected, reliable information for health and social care in one place
Cambodia

Under 15: 41%

China

Under 15: 26%

World Bank. 2000
Children on the border

Children make up a large portion of the refugees who live in camps along the Thailand-Kampuchea border.

Many of the 300,000 refugee residents are under 12. At least a quarter of the border people are under five years old.

The United Nations High Commission for Refugees, which are represented in this special Laotian group with these representatives: "There are children and many children because about one million and a half of total refugees, and now we have about 80,000 children," said an official of the UNHCR, the UN's refugee agency.

It seems as if many of the children born between 1973 and 1976 died - or perhaps were never born.

Between mid-1975 and the end of 1979, when the communist Khmer Rouge was at its peak, hundreds of thousands of Vietnamese, Chinese, and Cambodian refugees were forced to flee their homes.

The Vietnamese and Chinese have joined forces, and thousands of thousands more were arrested. In 1979, Vietnamese troops invaded and pushed the Khmer Rouge back into the jungle.

But the battle is far from over. The Vietnamese occupation of Kampuchea has led to bloody fighting, and hundreds of thousands more have been forced to flee. In 1979, Vietnamese soldiers invaded and pushed the Khmer Rouge back into the jungle.

Meanwhile, the people in the camps are subject to the Khmer Rouge's brutal rule. Life in the camps is bleak, with a constant threat of violence.

Photos by Marcus Hakevi
Text by Paul Quinn-Judge
~80% live rurally
where no-one works
Rethinking Skill Mix
Task Shifting

“I see task shifting as the vanguard for the renaissance of primary health care”

Dr Margaret Chan, 2008
WHO Director General
Systematic reviews

Quality of care provided by mid-level health workers: systematic review and meta-analysis
Zohra S Lassi,*, Giorgio Cometto,‡ Luis Huicho§ & Zulfiqar A Bhutta*
Governments to determine the appropriate health workforce skill mix

... for an immediate, massive scale-up of community and mid-level health workers

(Kampala declaration 2008)
Key Resources


Grobler et al. 2009. Interventions for increasing the proportion of health professionals practising in rural and other underserved areas. http://dx.doi.org/10.1002/14651858.CD005314.pub2

Lassi et al. 2008. Quality of care provided by mid-level health workers: systematic review and meta-analysis. www.bmj.com/content/344/bmj.e615

Baltussen and Smith. 2012. Cost effectiveness of strategies to combat vision and hearing loss in sub-Saharan Africa and South East Asia: mathematical modelling study. www.bmj.com/content/344/bmj.e615
