Age related hearing loss
Hearing Impairment

• > 10 million UK residents have a hearing loss
  – 6.4 million > 65 years of age
  – 3.7 million working age (16 - 64 years)
  – By 2031 estimated 14.5 million with hearing loss in the UK
  – WHO predicts that by 2030 adult onset hearing loss will be in the top ten disease burdens in the UK, above diabetes and cataracts

• Hearing Aids
  – 2 million UK residents have hearing aids (1.4 million use them regularly)
  – 6 million UK residents would benefit from hearing aids
  – 4 million people do not have hearing aids would benefit from them

Facts and figures on hearing loss and tinnitus. Action on Hearing Loss (2011)
Speech

Fant (2004) Speech acoustics and phonetics
Moore and Glasberg (1986) Comparisons of frequency selectivity in simultaneous and forward masking for subjects with unilateral cochlear impairments. JASA, 80 93-107
Presbyacusis


80 year old male
Hearing loss

• Loss of high frequency audibility
• Smearing of frequencies

• Speech in noise (noise may be other speech)
  – (added impact of SNR, reverberation)
  – Reduced audibility of higher frequencies
    • Hearing aids aim to increase audibility but also increase noise (noise reduction and direction microphones)
  – Frequency smearing, hearing aid cannot help as sensory organ deficient
Simulated hearing loss

Without noise  with noise

Normal Hearing

Frequency smearing

Frequency smearing missing high frequency components (mild loss)

Mild hearing loss (amplitude)

Loss of auditory nerve fibres without destroying cochlear sensory cells. Thresholds returned to normal but ABR suprathreshold amplitudes reduced.


**Figure 1.** Mean SRTs for two hearing-impaired subjects (with similar audiometric configuration and speech-recognition ability in quiet) at two noise levels (75 and 85 dB SPL).