

Hearing impaired and deaf people in New Zealand:

an update on population numbers
and characteristics

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Summary

The first population survey of people with hearing loss in New Zealand of any size was carried out in 1991. These data, together with those from the subsequent census in 1996, in addition to data available from other sources were collated in an earlier report (Greville, 2001). The current report includes further information available from projects associated with the 2001 census.

Results show that the prevalence of hearing loss varies from 10.3%, or just under 400,000 people (for people reporting hearing loss) to 0.05%, or 2,100 people over 15 years who cannot hear 1 person talking.

Men are much more likely to suffer from hearing loss than are women. This difference is similar to that found in other developed countries and appears to be attributable to noise-induced hearing loss. Age has a major effect on hearing loss, and there is a clear interaction between gender and age.

The census study of 1991/92 has proved the most useful. In the more recent censuses limitations have been identified with the identification of hearing loss *following* a response to a disability question. It is recommended that future census studies ask about hearing loss directly, in line with the approach taken by the US National Center for Health Statistics and the Australian Bureau of Statistics.

The 2001/2 study estimated that, overall, 29% of people with hearing disability (66,600 people) used hearing aids. An estimated 34,500 people indicated that they needed hearing aids, but did not have them. Affordability was the major issue for 23,000 people (67%).

Introduction

An earlier report on the same subject was released in October 2001, prior to the availability of information from the 2001 census disability survey. The 2001 report should be sourced for information not included herein, including regional distribution of hearing loss and information from the National Audiology Centre's databases.

While there has thus far been no one project aimed solely at defining the hearing impaired and deaf populations of New Zealand, three censuses (1991, 1996, 2001) have included spin-off projects carried out by Statistics New Zealand to define numbers suffering from disability and/or health problems. Hearing loss, in the 1991/92 study, or disability attributed to hearing communication difficulty (1996; 2001) has been one of many disability and/or health issues addressed.

The aim of this project is to update information from various sources, including data collected by Statistics NZ and analysed by or for the Ministry of Health, concerning the:

- numbers of hearing impaired and deaf people in New Zealand
- incidence of hearing loss as a factor of age, gender, and where possible, race
- relationships between hearing loss and social factors (eg income, employment) compared to the New Zealand population norms
- relationships between hearing loss and other disabilities

Methods

The different population projects have used different sample sizes, and have asked respondents different questions, described in outline form in Table I.

Survey	Numbers questioned	Sample description
1991/92	7, 065	People in households
1996/97	20,848 (4,100 with some disability; 16,750 without any disability)	a) Sample of people living in households
	1,016 people from 130 facilities	b) people 15+ years of age living in health-related long-stay residential facilities
2001/02	28,110 (7,256 with some disability; 20,854 without any disability)	a) Sample of people living in households
	928 people from 118 facilities	b) people 15+ years of age living in health-related long-stay residential facilities

Table I: Survey sample sizes and descriptions.

The 1991/92 survey was limited to just over 7,000 households, selected on a nationally statistically representative random basis. This means that estimates are subject to fairly large sampling errors, with all estimates below 45,000 being subject to sampling errors of 30% or more. Reliable estimates are not available for small geographical areas nor for small population groups. In addition, there is an under-estimation of numbers with hearing loss because only non-institutionalised people were included. Fuller descriptions of the methodology are given in *A Picture of Health* (1993) and Triggs et al (1994).

The 1991/2 study asked respondents directly:

- Do you (or does *Johnny*) have any of the following:
 - a) Hearing loss?
 - b) Sight loss?
 - c)

The 1996/7 study was less direct, asking adult respondents firstly whether they considered themselves to be disabled:

- Do you have any condition or health problem that makes it impossible (or difficult) for you to do everyday things that people of your age can usually do?

This question is fairly loaded as far as hearing impairment is concerned particularly since hearing loss is popularly associated with advancing age. The design of this question ensures conservative estimates of prevalence for hearing loss.

In the follow-up study, more specific questions followed:

- Can you hear what is said in a conversation with one other person?
- Can you hear what is said in a group conversation with three other people?
- Use of special equipment for deaf/hard of hearing

People who answered No to the first sub-question (ie they could not hear what was said in a conversation with one person) were considered to be deaf. Those who answered Yes to the first sub-question, but No to the second were considered to be hearing impaired.

Children's guardians were asked more directly:

- Is the child deaf or having trouble hearing which is not currently corrected?

The reference to correction here is inappropriate for hearing loss, since a hearing aid and / or a grommet cannot correct hearing loss in an analogous way to lenses and sight, and may have introduced its own bias. In any event, it would be more useful to be counting the children who use hearing aids, rather than excluding them. With this question, some will be excluded and others included depending on how respondents interpret the question.

Full details of the methodology are available from the Statistics NZ report, Disability in New Zealand (1998).

The 2001 disability survey followed a similar methodology to the 1996/97 survey. The questions were modified slightly to ask if people either could not *or had difficulty in* hearing conversations with 3 other people, or 1 other person.

People were not considered disabled if their hearing problems were said to be corrected by the use of hearing aids – unless they were a child. All children using hearing aid/s were counted as having a hearing loss. This methodological decision limits the usefulness of the data as estimates of the number of people with hearing loss, and the number of adults using hearing aids and other assistive technologies.

Full details of the methodology are available from the Ministry of Health's report: *Living with Disability in New Zealand* (2004).

Results & Discussion

Overall prevalence

The different studies have asked different questions, and not surprisingly, have come up with different estimates of prevalence (see Table II).

The overall prevalence rate of 9.8% for the non-institutionalised population is slightly higher than the 8.3% found in a study with similar methodology in the US (Adams et al, 1999).

Definition	Prevalence (%)	Numbers	Source of data
Hearing loss (including estimate of institutionalised)	10.3	390,600	1991/92 census
Hearing loss (non-institutionalised)	9.8	368,600	1991/92 census
Hearing disability (non-institutionalised + residential care populations)	6.6	233,550	1996/97 census
	6.5	241,800	2001/2 census
Hearing disability (non-institutionalised)	5.7	214,400	1996/97 census
	6.3	230,800	2001/02 census
Deafness [†] causing disability (15 years+ only)	0.07	2,600	1996/97 census
	0.05	2,100	2001/02 census
Children (0-14 years) with hearing disability	2.2	18,300	2001/02 census

Table II: Overall prevalence estimates for various definitions of hearing loss among NZ population.

[†] Cannot hear one other person talking

The census data provide limited information regarding degree of hearing loss. The 2001/2 survey asked two questions relating to the ability to hear conversations in an attempt to differentiate those with severe losses from the total hearing impaired population. These data are presented in Table III.

Categories of hearing disability	Estimated number	Prevalence (%)
Can hear conversation with three other people but with difficulty	194,000	5.3
Cannot hear conversation with three other people	8,400	0.2
Can hear conversation with one other person but with difficulty	106,100	2.9
Cannot hear conversation with one other person	2,100	0.05

Table III: *Categories of hearing limitation in adults living in households, 2001.*

Note that the categories are not mutually exclusive.

24,300 people (15+ years) living in households with hearing disability described their level of disability as severe. This number would include people with other disabilities in addition to hearing disability.

For people in residential care where hearing disability was the person's main disability, 55% described their degree of disability as severe.

Age

It is well known that hearing loss is associated with increasing age. The population studies (see Table IV) indicate that prevalence of hearing loss (regardless of definition) amongst people over 65 years of age is about 3.5 times of those of younger adults (15-64 years). More detailed analysis shows ever-increasing rates of hearing loss starting from age range 25-44 years.

Age group	Hearing loss (non-institutionalised) 1991/92	Hearing loss causing disability 1996/97	Hearing loss causing disability (non-institutionalised) 1996/97	Hearing loss causing disability (non-institutionalised) 2001/2	Hearing loss causing disability (residential care) 2001/2
0-4				4,300 1.7%	
5-9				8,000 2.7%	
10-14				5,900 2.0%	
0-14	48,800 5.6%	23,100 2.7%	20,800 2.6%	18,300 2.2%	
15-24	18,400 3.3%	9,200 1.8%			
25-44	87,800 7.8%	35,200 3.4%			
45-64	101,900 13.7%	71,100 10.4%		76,500 9.1%	400
15-44				43,000 2.7%	
15-64	208,100 8.4%	128,900 5.3%	115,500 5.2%	119,500 4.9%	450 25.0%
65-74	53,800 22.7%	35,600 15.3%		41,600 17.3%	700
75+	57,500 34.0%	42,400 25.5%		51,300 28.5%	9,800
65+	111,300 27.0%	98,100 22.4%	78,000 19.5%	92,900 22.1%	10,500 42.0%
15+				212,500 7.5%	

Table IV: Estimated numbers and prevalence by age group and various definitions of hearing loss among the New Zealand population.

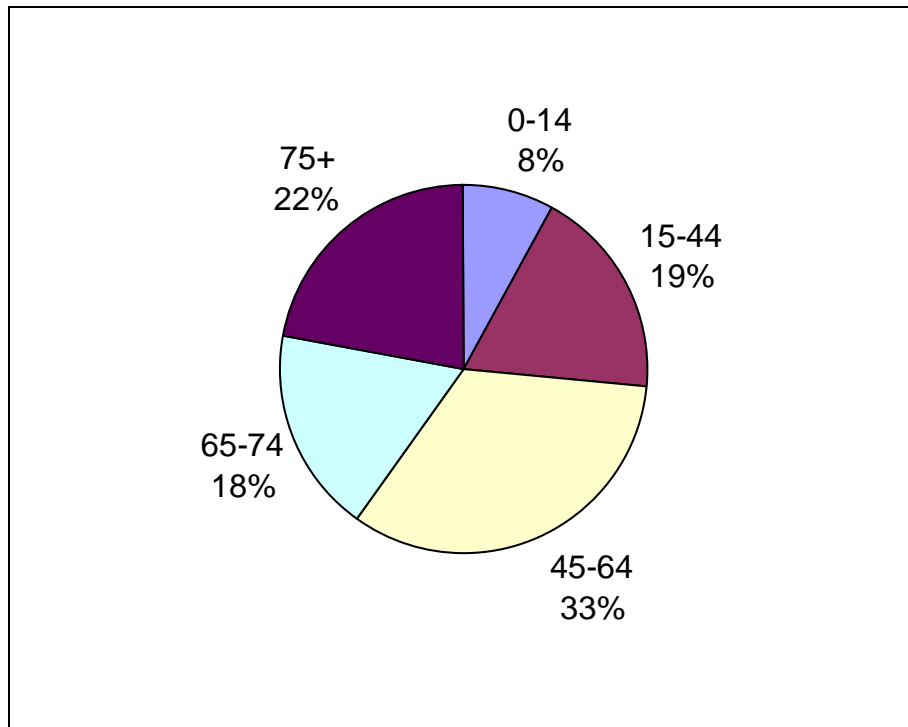


Figure 1: Age make-up of NZ's population with hearing loss causing disability (2001/2).

The 2001/2 study showed a prevalence of parental-reported hearing loss causing disability among children 0-14 years old of 2.2%. Within this group, the highest prevalence (2.7%) occurred among the 5-9 year old children, the group most likely to be identified as having otitis media. These rates are considerably lower than the rate of 5.6% found in 1991, probably because children treated by grommets were deemed not to have a hearing disability.

Gender

The three census studies show a significantly greater number of males than females with hearing loss (see Table V).

The 1991/92 study showed percentage differences which overall show that over 90,000 more males than females suffer from hearing loss. This finding is all the more dramatic because of the lower life expectancy for males, and the strong association of hearing loss with age.

Gender	Hearing loss 1991/92 study	Hearing disability 1996/97 study	Hearing disability 2001 study
Male	229,500 12.3%	127,900 6.8%	122,900 7.5%
Female	139,100 7.3%	86,400 4.5%	89,600 5.2%
Male-female difference	90,400	31,500	33,300
Male-female Ratio	1.65 : 1.00	1.48 : 1.00	1.37 : 1.00

Table V: Estimates of numbers and prevalence for each gender and various definitions of hearing loss among people (15+ years) living in households.

The 2001/02 disability study of children under 15 years showed that boys (2.4%) were more likely than girls (1.9%) to have hearing disability. The gender difference amounted to an additional 2,600 boys compared with girls with hearing disability.

Gender & age

There are unequivocal interactions between gender and age with both definitions of hearing loss (see Figures 2-3 and Tables VI-VII).

The slight difference between males and females in the 0-14 and 15-24 year age groups (see Tables VI and VII) can be attributed to the higher vulnerability of male children to hearing loss and deafness, along with all other disabilities.

The greater prevalence of hearing loss among men than women is presumably at least partially related to hearing loss associated with noise exposure.

Age group	Male	Female	Male-female difference
0-14	28,300 6.3%	20,400 4.8%	7,900
15-24	11,000 3.7%	7,400 3.0%	3,600
25-44	66,000 12.0%	21,800 3.8%	44,200
45-64	64,400 16.6%	37,500 10.7%	26,900
65-74	34,300 31.6%	19,500 15.1%	14,800
75+	25,000 40.2%	32,500 30.0%	-7,500

Table VI: Estimated numbers and prevalence for various age groups and gender for people with hearing loss living in households (1991/92 study).

Age group	Male	Female	Male-female difference
0-14	10,400 2.4%	7,800 1.9%	2,600
15-44	20,900 2.8%	22,200 2.7%	-1,300
45-64	50,900 12.1%	25,600 6.1%	25,300
65-74	25,900 22.3%	15,800 12.6%	6,000
75+	25,300 35.1%	26,000 24.1%	-700

Table VII: Estimated numbers and prevalence for various age groups and gender for people with hearing disability living in households (2001/2 study).

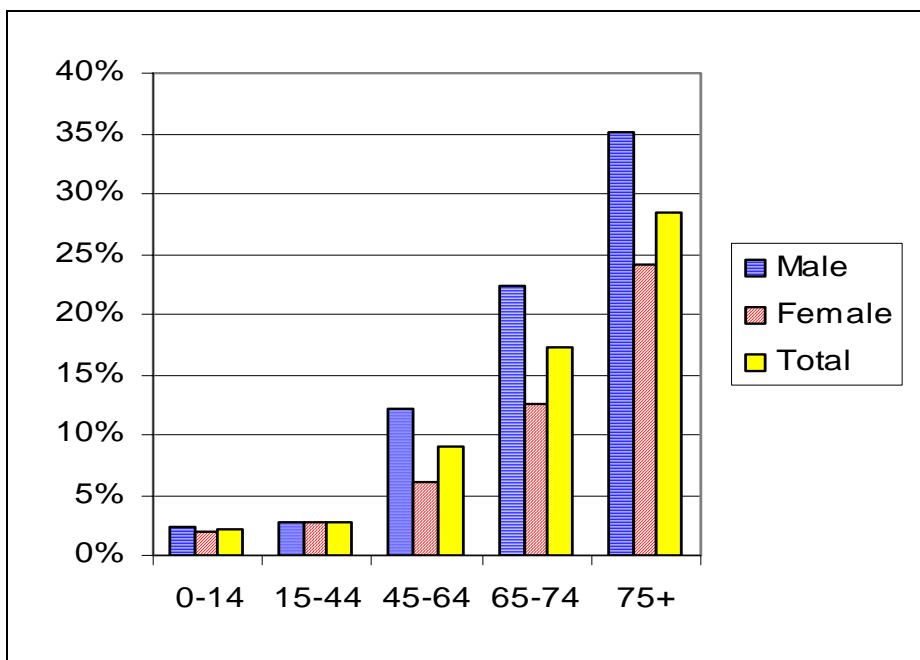


Figure 2: Prevalence of hearing disability for people living in households by age and gender (2001/2)

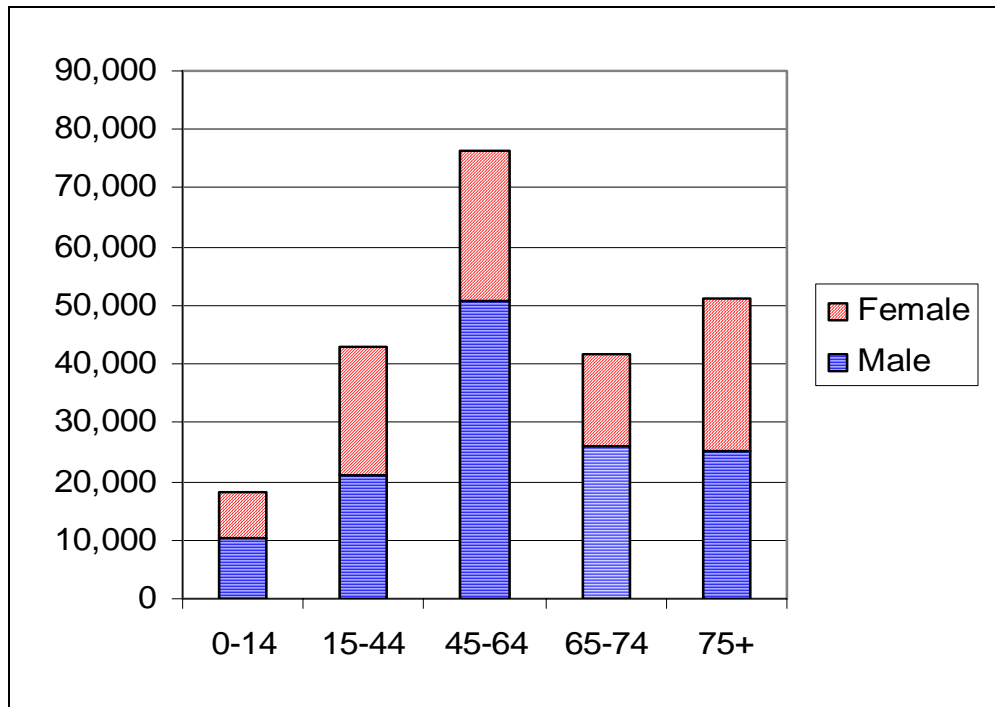


Figure 3: Numbers of people living in households with hearing disability by age and gender (2001/2)

Ethnicity

The 1991/92 study found that in the total household population, Maori had a lower prevalence rate of hearing loss (7.9%) than non-Maori (10.0%). This finding was somewhat surprising, given that many studies of specific sub-populations have found a much higher incidence of hearing loss among Maori compared with non-Maori. The difference is explicable by the dramatically reduced life expectancies of Maori. When adjustments were made for this, the prevalence of hearing loss for Maori was found to be 12.1% compared with 9.6% for non-Maori.

Ethnic data from the 2001/2 survey are shown in Table VIII and Figure 4. The prevalence of hearing disability among Maori among the younger age groups is considerably higher than among non-Maori. Hearing disability was the most common disability in Maori 15-24 years, the prevalence being 3.5 times that of non-Maori. At the over-65 years group, prevalence for Maori and non-Maori converge.

Age group	NZ Maori	Non-Maori	Pacific Island	European
0-14 years	8,000 4.1%	10,300 1.6%	1,400 2.0%	
15-24 years	3,300 3.6%	1.0%		
25-44 years	8,500 5.8%	2.9%		
15-44 years	11,800 4.7%	31,200 2.0%		27,700
45-64 years	8,500 12.3%	68,000 8.8%		64,200
15-64 years	20,300 6.3%	99,200 4.3%		91,900
65 + years	4,200 24.4%	88,800 22.0%		85,000
15+	24,500 7.3%	188,000 6.8%	4,800 3.2%	176,800
Total	32,500 6.1%	198,300 5.9%	6,200 2.7%	

Table VIII: Numbers and prevalence estimates for age bands and racial grouping for hearing disability among people in households (2001/2 study).

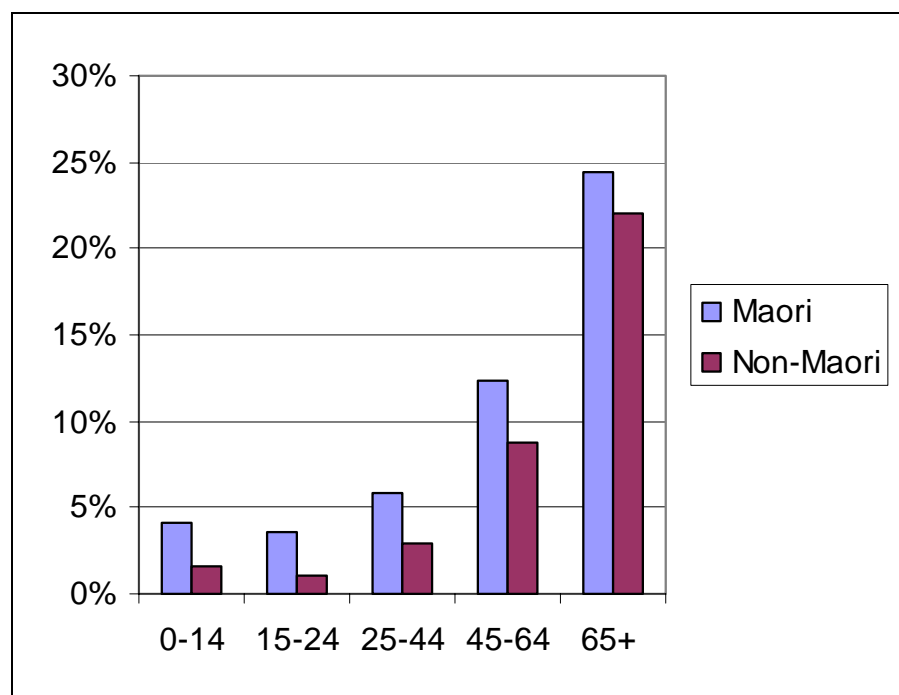


Figure 4. Prevalence of hearing loss causing disability for Maori & non-Maori in different age-bands (2001/2).

Of the 24,500 Maori adults living in households with hearing loss causing disability, 11,300 listed it as their main disability.

Despite the fact that Maori were more likely than non-Maori to have hearing loss causing disability, Maori adults were only half as likely as non-Maori (18% cf 38%) to use hearing aids or other assistive devices. The difference was not quite as marked for children, with 7.5% of Maori children and 9.7% of non-Maori children with hearing loss causing disability using hearing aids or other technology.

The patchy nature of settlement of Pacific Islanders (with high concentrations in Auckland and parts of Wellington, and very low concentrations elsewhere), make this population difficult to assess nationally. Pacific people were “over-sampled” in the 2001/2 study. The overall prevalence of hearing disability was estimated at 2.7%, but numbers were not high enough to enable valid age breakdowns.

Socio-economic factors

The analysis provided by the 2001/2 census is somewhat different in orientation to the earlier studies.

Of all people living in households with known occupations, 5% had a hearing loss causing disability (3% had hearing loss as their main disability). Hearing disability was more common among certain occupations, notably trades workers, workers in elementary occupations and plant & machine operators & assemblers.

Occupation	Hearing disability	Hearing disability main disability
Trades workers	16,100 11.1%	13,000 8.9%
Elementary occupations	12,500 12.4%	7,700 7.7%
Technicians & associate professionals	9,600 5.0%	5,900 3.1%
Plant & machine operators & assemblers	9,100 6.3%	6,400 4.4%
Professionals	7,600 3.2%	4,800 2.0%
Service & sales workers	6,300 2.6%	3,900 1.6%
Legislators, administrators & managers	6,000 2.8%	4,600 2.1%
Clerks	5,700 2.6%	3,500 1.6%
Other	4,000 4.2%	1,800 1.9%
Agriculture & fishery workers	3,300 2.4	1,700 1.2%
Total	80,300 4.6%	53,200 3.0%

Table IX: Occupational groups with estimated numbers and prevalence for adults with hearing loss causing disability, and those where hearing loss is their main disability (2001/2)

The sectors of the economy with highest prevalence of hearing disability (see Table X) were construction and manufacturing.

Industry	Hearing disability	Hearing disability main disability
Manufacturing	14,400 6.4%	10,000 4.4%
Construction	11,500 11.1%	8,400 8.1%
Property & business services	7,300 3.8%	5,200 2.7%
Education	6,100 4.8%	4,000 3.1%
Agriculture, forestry & fishing	5,400 3.8%	3,400 2.4%
Retail trade	5,000 2.4%	3,900 1.9%
Health & community services	4,700 3.3%	3,100 2.2%
Wholesale trade	3,900 3.9%	1,800 1.8%
Govt admin & defence	3,000 5.0%	2,600 4.3%
Transport & storage	2,500 3.8%	1,700 2.6%
Finance & insurance	1,900 3.7%	
Accommodation, cafes & restaurants	1,700 2.1%	

Table X: Industry with estimated numbers and prevalence of adults with hearing loss causing disability, and those where hearing loss is their main disability (2001/2)

The percentage of adults with a hearing disability participating in the workforce (defined as either employed or unemployed but seeking work) remained constant on 41% between the censuses of 1996 and 2001. This is considerably lower than the 67% of the total adult population participating in the workforce. In 2001, 7,400 adults with hearing loss causing disability were unemployed – a prevalence of 5.3% for hearing disability among the unemployed population.

People (both adults and children) with a hearing disability were the least likely disability group to receive a disability allowance or an invalid's benefit. Table XI lists income source for people with a hearing disability.

52% of people with a hearing disability had a Community Services Card (40% of people with hearing disability as their main disability).

48% of adults with hearing disability (41% where the main disability was a hearing disability) had a personal income below \$15,000, compared with 43% of the total adult population. 67% had a personal income below \$20,000, compared with 52% of the total population. 54% of adults with hearing disability (49% where the main disability was a hearing disability) had a household income below \$50,000.

Income source	Hearing disability	Hearing disability main disability
NZ Superannuation or Veteran's Pension	27,200 6.5%	11,200 2.7%
Interest, dividends, rent etc	17,600 2.5%	9,000 1.3%
Wages, salary	14,600 1.0%	7,000 0.5%
Self-employment	7,000 1.5%	4,100 0.9%
Invalids benefit	5,800 8.9%	1,700 2.6%
Other superannuation	4,800 5.4%	1,600 1.8%
Community wage – job seeker	3,300 1.8%	1,500 0.8%
DPB	2,800 2.6%	
Sickness benefit	2,700 5.0%	
Regular payments ex ACC or insurance	2,300 5.2%	

Table XI: Income source with estimated numbers and prevalence for adults with hearing disability, and with hearing disability as their main disability.

73,500 people (44%) with later hearing disability left school with no formal qualification, compared with 24% of the total population. This difference would be at least in part due to the older mean age of the population with hearing disability. A further 47,300 (28%) of those with hearing disability listed a school qualification as their highest educational achievement, compared with 34% of the total population.

Residential care

The relative prevalence of hearing loss for people in residential care compared with people living in households is available from the 2001/2 survey (see Table XII). It should be noted that residential care refers to people residing in rest homes and similar institutions – it does not include for example jail populations.

Household survey	Hearing disability	Prevalence (%)
Children (0-14) with all degrees of hearing disability	18,300	2.2
Adults (15+) with hearing impairment	210,400	
Adults (15+) deaf [†]	2,100	
Total Adults	212,500	7.5
Total	230,800	6.3
Residential survey	Hearing disability	Prevalence (%)
Adults (15+) – with hearing impairment	5,050	18.0
Adults (15+) deaf [†]	6,050	21.5
Total	11,000	39.1
Overall	Hearing disability	Prevalence (%)
Total	241,800	6.5

Table XII: *Estimated numbers and prevalence of people with hearing disability from within households, and in residential care (2001/2 study).*

[†] Inability to hear one other person talking

It should be noted that the figures underestimate the true prevalence of hearing loss since they comprise only those considered to have *uncorrected* hearing loss.

39% of men and 41% of women in residential care had hearing disability. These rates are dramatically higher than for adults living in households (men: 7.5% and women: 5.2%)

For 1900 people (17% of the total with hearing loss; 6.8% of the total residential care population) hearing loss was their main disability.

Of the people in residential care where hearing loss was their main disability, 55% had a severe disability.

42% of the people in residential care where hearing loss was their main disability had been in residential care for less than 2 years.

4,000 people in residential care (36% of people with hearing loss) had hearing aids or other assistive equipment. Women in residential care were more likely (39%) than men (29%) to be using hearing aids or assistive listening devices.

Multiple handicaps

In the 2001 study, the presence of multiple handicaps can be inferred when the hearing loss is specified as other than the main disability. The breakdown between hearing disability as a main or additional disability is shown in Figure 5. Unsurprisingly, there were more likely to be additional disabilities with increasing age.

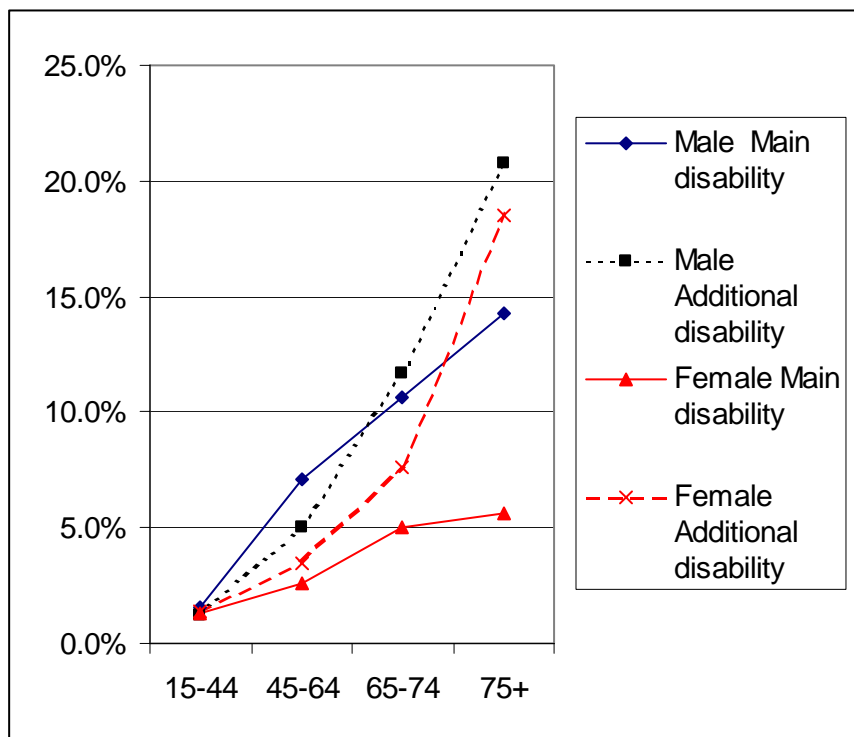


Figure 5: Prevalence of hearing loss as the main disability, and as an additional disability for adults living in households (2001/2)

For adults living in residential care, 1900 of the total of 11,000 (17%) named hearing as their main disability. The corollary of this is that at least 9,000 people in residential care have hearing disability in addition to other disability/ies.

Cause of hearing disability

From the 2001 household & residential surveys, data are available on the perceived cause of the hearing loss.

Cause of Hearing Disability	15-44	45-64	65+	Adults in households	Adults in residential care
Disease or illness	9,200	16,800	23,600	49,600	3,400
Accident or injury	11,100	22,100	19,600	52,800	800
Congenital	8,600	4,300	2,200	15,000	300
Ageing		6,400	20,200	27,500	5,300
Other or Unknown	13,300	26,900	27,300	67,600	1,200
Total	43,000	76,500	93,000	212,500	11,000

Table XIII. Cause of hearing disability for adults in the household survey (2001).

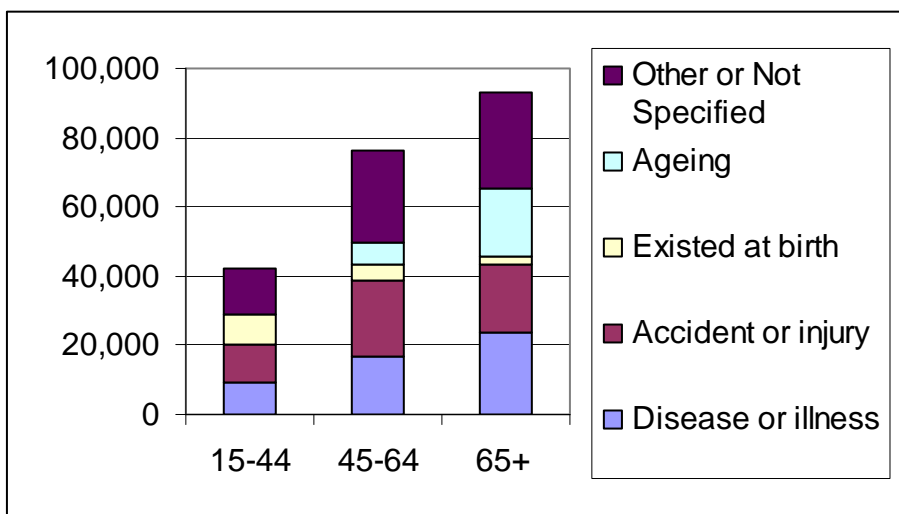


Figure 6: Cause of hearing disability for different age groups or people living in households (2001/2)

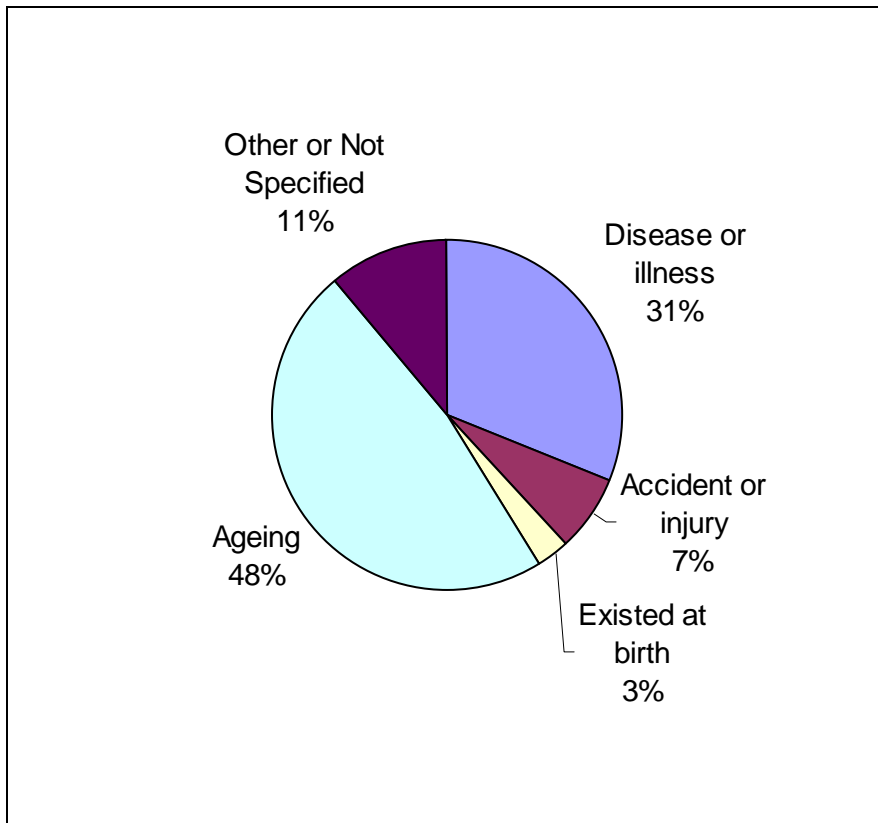


Figure 7. Cause of hearing disability in adults living in residential facilities (2001/2).

Use of hearing aids & other equipment

Because the 2001 study excluded people with hearing loss considered to be corrected, the numbers following need to be considered underestimates

Use of hearing aids and other equipment	Adults in households	Adults in residential care
Hearing aids	61,300 28%	3,700 34%
Amplified telephones	20,900 10%	
Teletext	6,700 3%	
Fax machines	3,500 2%	
Flashing alarms	3,000 1%	
Loop, FM or infra-red systems	2,500 1%	
Computers to communicate	2,000 1%	

Table XIV: *Use of devices & services by adults with hearing disability.*

Note that these categories are not mutually exclusive.

34,500 people with hearing loss indicated that they needed but did not have hearing aids. An estimated 5,000 people had unmet needs for an amplified telephone. Men with hearing disability (24%) were more likely than women (18%) to report unmet needs for hearing equipment or services. Affordability was the most common reason for these unmet needs – this being the case for an estimated 23,000 people (67%).

The proportion of people with hearing disability using hearing aids or other equipment or services increased with age (see Table XV & Figure 8).

Age group	Hearing aids	No special equipment
15-24	-	5,900 83%
25-44	1,900 5%	28,500 79%
45-64	13,700 18%	57,100 75%
65-74	15,000 36%	24,500 59%
75-84	18,000 53%	15,600 44%
85+	9,700 63%	5,300 35%

Table XV: Age and use of hearing aids for people with hearing disability living in households.

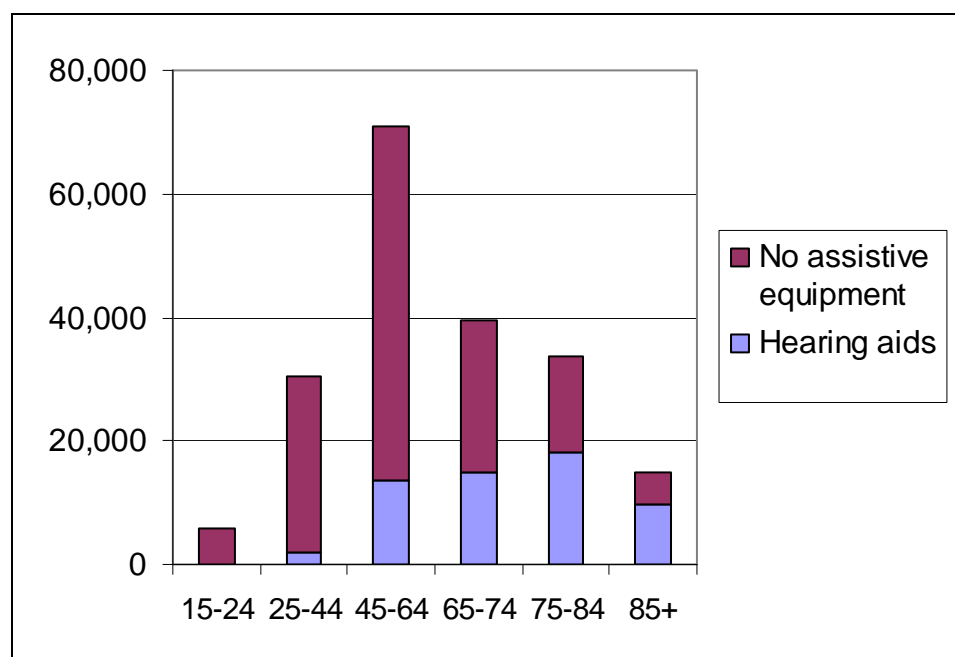


Figure 8: Age and use of equipment by people with hearing disability living in households.

Gender and use of equipment	Hearing aids	No special equipment
Males living in households	38,500 31%	76,500 62%
Females living in households	22,800 25%	60,400 67%
Adults (15+ years) living in households	61,300 28%	136,900 64%
Adults (15+ years) living in residential care	3,700 34%	7,040 64%
Children	1,600 9%	16,700 91%
Total	66,600 29%	160,000 66%

Table XVI: Gender & use of equipment for people with hearing disability.

For people living in residential facilities, 800 men and 2,800 women used hearing aids. 2,400 men and 4,700 women living in residential facilities with hearing disability used no assistive devices or services. It is noteworthy that the proportion of hearing aid use in this population is about half of that (for the same age groups) among people with hearing disability living in households.

51,000 people with hearing disability could lip-read. Younger adults with hearing loss were more likely to be able to lip-read than were older people. 36% of the 25-44 years age-group could lip-read, compared with 10% of people 85 years of age or older.

An estimated 6,900 people use NZ sign language. A further 2,400 use signed English. Numbers using sign language interpreters were too small to estimate.

Of children living in households, 1,600 (or 9% of children with hearing loss) were estimated to use hearing aids.

Conclusions

Prevalence rates are consistent with those obtained elsewhere where larger sample sizes have been available.

The small sample sizes in the census studies thus far completed limit the amount of valid analysis that can be carried out on issues such as ethnicity. Regional data would not be available without a major increase in sample size.

There is a need to work on reliable and valid questions to improve the quality of census data relating to hearing loss in the future. Certainly, it is clear that the use of a precursor question on age-related disability is inappropriate for hearing impaired people, and that a direct question of whether the person suffers from hearing loss as in the NZ 1991/92 survey and in the American Vital Statistics series gives a more accurate picture of the hearing impaired population.

This inadequacy is particularly obvious in the area of assessing numbers of people using hearing aids and other devices. It would be helpful to have a reliable estimate of the numbers of people using hearing aids, but the current data exclude all but children whose hearing disability is considered to be “corrected” by the use of hearing aids.

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