

Impact of Visual Impairment on Use of Community Support Services by Elderly Persons: The Blue Mountains Eye Study

Jie Jin Wang,¹ Paul Mitchell,¹ Wayne Smith,³ Robert G. Cumming,² and Karin Attebo¹

PURPOSE. To estimate the impact of visual impairment in older Australians on the use of community support services.

METHODS. In the Blue Mountains Eye Study, 3654 people aged 49 or older were examined—82.4% of eligible residents in an area west of Sydney, Australia. Presenting and best-corrected visual acuities were measured using a LogMAR chart. Subjects were categorized as having visual impairment if their better eye read 40 or fewer letters (20/40 or worse). Interview data included marital and other socioeconomic status measures, living status (alone or with spouse or other person), use of community support services, reliance on regular help from nonspouse family members or friends, and perceived ability to go out alone.

RESULTS. After adjusting for age, gender, education, living status, walking disability, and health-related factors, for each one-line (five-letter) decrease in best-corrected visual acuity, there was a corresponding increase in reliance on community support services (odds ratio [OR], 1.17; 95% confidence interval, [CI] 1.07-1.28) or combined community and family support (OR 1.22; 95% CI, 1.12-1.32). Visually impaired persons were three times as likely to use regular support services provided by the municipality (OR 3.1; 95% CI, 1.8-5.1). A similar increased reliance on regular help from community, nonspouse family members, or friends was found. Visually impaired persons were also much more likely to state that they thought they were unable to go out alone (OR 6.2; 95% CI, 2.6-14.3). The findings were similar when presenting visual acuity was used to define visual impairment or after subjects with walking disabilities were excluded. Visual impairment seemed to have a greater effect on use of community support services in women than in men.

CONCLUSIONS. After adjustment was made for confounding factors, visual impairment was found to affect significantly and negatively the independence of elderly people, particularly older women. Presenting visual acuity closely approximated best-corrected visual acuity in its impact on the use of community support services. (*Invest Ophthalmol Vis Sci.* 1999;40:12-19)

Visual impairment in elderly persons is of increasing importance because of changes in life expectancy. A dramatic age-related increase in the prevalence of visual impairment has been clearly shown in many recent population-based eye surveys, including the Baltimore Eye Survey¹; the Beaver Dam Eye Study²; Salisbury Eye Evaluation (SEE) Project³; a study conducted in three U.S. communities⁴; and two recent Australian studies, the Melbourne Visual Impairment Project^{5,6} and Blue Mountains Eye Study.⁷ In all studies, a sharp increase in prevalence was found, particularly from the age of 75 years onward.

Decreased ability to perform daily living activities by elderly people with visual impairment has been shown in most⁸⁻¹⁴ but not all¹⁵ studies in which this issue has been examined. Various methods have been used, with the potential for measurement error in some studies that assessed the level of visual impairment from self-report^{8,15} or from proxy questions about a previous diagnosis of eye disease.⁹

Carabellese et al.¹⁰ reported that visual and auditory impairment were significantly and independently associated with decreased self-sufficiency in daily living activities. In a prospective study, Salive et al.¹¹ found that participants with severe visual impairment had a three times higher odds of incidence of mobility and activity of daily living limitations than persons with visual acuity of 20/40 or better. Dargent-Molina et al.¹³ also found that women with low visual acuity or contrast sensitivity were significantly more likely to be physically dependent than were women with good vision.

The SEE Project¹⁴ recently assessed the impact of visual impairment on functional status in people aged 65 to 84 years and resident in Salisbury, Maryland. A number of previously validated questionnaire instruments were used, including activities of daily living, instrumental activities of daily living, and activities of daily vision scales. The investigators found that a

From the Departments of ¹Ophthalmology and ²Public Health and Community Medicine, University of Sydney; and the ³National Centre for Epidemiology and Population Health, Australian National University, Canberra.

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Reprint requests: Paul Mitchell, Department of Ophthalmology, the University of Sydney, Eye Clinic, Westmead Hospital, Hawkesbury Road, Westmead, NSW, Australia 2145.

binocular presenting visual acuity worse than 20/40 had an impact on all self-reported measures of functional status. Visual impairment was also one of the most important predictors of reporting nonattendance at social or religious activities.

Although visual impairment in elderly persons has been found to contribute to a reduced ability to live independently, the contribution of visual impairment to use of either community support services or regular help from relatives and family members has not been considered in detail. An increased need for community or family support could be a contributing factor in determining whether a person is placed in a nursing home or hostel. Recent evidence from the Beaver Dam Eye Study¹⁶ and Blue Mountains Eye Study¹⁷ has shown a disproportionately high rate of severe visual impairment and blindness in nursing home residents.

Estimates of the impact of visual impairment on dependency measures in older people would be useful in estimating the community cost of visual impairment. Our purpose in this study was to assess the impact of visual impairment on use of community support services and other measures of dependence in a representative sample of older Australians, taking into account the effects of visually impaired people living alone and the presence of other physical disabilities and health conditions. A further important purpose was to compare the impact of visual impairment whether defined by best-corrected visual acuity or by the person's habitual refractive correction or presenting visual acuity.

METHODS

The Blue Mountains Eye Study is a population-based survey of vision and common eye diseases in residents of a defined area west of Sydney, Australia. Prevalence of visual impairment and common age-related eye diseases in this population has been described previously.^{7,17-20} The area has a stable population that is representative of Australia in ethnicity and measures of socioeconomic status²¹ but is older compared with the New South Wales state average. The study was approved by the Western Sydney Area Human Ethics Committee and written, informed consent was obtained from all participants. This research was conducted according to the recommendations of the Declaration of Helsinki. After a door-to-door census, all permanent residents with birth date before January 1, 1943, were invited to attend a detailed eye examination at a local clinic. Of 4433 eligible persons, 3654 (82.4%) participated from 1992 through 1994.

Subjects were asked whether they owned their home, were renting, or living in a relative's home and whether they lived alone, with a spouse, or with other persons. They were also asked about sources of income and whether they received a government social security pension. Education was assessed by recording the attainment of a trade certificate or any higher qualifications, using the Australian Bureau of Statistics Classification of Occupations.²² For each participant, occupational prestige was assessed from the person's principal occupation using the Daniel Occupational Prestige Scale.²³ For scores below or equal to 4, occupational prestige was categorized as high, otherwise it was categorized as low. Scores in this population ranged from 1.4 to 6.7. Walking difficulty or the use of a cane, walker, or wheelchair was assessed by one of the examiners during the examination and categorized as walking

disability. History of health factors and self-rated health status were recorded using a standard questionnaire. Presence of diabetes was defined by medical history or elevation of fasting blood glucose (≥ 7.8 mmol/L).

The municipal council for the region provides several support services for elderly citizens, including a daily midday hot meal on weekdays at nominal charge (termed Meals-on-Wheels); home help in cleaning, meal preparation, and shopping (termed Home Care); and regular home visits by a community nurse, daily or at other frequencies, depending on need. The latter two services require a recommendation from the person's general practitioner or a regional hospital aged care assessment team. These initiatives receive federal or state health funding and are designed to keep people in their homes for as long as possible. Use of these services and dependence on family members or others to perform routine household activities were assessed by asking all participants a series of direct questions, which included the following:

What is your marital status?

Who lives with you?

Do you get regular help at home from Meals-on-Wheels?

Do you get regular home help (Home Care)?

Do you have regular home visits from a community nurse?

Who usually cleans your house?

Who usually does your shopping?

Are you able to go out alone (to shop, visit someone, or go to town)?

We defined use or dependence on community support services as the regular use of Meals-on-Wheels or Home Care, or regular home visits by a community nurse. We defined reliance on regular help from nonspouse family members or friends to exclude the regular paid employment of persons who performed house cleaning or other household activities.

At the clinic visit, presenting visual acuity was measured on a logMAR chart, while the subject was wearing currently prescribed distance glasses correction. Best-corrected visual acuity was then measured after a subjective refraction, as described previously.^{7,24} For each eye, visual acuity was recorded as the number of letters read correctly from 0 (acuity $< 20/200$) to 70 (20/10). Visual impairment levels were defined using presenting or best-corrected visual acuity in the better eye and followed the same criteria as was used in the Beaver Dam Eye Study.² No visual impairment was defined as Snellen equivalent better than 20/40 (41-70 letters read correctly). Mild visual impairment was defined as visual acuity 20/40 to 20/60 (26-40 letters read correctly) and moderate or severe visual impairment as visual acuity 20/80 or worse (0-25 letters read correctly). Visual impairment in this report refers to mild or worse levels of impairment.

Statistical analyses included a *t*-test for comparison of mean ages, chi-square statistic for comparison of social and demographic characteristics, Mantel-Haenszel test for trend, and logistic regression models to estimate the impact of visual impairment on use of community or family support (dependent variables) while adjusting for other factors. Visual acuity (continuous) or visual impairment (dichotomous) were the explanatory variables. Because socioeconomic status could substantially affect use of community support services, multivariate models were adjusted for age, gender, and the follow-

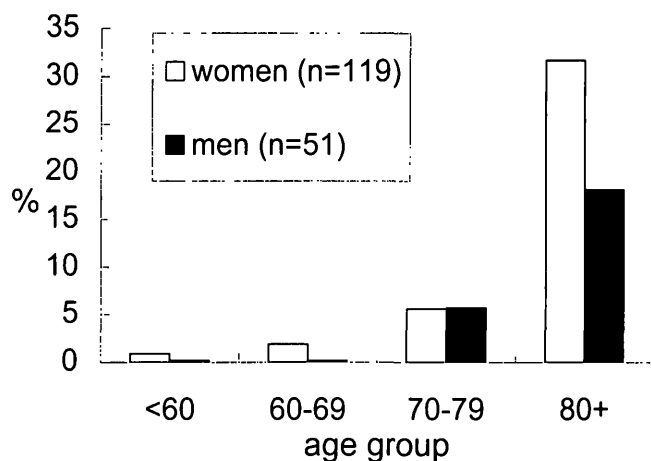


FIGURE 1. Prevalence of visual impairment in women and men by age group in the Blue Mountains Eye Study population ($n = 3647$).

ing potential confounding factors: education, occupational prestige, home ownership, pension status, living status, and walking disability. Because education, occupational prestige, home ownership, and pension status were found to be strongly cross-correlated, only one of these factors (education) was used in the multivariate initial model, which included age, gender, education, living status, and walking disability. In addition, health-related factors found to be significantly associated with use of support services were added to form a larger model. Analyses were repeated separately for men and women, for people living alone and those living with a spouse or other person, and before and after excluding persons with a walking disability. Odds ratios and 95% confidence intervals (CI) are presented.

RESULTS

Visual Impairment

In the study population, 170 (4.7%) of 3647 participants who had best-corrected visual acuity measured were classified as having visual impairment.⁷ Included were 51 men (3.2%) and 119 women (5.8%). One hundred twenty-five participants had mild, and 45 had moderate or severe visual impairment. The age and gender distributions of visual impairment defined using best-corrected visual acuity are shown in Figure 1. Visual impairment was significantly more frequent in women than men when this measure of impairment was used.⁷ A strong age-related trend in prevalence was evident, with visual impairment found in 0.6% of persons aged less than 60 years, 1.2% of persons aged 60 to 69 years, 5.6% of persons aged 70 to 79 years, and 26.2% of persons aged 80 years or more (chi-square for trend; $P = 0.001$). Visual impairment, when defined using presenting visual acuity, was more frequent being present in 509 (14.0%) of 3647 participants, including 199 men (12.6%) and 310 women (15.0%). This measure of visual impairment had a similar age-related trend, from a rate of 4.5% among persons aged less than 60 years, to 8.1% of persons aged 60 to 69 years, 19.1% of persons aged 70 to 79 years, and 48.1% of persons aged 80 years or older (chi-square for trend; $P = 0.001$).

Social and Demographic Variables

Social and demographic characteristics were compared between participants with and without visual impairment, using presenting and best-corrected visual acuity measurements (Table 1). Participants with visual impairment were significantly older and were more likely to be female, widowed, and receiving a government social security pension. Compared with women without visual impairment, those with visual impairment were significantly less likely to have greater education and occupational prestige, but were more likely to be living alone. These measures, however, were not significantly different between visually impaired and unimpaired men. There were few differences in the impact of visual impairment on social and demographic characteristics between subjects defined by presenting rather than best-corrected visual acuity, apart from this group of subjects being younger and less likely to be female.

Use of Community Support Services

Use of community support services, including Meals-on-Wheels, Home Care or community nursing visits was reported by 186 participants (5.4%), including 124 women (6.3%) and 62 men (4.3%). This difference between men and women was not statistically significant after adjusting for age. The use of services in women and men in each age group is shown in Figure 2, with a marked increase evident in the use of services by persons aged 80 years or more.

Visual Impairment and Use of Community or Family Support

After adjusting for age, gender, education, living status, and walking disability for each five-letter (one-line) decrease in best-corrected visual acuity (Table 2A), there was a statistically significant increase in the use of one or more community support services assessed (ORs, 1.08–1.29). The odds for use of any community support services or reliance on regular help from nonspouse family members or friends increased by 1.25 (95% CI 1.16–1.34), whereas the odds for inability to go out alone increased by 1.29 (95% CI 1.17–1.42) for each line decrease in best-corrected visual acuity. After further adjustment for health-related factors (history of stroke, arthritis, cancer, presence of diabetes, falls in the past year, and self-rated poor health) in addition to factors in the initial model, these associations were unchanged (Table 2). For each five-letter decrease in presenting visual acuity, estimates that were similar but of a slightly lower magnitude, were found for all outcomes assessed (Table 2B).

Use of community support services was reported by 45 of 158 persons (28.5%) with visual impairment and 141 of 3290 persons (4.3%) without visual impairment, defined using best-corrected visual acuity (Table 3A). After adjustment for age, gender, education, living status, walking disability, and other health-related factors, persons with visual impairment were consistently more likely than those without visual impairment to use any community support services (OR 3.1; CI 1.8–5.1). This difference between visually impaired and unimpaired persons was greatest in regular visits by a community nurse (OR 5.1; CI 2.3–11.1). Visually impaired persons were also more than twice as likely to rely on community support or help from nonspouse family members or friends for cleaning and shopping (OR 2.5; CI 1.5–4.1). They were also much more likely to state that they thought themselves unable to go out alone (OR

TABLE 1. Social and Demographic Characteristics of Subjects with and without Visual Impairment

Factor	Visual Impairment (n = 170)	No Visual Impairment (n = 3394)	P by Chi-Square
Men and women			
Mean age (years)	79.6 (74.6)*	65.5 (64.8)	0.001 (0.001)
Women (%)	70.0 (60.9)	56.1 (56.0)	0.001 (0.039)
Qualifications (%)†	30.6 (37.1)	48.4 (49.2)	0.001 (0.001)
Main job prestige (%)‡	44.0 (52.3)	62.5 (63.2)	0.001 (0.001)
Home ownership (%)	84.1 (84.4)	88.8 (89.3)	0.063 (0.002)
Pensioner (%)	89.0 (80.6)	57.2 (55.1)	0.001 (0.001)
Living alone (%)	41.9 (42.2)	26.6 (24.9)	0.001 (0.001)
Marital status (%)			
Never married	8.3 (9.5)	7.6 (7.4)	0.001 (0.001)
Now married	36.3 (44.0)	64.2 (65.9)	
Separated/divorced	4.8 (9.3)	11.7 (11.7)	
Widowed	50.6 (37.2)	16.6 (15.0)	
Women only			
Mean age (years)	79.5 (75.3)	65.6 (64.8)	0.001 (0.001)
Qualifications (%)†	23.5 (30.0)	43.1 (44.0)	0.001 (0.001)
Main job prestige (%)‡	36.2 (41.3)	53.9 (54.9)	0.001 (0.001)
Home ownership (%)	84.4 (81.1)	87.6 (88.5)	0.310 (0.001)
Pensioner (%)	88.8 (84.3)	63.4 (61.4)	0.001 (0.001)
Living alone (%)	52.1 (52.1)	34.5 (32.6)	0.001 (0.001)
Marital status (%)			
Never married	10.2 (12.1)	8.0 (7.4)	0.001 (0.001)
Now married	23.7 (30.0)	53.7 (55.8)	
Separated/divorced	5.9 (9.5)	14.1 (14.4)	
Widowed	60.2 (48.5)	24.2 (22.4)	
Men only			
Mean age (years)	79.8 (73.5)	65.4 (64.8)	0.001 (0.001)
Qualifications (%)†	47.1 (48.2)	55.1 (55.8)	0.256 (0.045)
Main job prestige (%)‡	62.0 (69.4)	73.5 (73.7)	0.071 (0.206)
Home ownership (%)	83.3 (89.6)	90.3 (90.2)	0.110 (0.794)
Pensioner (%)	89.6 (74.7)	49.4 (47.2)	0.001 (0.001)
Living alone (%)	18.0 (26.9)	16.6 (15.1)	0.787 (0.001)
Marital status (%)			
Never married	4.0 (5.6)	7.2 (7.3)	0.001 (0.001)
Now married	66.0 (65.7)	77.5 (78.8)	
Separated/divorced	2.0 (9.1)	8.6 (8.3)	
Widowed	28.0 (19.7)	6.8 (5.7)	

* Data are based on best-corrected visual acuity in the better eye, with presenting visual acuity in parentheses.

† Trade certificate or higher qualification.

‡ Prestige scale 4.0 or higher.

6.2; CI 2.6-14.3). These statistically significant associations were similar when visual impairment was defined using presenting visual acuity (Table 3B), with slightly reduced odds for most measures, apart from use of Meals-on-Wheels, which had higher odds.

Separate analyses were performed in women and men. The impact of visual impairment, defined using best-corrected visual acuity, on the use of any community support services seemed to be greater in women (OR 3.8; CI 2.2-6.7) than in men (OR 1.2; CI 0.5-3.3) in the initial multivariate model adjusting for age, gender, education, living status, and walking disability. When we further adjusted for health-related factors in the larger model, the gender difference remained (Table 4). Overall, fewer men in the population reported that they thought themselves unable to go out alone (1.3%) than women (2.9%). Men and women strongly associated visual impairment with this problem, with higher odds in men (OR 10.3; CI

1.3-83.7) than in women (OR 5.2; CI 2.0-13.6; Table 4). These gender differences persisted when using presenting rather than best-corrected visual acuity to define visual impairment (Table 4).

In the Blue Mountains Eye Study population, 988 (27.3%) persons, including 728 (35.5%) women and 260 (16.6%) men, reported that they lived alone. After multivariate adjustment in the larger model, the impact of visual impairment on use of community support services or reliance on help from non-spouse family members or friends was similar in people who lived alone and in those living with their spouses or other persons, apart from the use of community nursing services. Compared with unimpaired subjects, those with visual impairment (defined using best-corrected visual acuity) who lived with their spouses or other persons had higher odds for use of community nursing (OR 7.4; CI 2.5-22.1) than did visually impaired persons living alone (OR 3.4; CI 1.1-11.1).

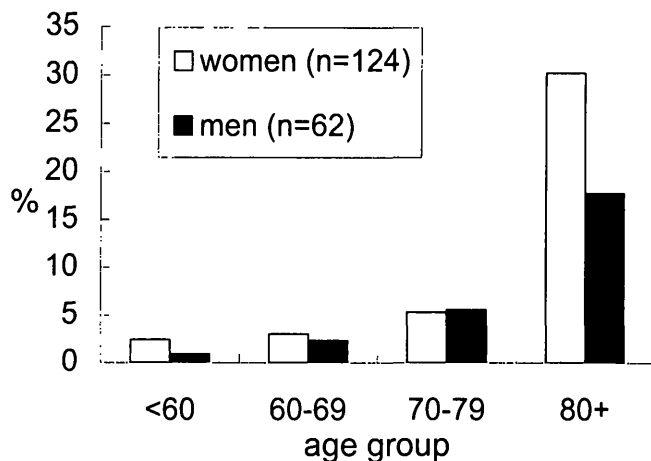


FIGURE 2. Use of community support services in women and men by age group in the Blue Mountains Eye Study population ($n = 3448$).

The presence of a walking disability was recorded by the examiner in 261 (7.2%) persons, including 166 (8.0%) women and 95 (6.0%) men. When persons with a walking disability were excluded from the analysis, the contribution of visual impairment (defined using best-corrected visual acuity) to the use of any community support services (OR 2.8; CI 1.5-5.4) was similar to corresponding ORs for the whole population (OR 3.1; CI 1.8-5.1) in the larger multivariate model. The contribution of visual impairment to the need for community nursing was higher in people without a walking disability (OR 9.0; CI 3.2-25.3) than in the whole population (OR 5.1; CI 2.3-11.1).

DISCUSSION

In this population, visually impaired persons were significantly older and more likely to be female, widowed, and receiving a government social security pension than were persons without visual impairment. These social and demographic differences were similar whether best-corrected or presenting visual acuity was used to define visual impairment. The demographic characteristics of visually impaired subjects in our population were in close agreement with findings from a Canadian low-vision clinic report.²⁵

Our data suggest that visual impairment may increase the reliance on regular community support services two to three times and on regular help from nonspouse family members or friends by a similar increment. We had limited statistical power in our study to assess the impact of individual eye diseases on the use of services, and in many cases, more than one condition contributed to visual loss (for example, age-related maculopathy and cataract coexisted). An earlier report on our population indicated that age-related maculopathy was the principal cause of corrected moderate or severe visual impairment, and cataract was the principal cause of corrected mild visual impairment.⁷ The Canadian low-vision clinic investigators²⁵ also found that their older clients were most likely to have age-related maculopathy or cataract. Of note, our study has shown that presenting acuity deficits, of which a large proportion are caused by uncorrected refractive error, were associated with almost the same increased risk for use of services as were best-corrected acuity deficits, which are more likely to be caused by eye disease. This finding has implications for the provision and accessibility of refractive services.

TABLE 2. Best-Corrected and Presenting Visual Acuity and the Use of Community Support Services or Reliance on Help from Nonspouse Family Members or Friends

Support	Per Line Decrease in Letters Read Correctly	
	Initial Model*	Larger Model†
A. Best-corrected visual acuity		
Use of community support services		
Meals-on-Wheels	1.08 (0.98-1.20)	1.04 (0.92-1.19)
Home Care (home help)	1.13 (1.04-1.22)	1.12 (1.03-1.22)
Community nurse	1.15 (1.05-1.27)	1.22 (1.09-1.37)
Use of any community support services	1.18 (1.10-1.27)	1.17 (1.07-1.28)
Community or family support‡	1.25 (1.16-1.34)	1.22 (1.12-1.32)
Unable to go out alone	1.29 (1.17-1.42)	1.25 (1.10-1.40)
B. Presenting visual acuity		
Use of community support services		
Meals-on-Wheels	1.06 (0.96-1.17)	1.03 (0.91-1.17)
Home Care (home help)	1.09 (1.01-1.17)	1.08 (0.99-1.17)
Community nurse	1.11 (1.01-1.22)	1.14 (1.02-1.27)
Use of any community support services	1.09 (1.03-1.15)	1.07 (1.00-1.14)
Community or family support‡	1.10 (1.05-1.15)	1.08 (1.03-1.14)
Unable to go out alone	1.28 (1.16-1.41)	1.23 (1.10-1.38)

Values are adjusted odds ratios, with 95% confidence intervals in parentheses.

* Adjusted for age, gender, education, living status, and walking disability.

† Further adjusted for history of stroke, arthritis, and cancer; presence of diabetes; falls occurring in the past year, and self-rated poor health.

‡ Use of community support services or reliance on regular help from nonspouse family members or friends for cleaning or shopping.

TABLE 3. Visual Impairment and the Use of Community Support Services or Reliance on Regular Help from Nonspouse Family Members or Friends

Support	Subjects Reliant on Support*		Adjusted Odds Ratios†
	Visual Impairment	No Visual Impairment	
A. Best-corrected visual acuity			
Use of community support services			
Meals-on-Wheels	15/154 (9.7)	37/3300 (1.1)	2.4 (1.0-6.1)
Home Care (home help)	37/158 (23.4)	110/3289 (3.3)	2.9 (1.7-5.0)
Community nurse	20/151 (13.3)	43/3279 (1.3)	5.1 (2.3-11.1)
Use of any community support services	45/158 (28.5)	141/3290 (4.3)	3.1 (1.8-5.1)
Community or family support‡	59/150 (39.3)	224/3203 (7.0)	2.5 (1.5-4.1)
Unable to go out alone	26/124 (21.0)	27/2313 (1.2)	6.2 (2.6-14.3)
B. Presenting visual acuity			
Use of community support services			
Meals-on-Wheels	31/472 (6.6)	21/2982 (0.7)	2.8 (1.3-5.8)
Home Care (home help)	67/479 (14.0)	80/2968 (2.7)	2.3 (1.5-3.5)
Community nurse	33/467 (7.1)	30/2963 (1.0)	2.9 (1.6-5.6)
Use of any community support services	87/480 (18.1)	99/2968 (3.3)	2.7 (1.8-4.0)
Community or family support‡	113/465 (24.3)	170/2888 (5.9)	2.1 (1.5-2.9)
Unable to go out alone	38/379 (10.0)	15/2058 (0.7)	5.4 (2.5-11.7)

CI, confidence interval.

* Values are number of subjects, with percentage in parentheses.

† Adjusted for age, gender, education, living status, and walking disability; history of stroke, arthritis, and cancer; presence of diabetes; falls occurring in the past year; and self-rated poor health, with 95% CI in parentheses.

‡ Use of community support services or reliance on regular help from nonspouse family members or friends for cleaning or shopping.

Despite the different outcome measures used, the estimates of increased dependence among people with visual impairment in our study are similar to estimates from the

recently reported SEE project, which used standardized activities of daily living and instrumental activities of daily living surveys to measure functional status.¹⁴ Reliance on community

TABLE 4. Visual Impairment, Defined Using Best-Corrected and Presenting Visual Acuity, and Reliance on Support among Women and Men Separately

Support	Multivariate-Adjusted Odds Ratios*	
	Best-Corrected Visual Acuity	Presenting Visual Acuity
Women (n = 2068)		
Use of community support services		
Meals-on-Wheels	3.6 (1.2-10.9)	3.7 (1.3-10.5)
Home Care (home help)	4.9 (2.6-9.2)	3.4 (2.0-5.8)
Community nurse	6.3 (2.4-16.5)	4.4 (1.8-10.6)
Use of any community support services	4.2 (2.3-7.7)	2.0 (1.3-3.1)
Community or family support†	3.2 (1.8-5.7)	2.2 (1.5-3.1)
Unable to go out alone	5.2 (2.0-13.6)	4.4 (1.7-11.1)
Men (n = 1579)		
Use of community support services		
Meals-on-Wheels	1.4 (0.1-14.6)	1.5 (0.4-5.3)
Home Care (home help)	0.4 (0.1-2.3)	1.0 (0.4-2.3)
Community nurse	4.1 (1.0-17.3)	2.4 (0.8-6.8)
Use of any community support services	1.8 (0.6-5.3)	1.6 (0.9-2.8)
Community or family support†	1.4 (0.5-3.9)	1.0 (0.7-1.5)
Unable to go out alone	10.3 (1.3-83.7)	7.0 (1.4-35.5)

CI, confidence interval.

* Adjusted for age, gender, education, living status, and walking disability; history of stroke, arthritis, and cancer; presence of diabetes; falls occurring in the past year, and self-rated poor health, with 95% CI in parentheses.

† Use of community support services or reliance on regular help from nonspouse family members or friends for cleaning or shopping.

support services or regular assistance from nonspouse family members or friends was assessed in our study by asking a few short, direct questions. Because of these differences in method, our study findings cannot be compared directly to the SEE Project findings.¹⁴

Measurement of visual acuity and definitions of visual impairment have varied widely among studies,⁸⁻¹⁵ which also limits direct comparison of the findings. We measured presenting visual acuity (wearing current glasses, if worn) and best-corrected visual acuity after a standardized, subjective refraction. Visual impairment was defined in our study using both these visual acuity measures, with a substantially higher (almost threefold) prevalence of visual impairment found when presenting acuity was used. However, the impact of visual impairment on use of services was similar with only slightly stronger associations found when best-corrected acuity was used to define visual impairment. Presenting acuity thus closely approximated best-corrected visual acuity in its impact on the use of community support services.

Age is the most important variable predicting the decline in ability to perform daily living activities¹⁴ and increasing visual impairment.⁶ Gender (because of gender-role differences), other socioeconomic, or social demographic factors^{26,27} and health-related factors could also be associated with declining ability to perform daily living activities and with increasing visual impairment.^{6,28} It is therefore important in assessing the effect of visual impairment on use of community support services that appropriate control of such potential confounding factors be included. Multivariate adjustment in statistical models and subgroup stratification, as used in our study, are appropriate methods for this purpose.

In our study living status and walking disability seemed to be relatively independent of the impact of visual impairment on reliance on community or family support. In people living alone and those with a physical (walking) disability, visual impairment seemed to exert a lesser effect on the need for a community nurse than in people living with another person and without a walking disability. This could indicate that these two groups are already reliant on community nursing assistance, and visual impairment may therefore not have caused as much incremental impact.

Separate analyses of men and women controlling for age, education, living status, and walking disability suggested that visual impairment may have a greater effect on use of community services in women than men. In the larger multivariate model, the different impact persisted. The impact of visual impairment on use of any community support services was more than twice as high in women (OR 4.2) as in men (OR 1.8). This could not be explained by differences in mean age between visually impaired women and men (Table 1). However, although women had much higher rates of visual impairment, they were also much more likely to be living alone, which is likely to magnify the impact of visual impairment on daily living activities. Although we adjusted statistically in the model for living status, this adjustment may have been incomplete, so that we may have underestimated the impact of living alone. It is also possible that many visually impaired men are assisted by their spouses, whereas older visually impaired women may be more likely to need support. Many surviving unimpaired men may have a greater level of infirmity than their spouses because of their probable older age, or they may have no skills in cooking, cleaning, and shopping. Both partners

could thus become more dependent on support services as a result of visual impairment affecting the female spouse.

In the Longitudinal Study of Aging, women who had no disability in performing daily living activities at the baseline examination were consistently found to experience higher incidence rates of disability than were men for all six daily living activities measured, but experienced lower death rates over 6 years.²⁹ The SEE project also found that women were more likely to report difficulties in functional status than men.¹⁴ Our study broadly agrees with these findings. After adjusting for age, education, living status, physical disability, and health-related factors, the impact of visual impairment on use of support services or need for assistance in women was consistently greater than in men (Tables 4).

In conclusion, visual impairment (defined either using best-corrected or presenting visual acuity) was found to have a substantial impact on the use of community support services and reliance on regular help from nonspouse family members or friends in a population of older Australians. This caused a significant and negative impact on social functioning and independence. The impact persisted in a multivariate model after adjusting for age, gender, social demographic, and health-related factors and after stratifying by living status. Its effect was not diminished after excluding persons with a coexistent walking disability. This effect seemed to be greater in women than in men in this population.

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ANNOUNCEMENT

The I.U.S.G. Eye Foundation Award

The I.U.S.G. (International Uveitis Study Group) Eye Foundation is a non-profit organization established to promote and encourage teaching and research in the field of uveitis. The Foundation is issuing a call for nominations for the I.U.S.G. Award. This award will be presented every 2 years to ophthalmologists or basic researchers 40 years of age or less who have improved our understanding of uveitis, its basic mechanisms and its diagnostic and therapeutic approaches. Nominations should be sent before September 30, 1999 to Dr. E. Bloch-Michel, rue de Grenelle 168, F-75007 Paris, France. This should include a complete curriculum vitae, a photo, and a list of publications with copies of the 5 most important published papers on uveitis.