

Reality Audiology: - Insights from the pediatric real world



Stacey Rich, MCI Aud



dancing
with the
stars

THE
VOICE

AMISH
MAFIA

American
Idol

THE
X
FACTOR

OUTLAST
WVOR
LAY

Real
Housewives

SHARK
TANK

here comes
Honey
Boo Boo

STORAGE WARS

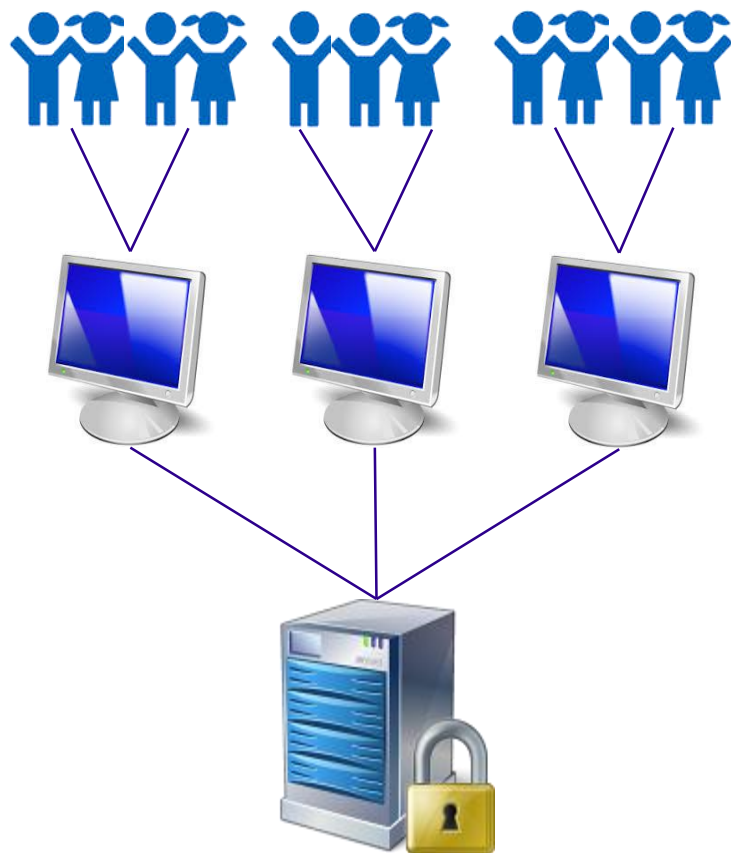
Keeping up
with
the
Kardashians



BASKETBALL
WIVES

THE AMAZING
RACE

How can we see the realities of clinical choices and real life use cases?



Use logs are collected on HI



HI use logs are read into clinician software and stored with fitting logs

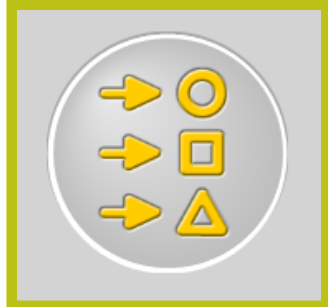


Participating clinics send anonymized software logs to a central repository for retrieval and analysis

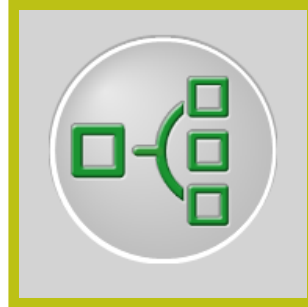
Cuper: Objective Insights into Fitting and Use



Wearers



Usage



Features

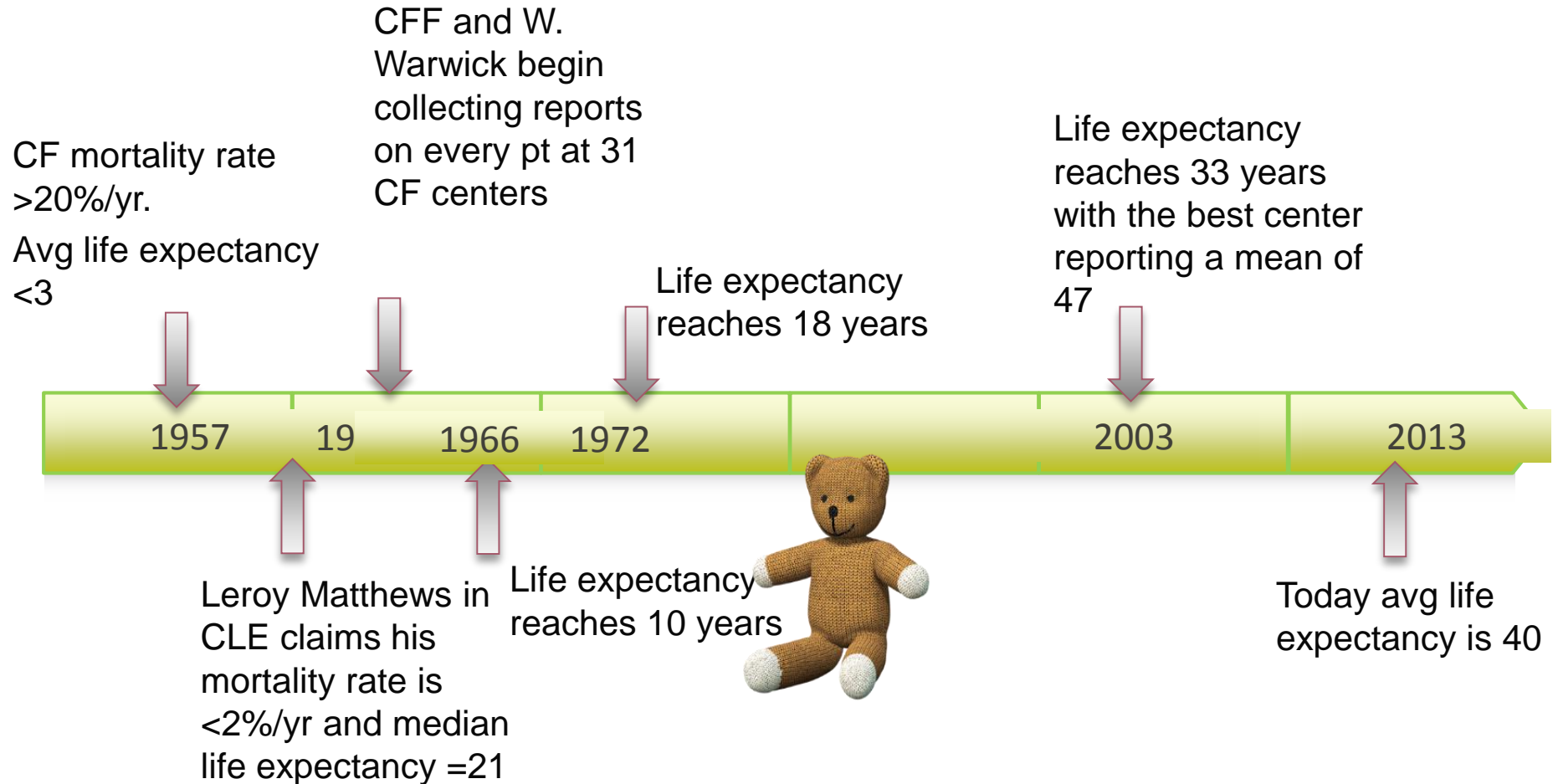


Process



Impact

Cystic fibrosis: a case study of getting better

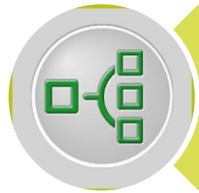


Agenda for today

- ***What can Cuper help us to understand about:***



Pediatric HI users



Pediatric HI fittings



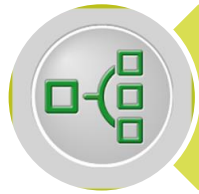
Pediatric HI use



Pediatric hearing care- opportunities
and markers of success



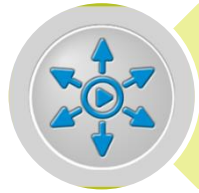
Pediatric HI users



Pediatric HI fittings



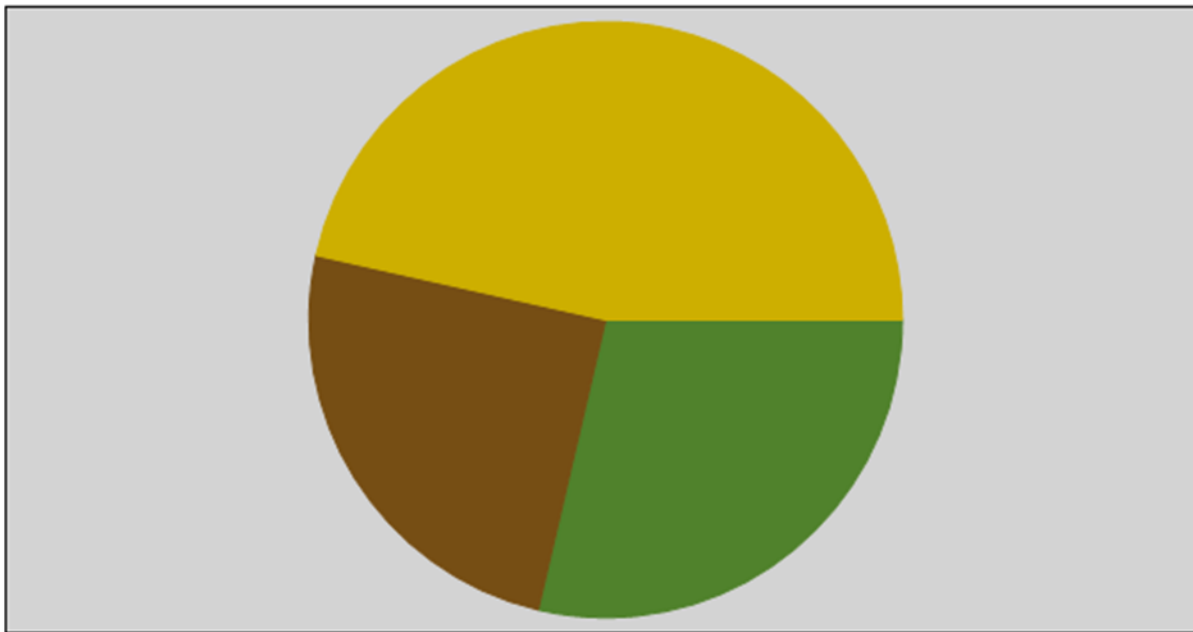
Pediatric HI use



Pediatric hearing care- opportunities
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Fittings by age

Distribution of Fittings by Age Group

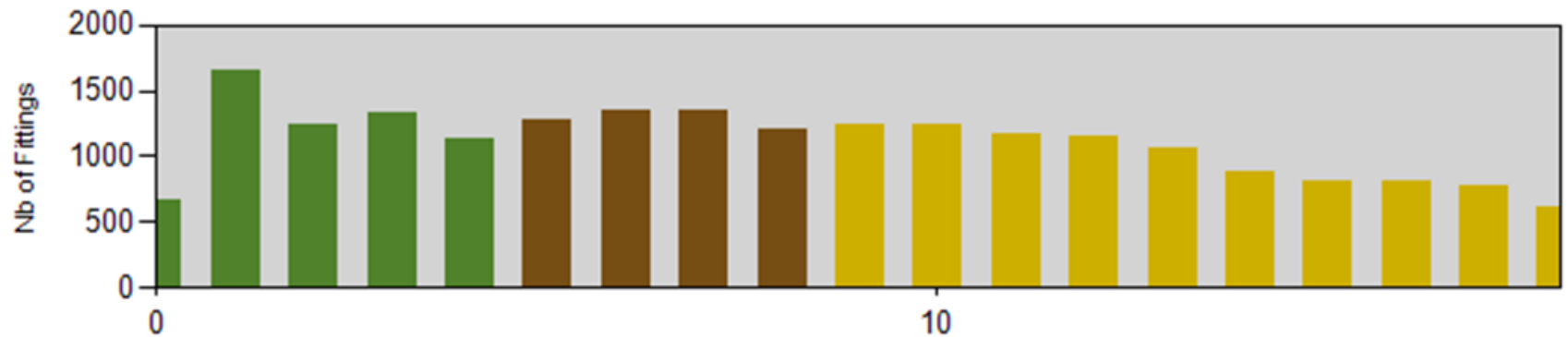


age group	
	0 - 4
	5 - 8
	9 - 18

» N=20,968

Fittings by age

Distribution of Fittings by Patient's Age

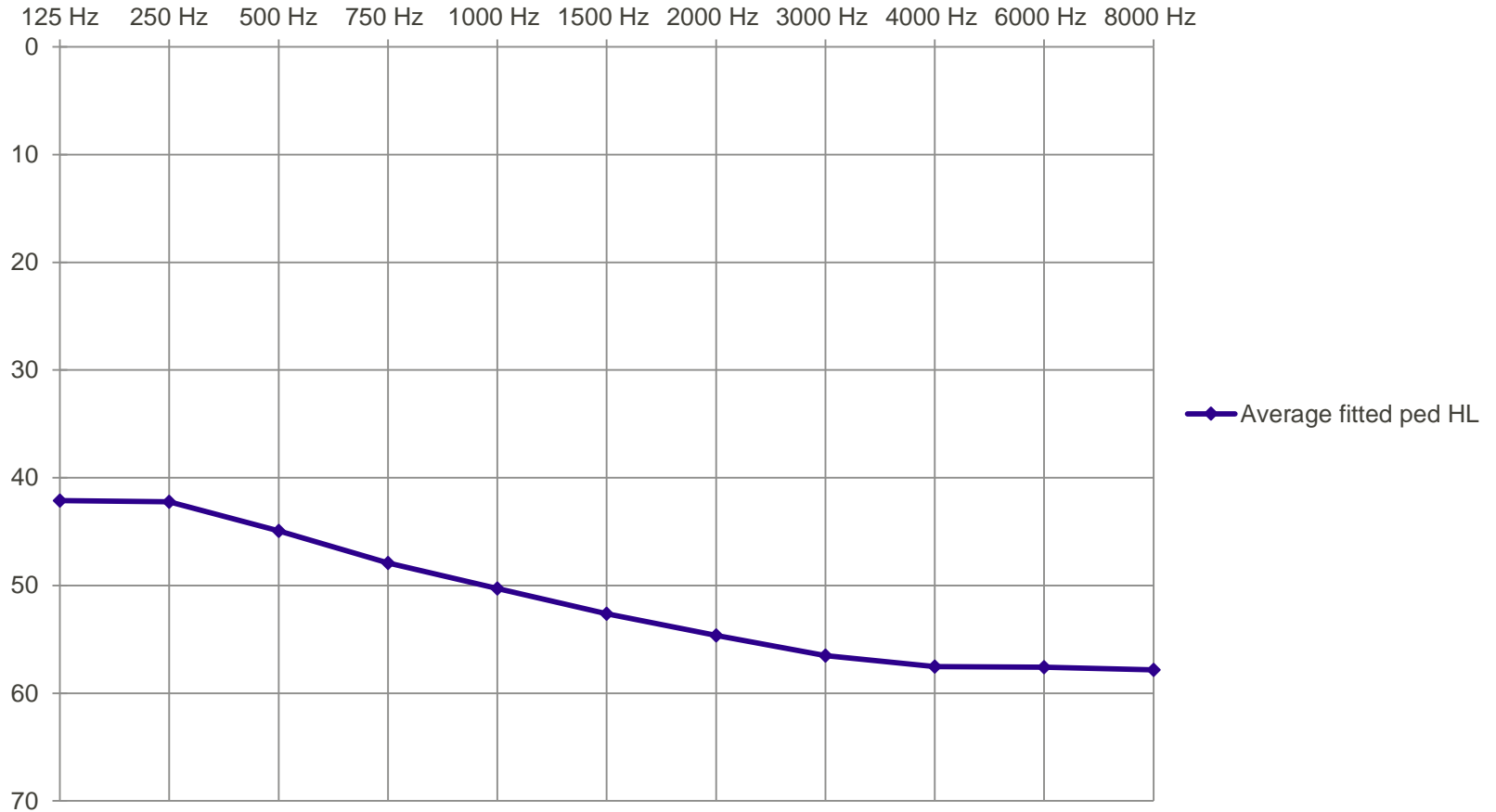


» N=20,968

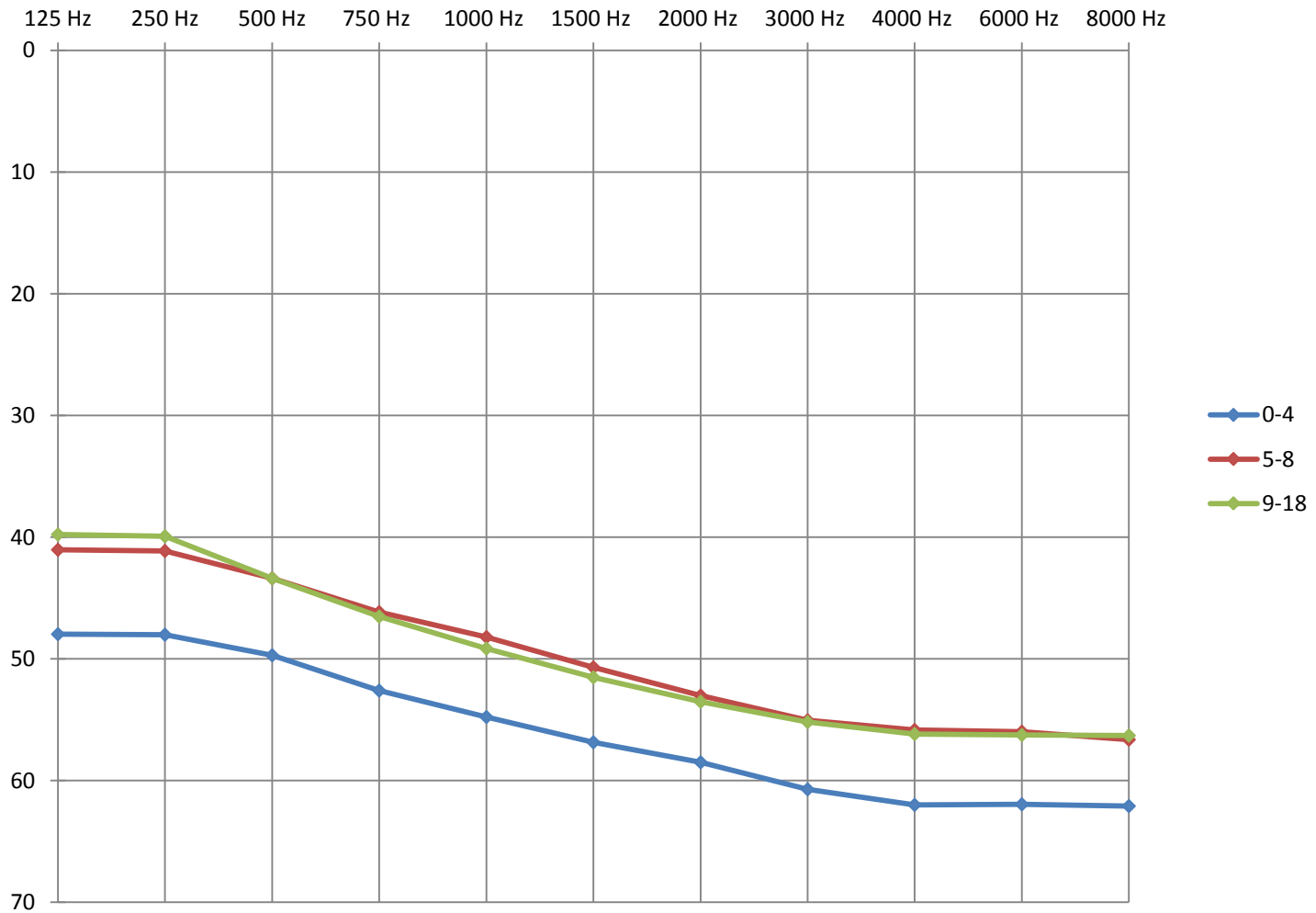
Do you think that hearing aids are fitted on children with more or less hearing loss on average than adults fitted with hearing aids?

Average pediatric HL fitted with air conduction instruments

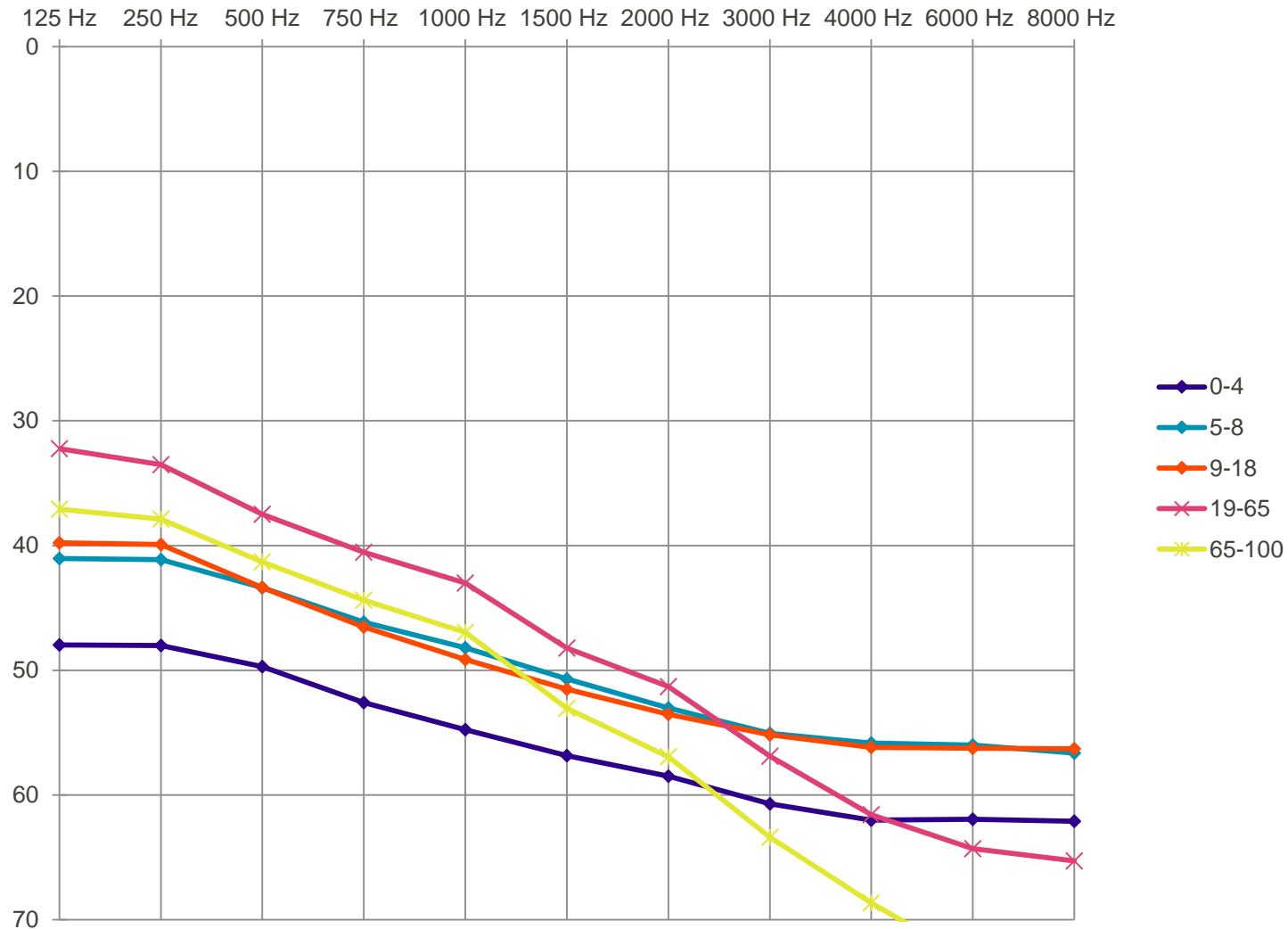
- 42 sloping to 58 dB HL → moderate sloping to moderately severe HL



Avg hearing loss fitted by pediatric age group



Fitted pediatric HL compared to fitted adult losses





Binaural fit rates?

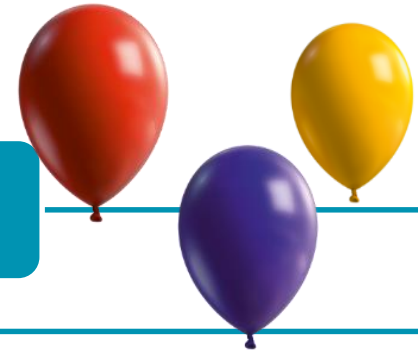
Unilateral Hearing Loss (UHL) – Prevalence

0.1-5% of school-aged children have UHL

~1/3 of children identified at NHS have UHL

Large variability in estimates due to differences in study method

How many patients with UHL/SSD use a hearing aid?



Psycho-social consequences of UHL: Quantitative study PedsQL

-PART 1

- 85 children and their parents,
 - »24 normal hearing,
 - »32 UHL,
 - »29 BHL
- Children with UHL reported poorer QoL than NH children on most scales but no statistically significant difference was found

-PART 2

- Specific questionnaire addressing the needs of UHL was developed and tested with 115 children
 - »35 normal hearing
 - »35 UHL
 - »45 BHL
- No difference in rating between children with BHL and UHL!
There is a need to provide a solution for these children

Quality of Life in Children with Hearing Loss

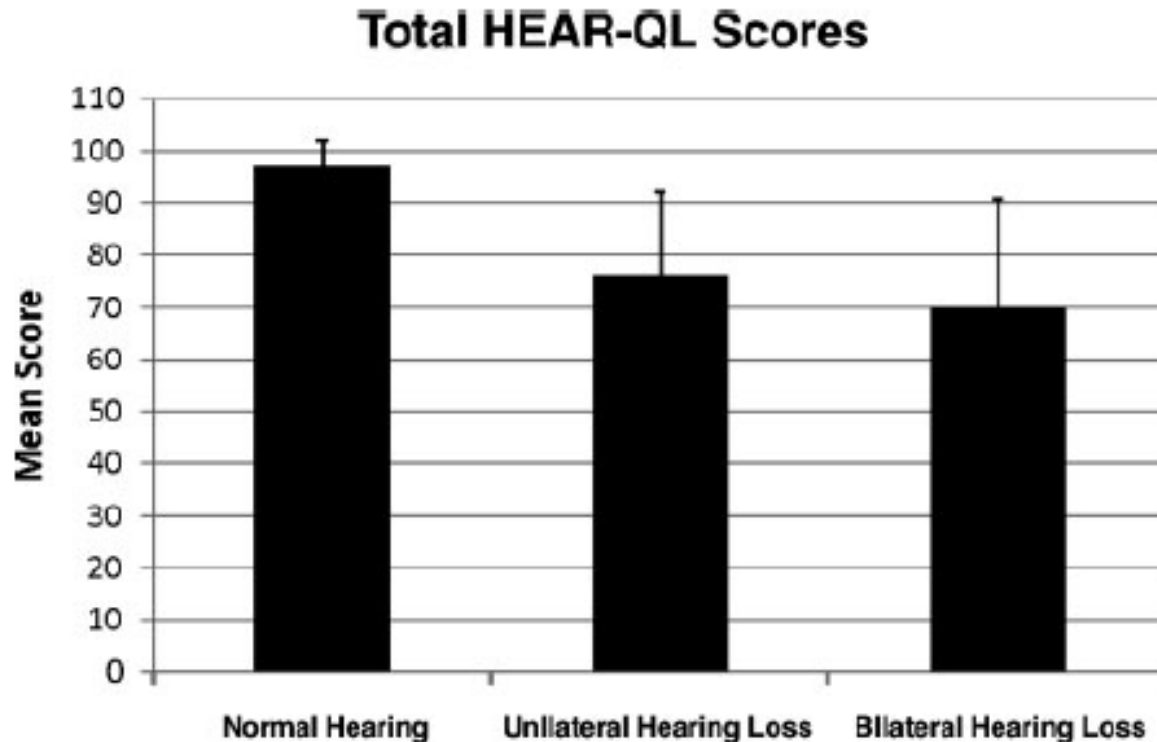
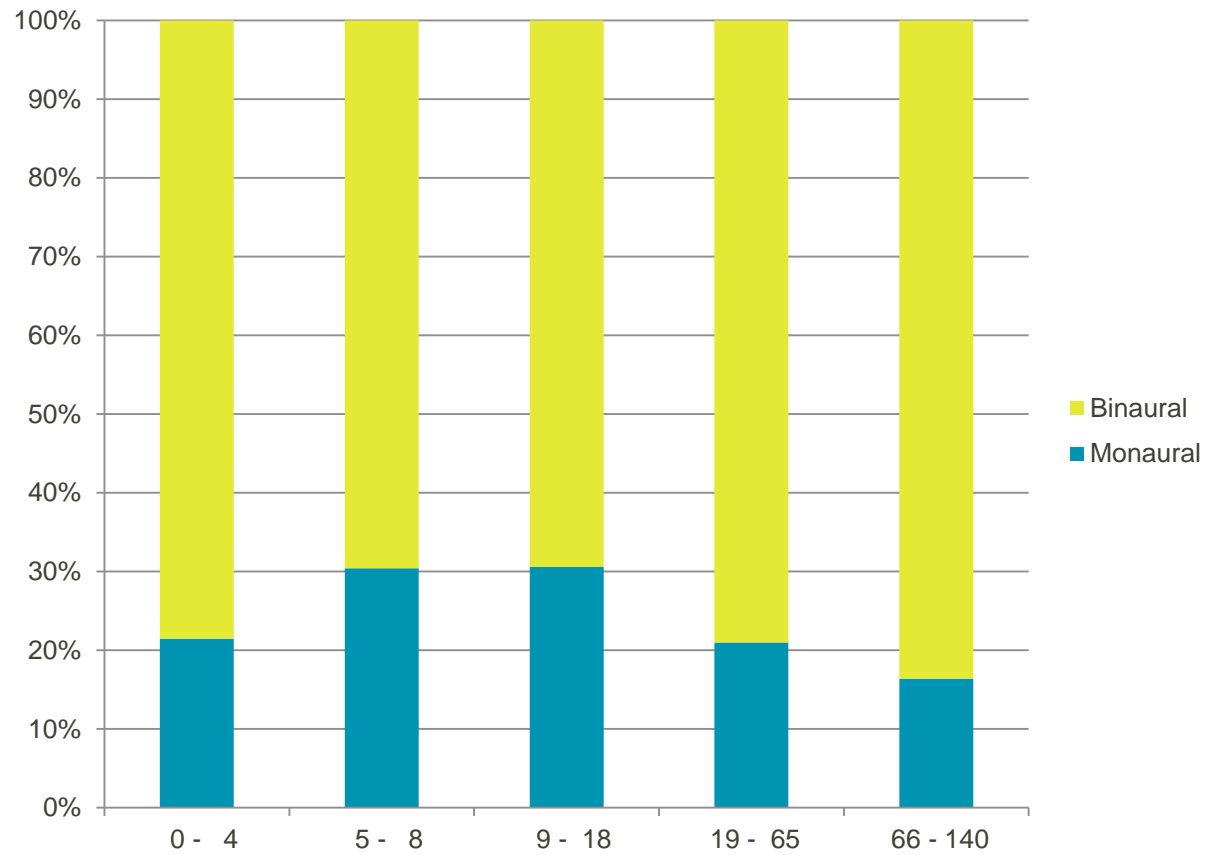


Figure 2 Mean (± 1 standard deviation) health-related quality of life score as measured by Hearing Environments and Reflection on Quality of Life (HEAR-QL) in 35 children with normal hearing, 35 children with unilateral hearing loss, and 45 children with bilateral hearing loss.

Unilateral fitting rates by age





Pediatric HI users



Pediatric HI fittings

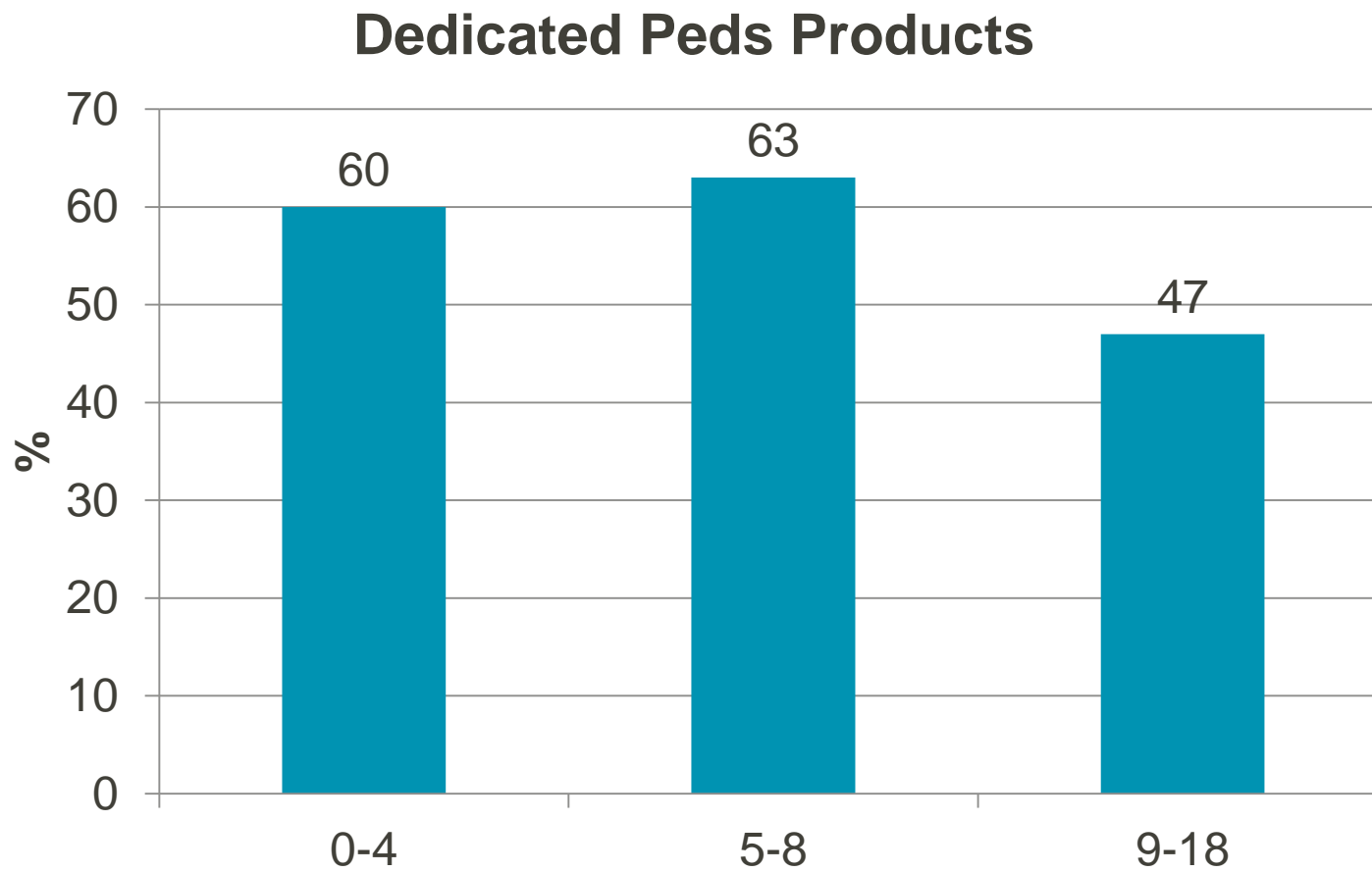


Pediatric HI use



Pediatric hearing care opportunities
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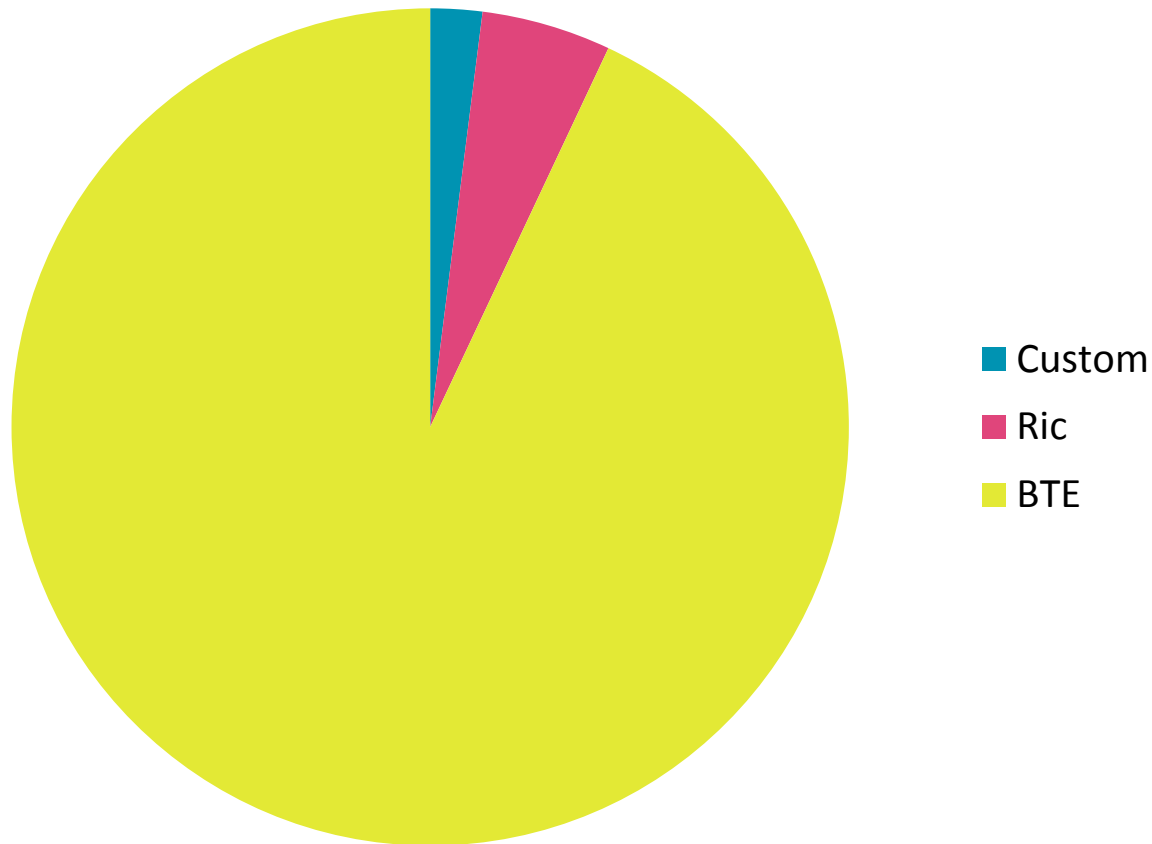
Use of dedicated pediatric products by age



What percentage of children under 19 fitted with hearing instruments use BTEs?

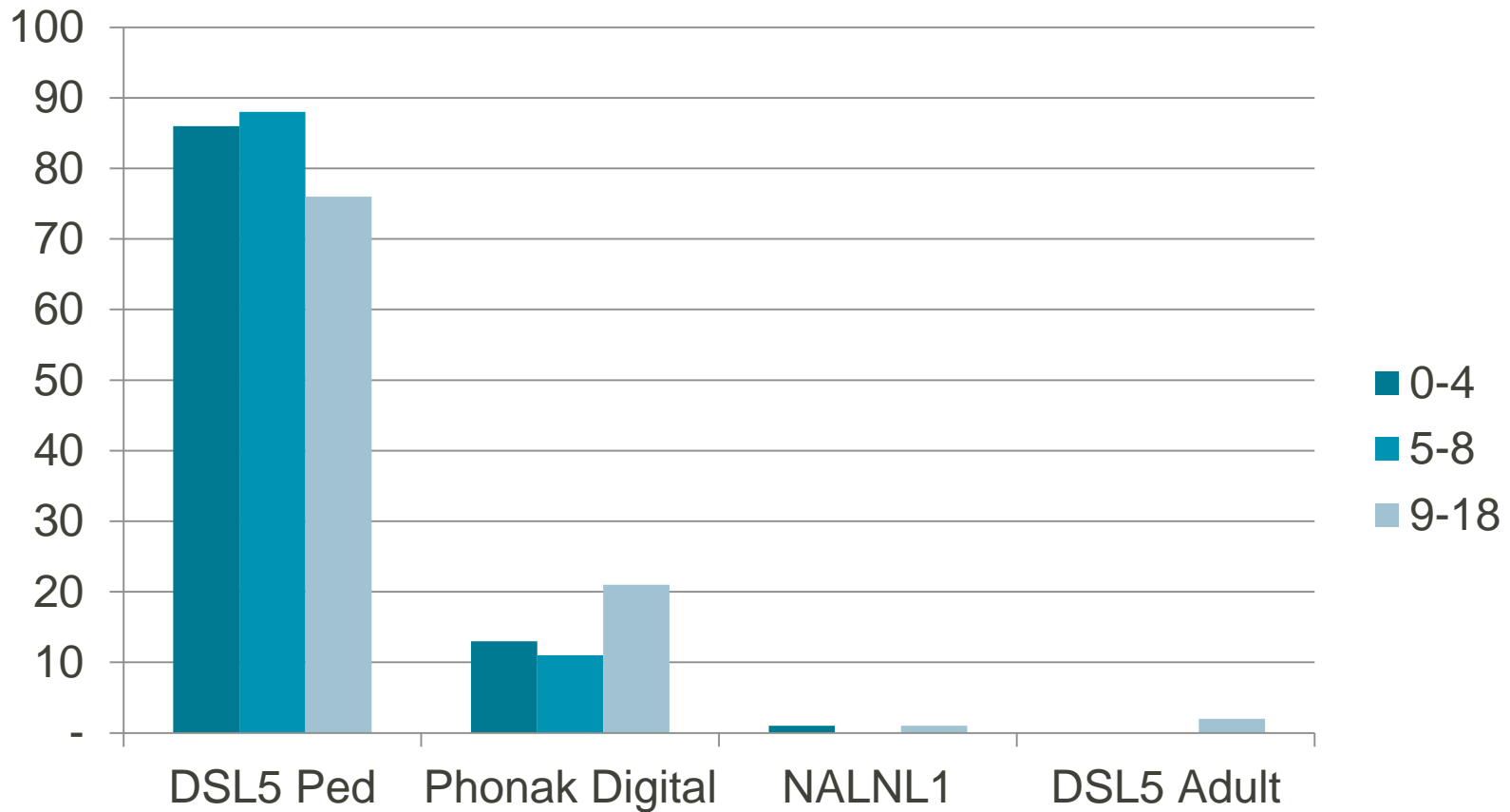
Style of device chosen for pediatric fittings

- 93% of products were BTEs

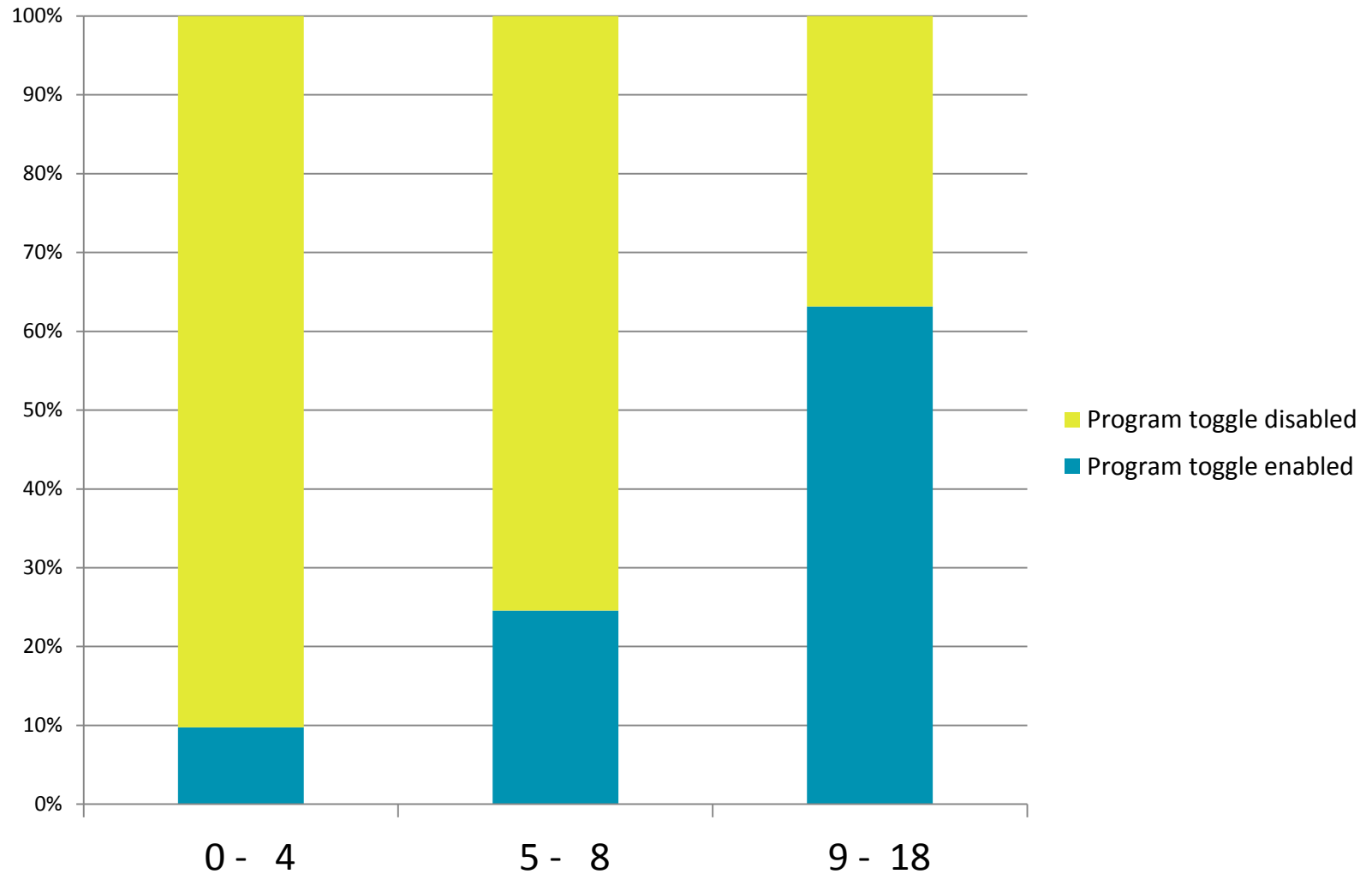


Prescriptive method

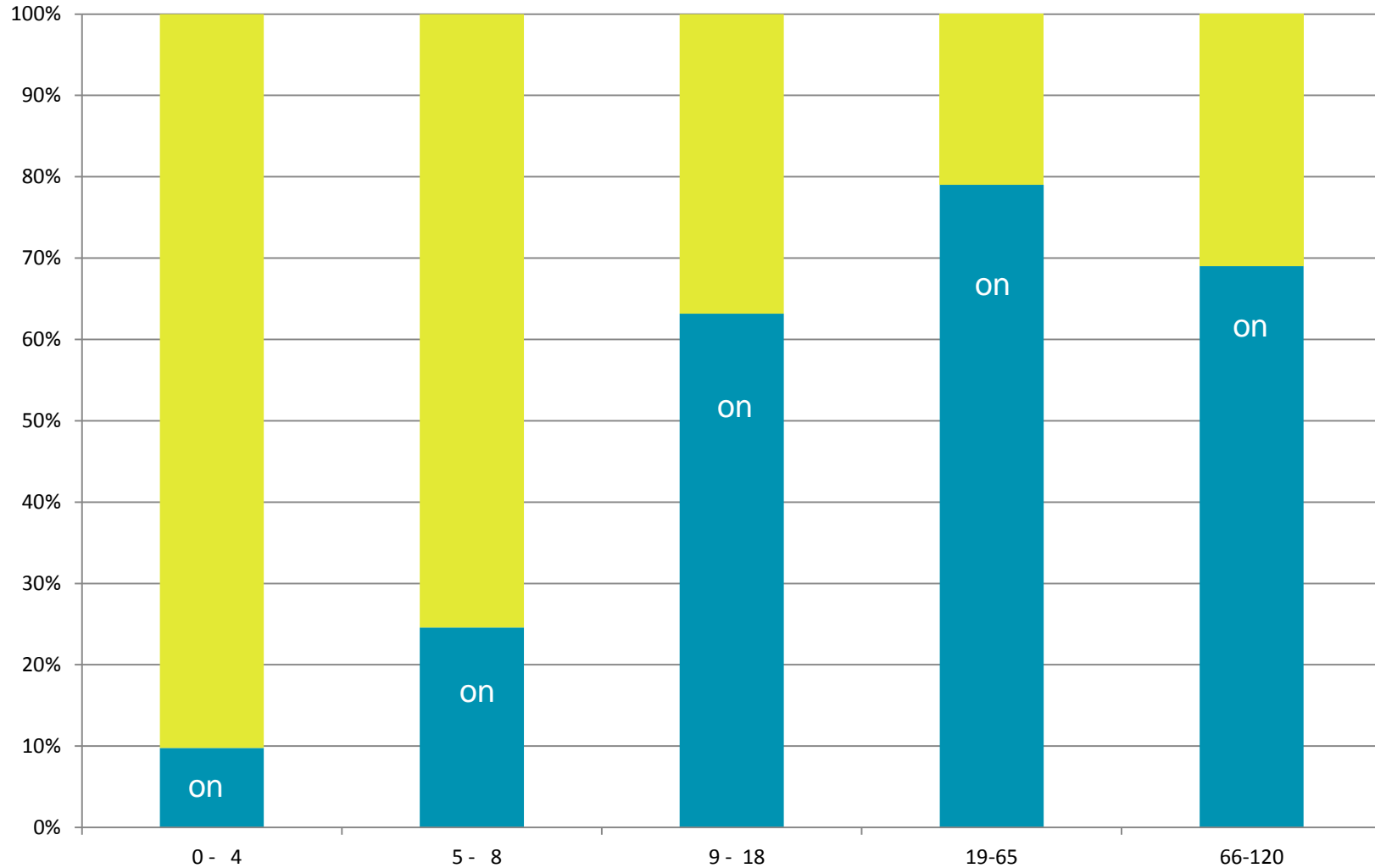
82% of all pediatric fittings captured in the US, applied DSL5 Pediatric formula



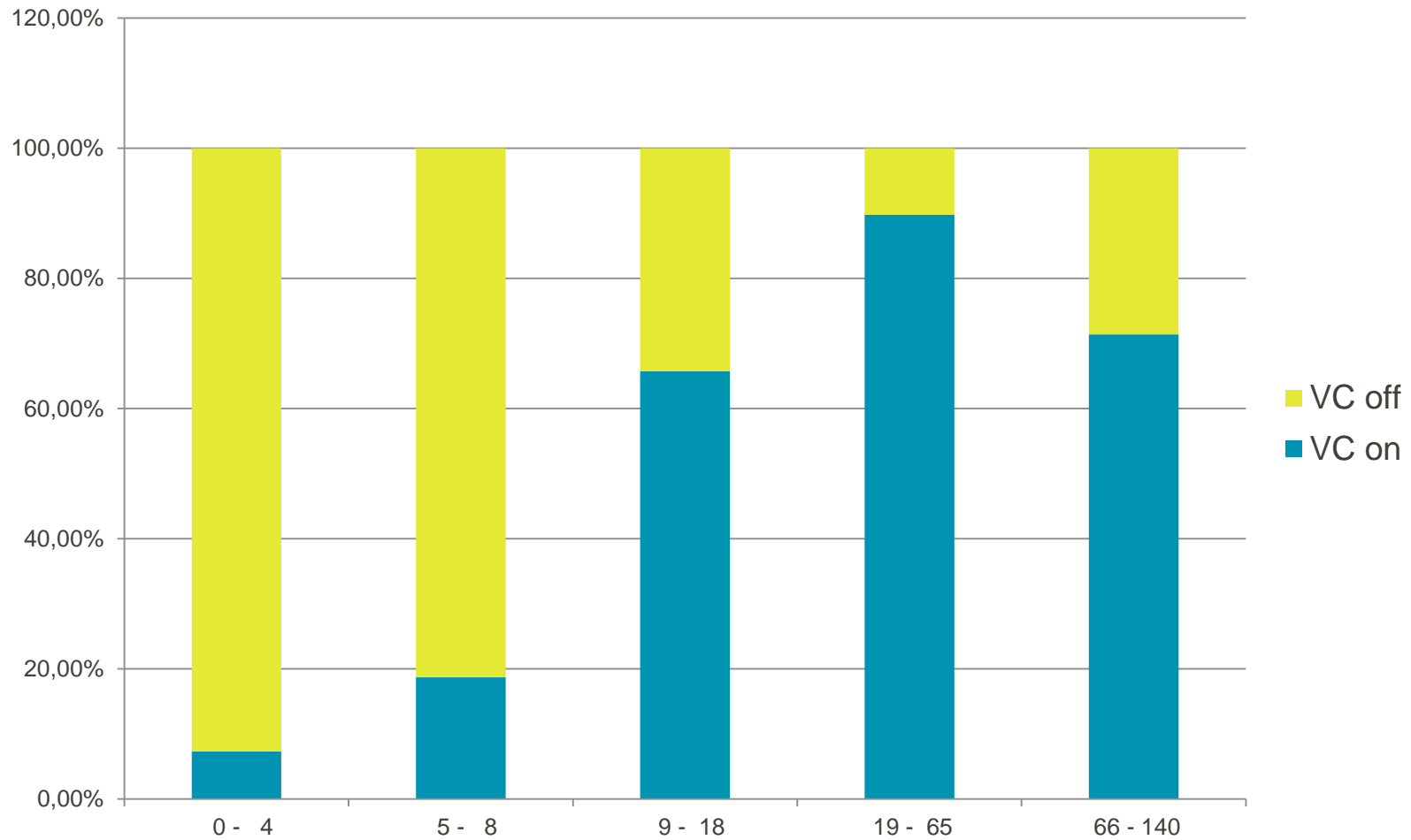
Provision of manual program toggle



Provision of manual program toggle



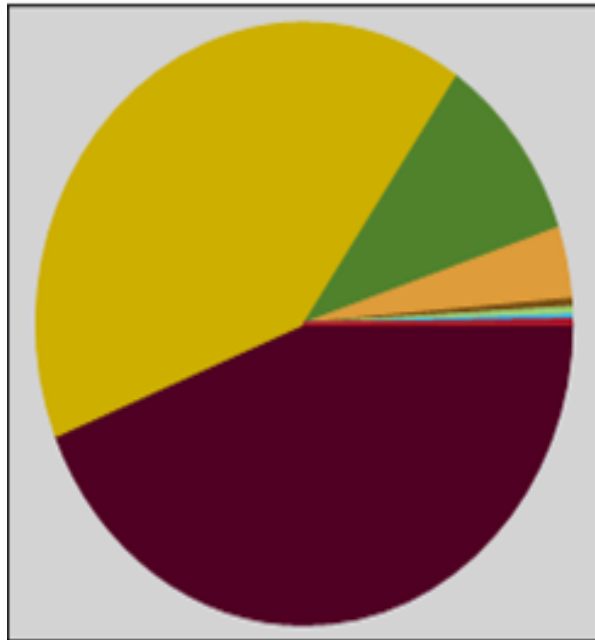
Provision of manual volume control



Roger + Mic is the default program in the programming software for children 0-18. How often do you think the Automatic mode is set as the default instead?

Use of programs

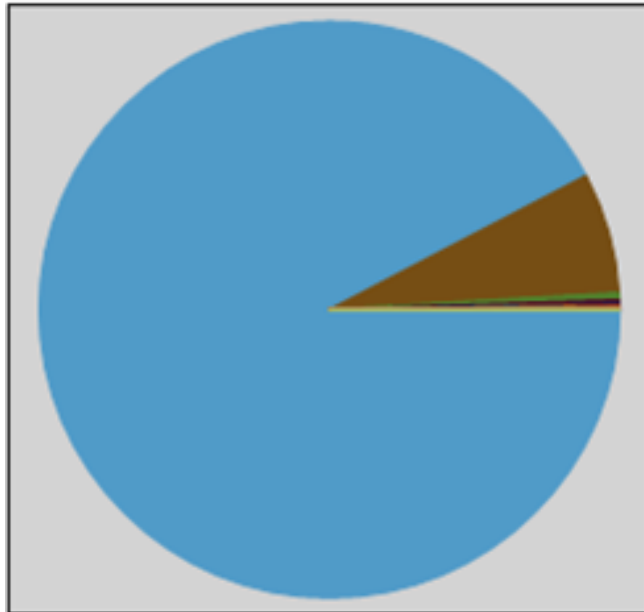
Distribution of Start-up Programs



program name	#install.	in %
calm situation fm	5226	43.90%
Sound Flow	4850	40.74%
speech in quiet	1215	10.21%
school fm mic	458	3.85%
speech in noise	51	0.43%
public buildings t coil mic	50	0.42%
phone t coil mic	26	0.22%
phone	16	0.13%
comfort in noise	5	0.04%
tv t coil mic	3	0.03%
custom	2	0.02%
music fm mic	2	0.02%

Adult start-up programs

Distribution of Start-up Programs

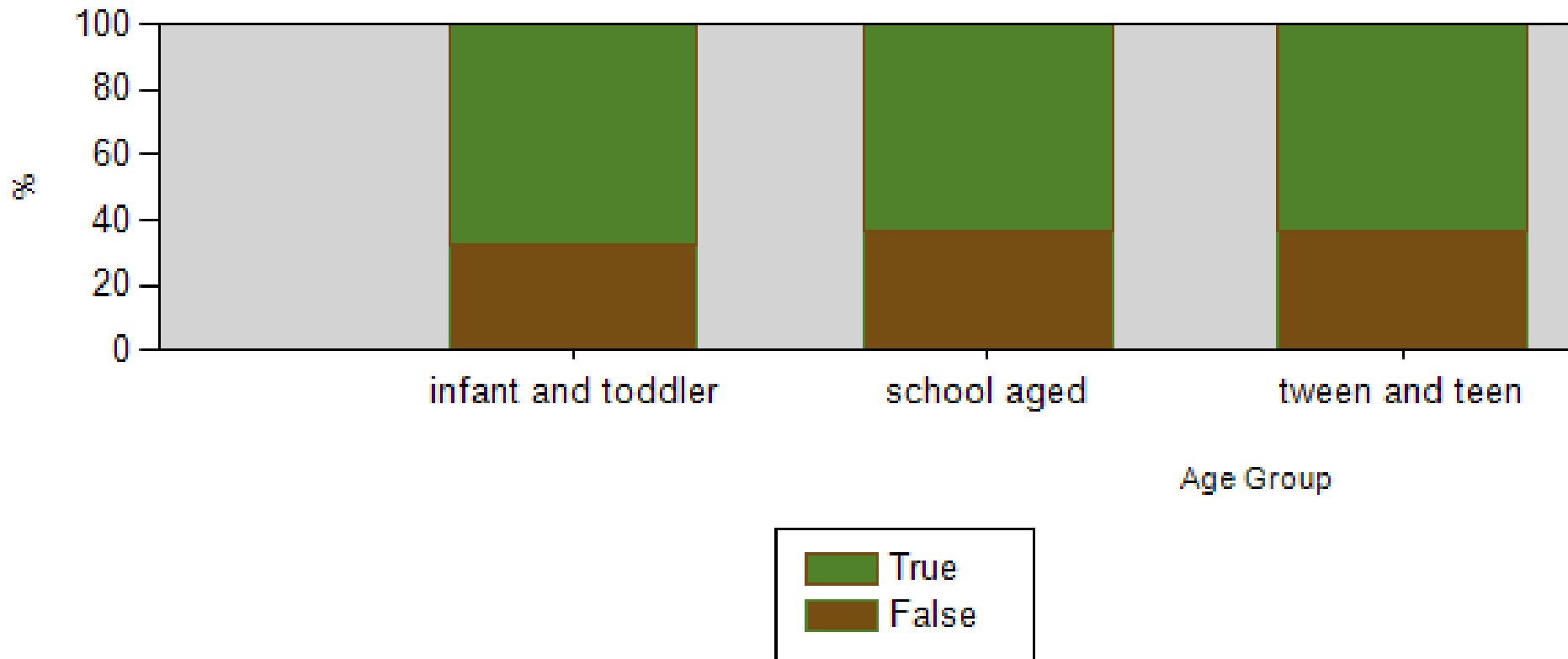


program name	#install.	in %
Sound Flow	116486	92.30%
speech in quiet	8549	6.77%
speech in noise	509	0.40%
calm situation fm	273	0.22%
school fm mic	102	0.08%
music	72	0.06%
comfort in noise	68	0.05%
phone	51	0.04%
manual direction	27	0.02%
custom	27	0.02%
speech in very loud noise	20	0.02%
phone t coil mic	11	0.01%
public buildings t coil mic	8	0.01%
reverberant room quiet	3	0.00%
tv t coil mic	2	0.00%
auto stereo zoom	2	0.00%

Does the application of
frequency lowering diminish for
teenagers?

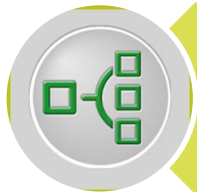
SoundRecover is applied in a majority of fittings for all pediatric groups

SoundRecover Usage by Age Group





Pediatric HI users



Pediatric HI fittings



Pediatric HI use

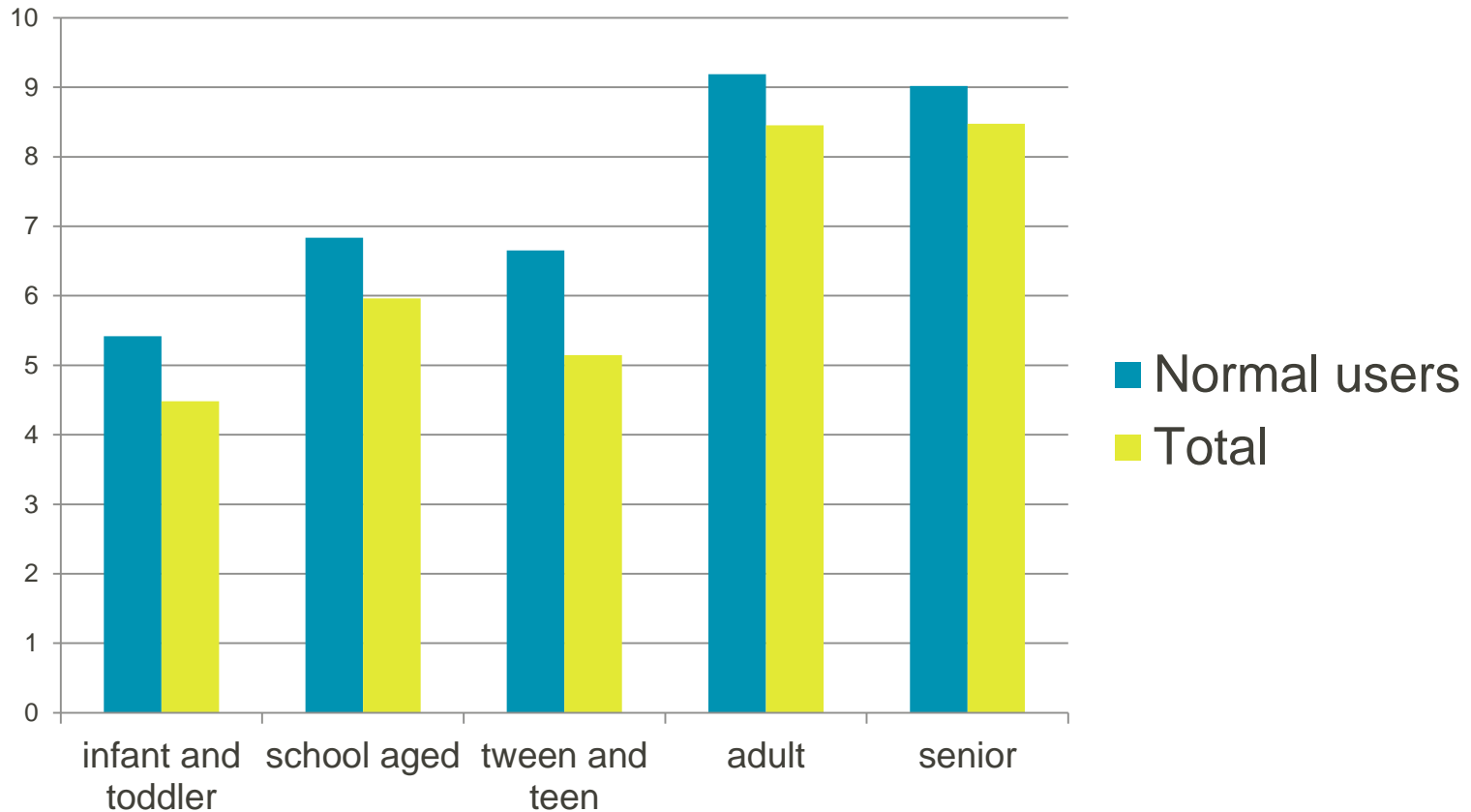


Pediatric hearing care opportunities
and markers of success

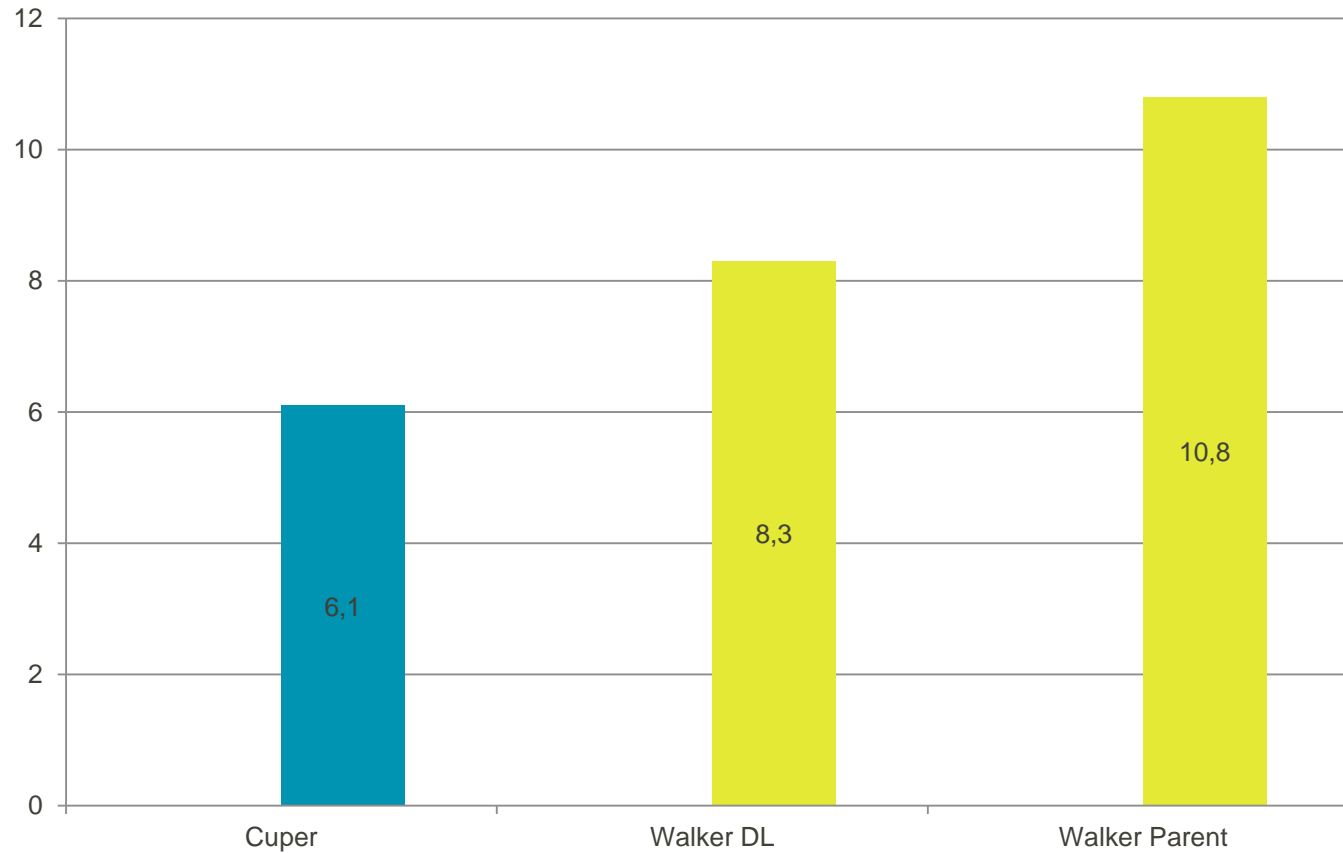
What is the average HI use
time for a child at 0, 5, 9 and 13
years of age?

Average use time by age group with and without “non-users”

Avg use by children with routine use = 6.1 hours

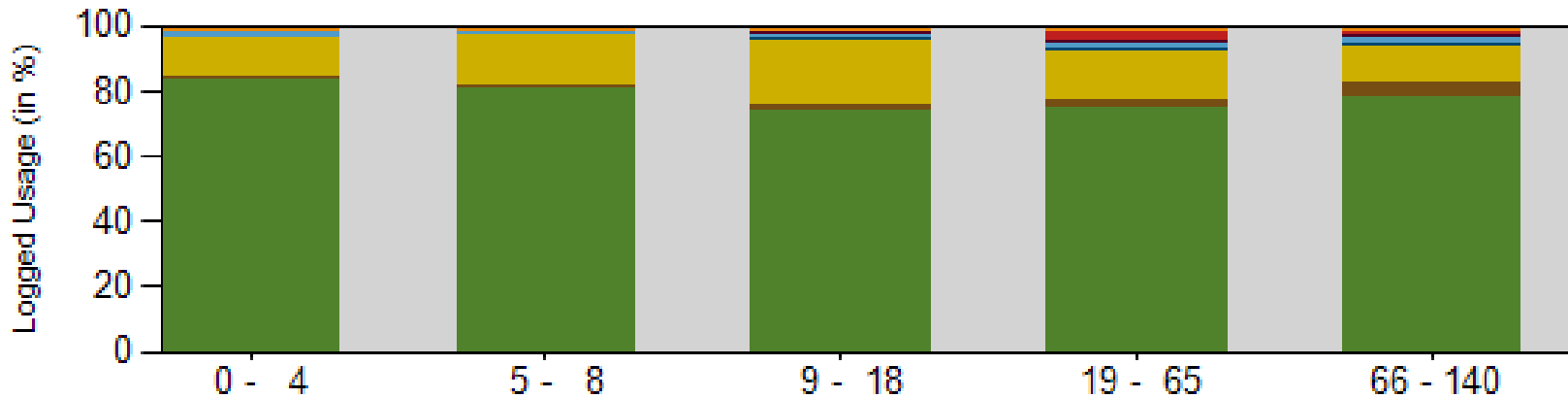
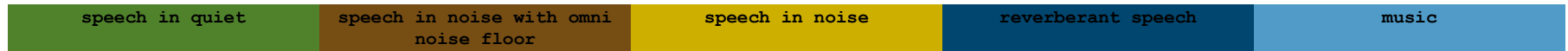


HA use in hours for children age (0-8)



Walker, Spratford, Moeller, Oleson, Ou, Roush and Jacobs (2013)

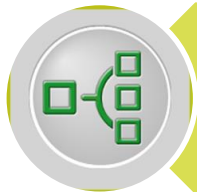
HI use by environment – according to the classifier



- » Depending on age, children are listening in calm situation for 75-84% of the time
- » Teenagers 9-18 spend more time in difficult environments than any other age group



Pediatric HI users



Pediatric HI fittings



Pediatric HI use



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Observations from Cuper



Success!

- Pediatric HL tends to be flatter than adult HL- making the reality of more occluding molds more appropriate and increasing likelihood of achieving broadband audibility including HF.
- Unilateral fittings are more common in children than adults, indicating that audiologists are identifying auditory needs in this population and successfully fitting UHL in children
- DSL5 Pediatric is applied in a vast majority of pediatric fittings, indicating that pediatric fittings are audibility based
- Frequency lowering is applied as often in teens as infants and young children indicating that sound quality does not become a barrier once kids begin to be more sensitive to and better reporters of signal processing preferences

Observations from Cuper



- **Opportunities**

- Majority of young and school aged children do not have access to multiple programs or an automatic. This highlights the need for continued work to determine if more automatic functionalities could be applied that would
 1. optimize hearing performance over a greater range of acoustic environments
 2. improve comfort and prevent fatigue in complex and loud environments
 3. be tailored to the specific acoustic and auditory needs of children
- Despite having minimal access to sound cleaning solutions, school aged children and teens have equal or more exposure to noise as a portion of the day, posing the question- are we doing enough to provide consistent and comfortable access?
- Average use time for children of all ages remains substantially less than for adults with hearing loss. If we believe that “full time, consistent use” is necessary for optimal functional auditory outcomes, then we need to identify what the real life barriers are and help families develop solutions to those challenges.

Obrigada!

