

Research Letter

The Importance of Visual Health—A Representative Population Survey

Almost ten million people in Germany have an eye disease that can potentially cause vision loss, such as age-related macular degeneration (AMD). Future prognosis show that these numbers will continue to rise as the population ages, for example by 15% for AMD by 2050 (1). On average, about 80% of all sensory experiences in humans are based on vision, and the special importance of vision as compared to other senses and diseases has been shown in various international studies.

We conducted a representative survey in order to understand the importance of such a widespread health challenge as the deterioration of vision and the factors that influence this perception in the German population.

Methods

From October 2020 to February 2021, data including sociodemographic information were collected as part of an ongoing representative population telephone survey (Kantar Health Germany) according to the guidelines of the Working Group of German Market and Social Research Institutes (*Arbeitskreis Deutscher Markt- und Forschungsinstitute*) (2). The main questions asked were about (see *Table 1*):

- the participant’s visual impairments;
- the participant’s assessment of blindness with respect to other serious diseases; and
- the participant’s assessment of blindness with respect to other sensory losses.

The target group was the German-speaking population aged ≥ 40 years in Germany. The data were evaluated descriptively and by means of regression analysis.

Results

A total of 10 869 participants were surveyed. About a quarter of the participants (24.1%) reported visual impairment despite wearing glasses or contact lenses (*Table 1*). The more visual impairment were reported, the older the participants were ( $p < 0.001$ ) and the lower the household income was (2% visual impairment at <3500 €/month, and 7.7% at <1500 €/month;  $p < 0.001$ ).

In a multivariable ordinal regression model, a lower likelihood of reporting visual impairment was associated with living in a multi-person household (odds ratio [OR]: 0.81; 95% confidence interval [0.72; 0.91]), being male (OR: 0.80; CI [0.73; 0.88]), being employed (OR: 0.84; CI [0.73; 0.97]), and having a higher educational qualification (OR: 0.85; CI [0.76; 0.96]).

The most feared health problems were cancer (25.4%), dementia (23.9%), stroke (17.6%), and blindness (10.8%). In households with an income of < 1 500 Euros, the fear of blindness was highest, at 19.8% ( $p < 0.01$ ). Similar to dementia and stroke, blindness was feared by older participants and by people living in single-person households or who reported visual impairment ( $p < 0.01$ ).

In the multi-variable, multinomial regression model, visual impairment was associated with a higher probability of reporting blindness as the most feared condition as compared to stroke, cancer, or dementia (*Table 2*). A below-average household income also increased the probability of blindness being perceived

to be the most feared disease with respect to cancer or dementia. Living in a multi-person household, on the other hand, reduced that probability.

In the survey, blindness was by far the most feared sensory loss, at 67.4% (*Table 1*). People who were older, had completed only elementary or secondary school, were not employed, lived in a single-person household, or were men were more likely to fear blindness more than any other sensory loss ( $p < 0.001$ ).

Discussion

In this representative population survey, almost 70% of the participants rated blindness as the worst possible sensory loss. The diseases that were the most feared were severe stroke, cancer, and dementia, followed by blindness, whereby the latter was rated as the most serious illness by every tenth respondent. Thus, good vision and the corresponding fear of vision loss are of considerable importance in the health perception of a large part of the German population aged ≥ 40 years.

Our study shows for the first time that in Germany, visual impairments are more common among respondents with low household incomes than in the population as a whole.

TABLE 1

Survey results

	All respondents	
<b>Total</b>	<b>10 869</b>	
<b>Question 1: Presence of visual impairment, n (%)</b>		
- No visual impairment	8034 (73.9)	
- Some visual impairment	2161 (19.9)	
- Major visual impairment	408 (3.8)	
- I cannot see at all	50 (0.5)	
- No response	216 (2.0)	
	All respondents	Respondents with visual impairment
<b>Total, n (%)</b>	<b>10 869</b>	<b>2619 (24.1 %)</b>
<b>Question 2: Most feared health problem, n (%)</b>		
- Stroke (e.g. with hemiplegia)	1913 (17.6)	457 (17.4)
- Cancer	2766 (25.4)	681 (25.7)
- Dementia	2602 (23.9)	609 (24.7)
- Blindness	1169 (10.8)	416 (15.9)
- Deafness	51 (0.5)	12 (0.5)
- Loss of an arm or leg	228 (2.1)	55 (2.1)
- HIV/AIDS	96 (0.9)	28 (1.1)
- None of these health problems	1067 (9.8)	181 (6.9)
- Not sure / no response	977 (9.0)	180 (6.9)
<b>Total, n (%)</b>	<b>10 868</b>	<b>2618</b>
<b>Question 3: Most feared sensory loss, n (%)</b>		
- Blindness	7326 (67.4)	1780 (68.0)
- Muteness	334 (3.1)	97 (3.7)
- Deafness	739 (6.8)	219 (8.4)
- Loss of balance	1025 (9.4)	236 (9.0)
- Loss of smell or taste	420 (3.9)	112 (4.3)
- Not sure	527 (4.9)	101 (3.9)
- No response	497 (4.6)	73 (2.8)

TABLE 2

**Dreaded diseases: associations in a multinomial regression model with the reference category blindness\*<sup>1</sup>**

	Stroke	Cancer	Dementia	Deafness	Loss of a limb	AIDS/HIV	No fears
	Odds ratio [95% confidence interval]						
Visual impairment* <sup>2</sup>	0.56* <sup>3</sup> [0.50; 0.71]	0.66* <sup>3</sup> [0.56; 0.78]	0.55* <sup>3</sup> [0.46; 0.65]	0.67 [0.33; 1.04]	0.83 [0.58; 1.19]	0.74 [0.45; 1.24]	0.40* <sup>3</sup> [0.32; 0.50]
Gender: male	1.14 [0.97; 1.33]	0.77* <sup>3</sup> [0.66; 0.90]	0.83* <sup>3</sup> [0.71; 0.97]	0.85 [0.46; 1.56]	1.45* <sup>3</sup> [1.04; 2.01]	1.32 [0.83; 2.09]	1.40* <sup>3</sup> [1.15; 1.70]
University entrance qualification* <sup>2</sup>	1.00 [0.82; 1.23]	1.04 [0.86; 1.25]	1.30* <sup>3</sup> [1.08; 1.57]	1.45 [0.74; 2.84]	0.79 [0.53; 1.19]	1.13 [0.65; 1.97]	1.23 [0.65; 1.97]
Net household income <2500 Euro* <sup>2</sup>	0.88 [0.73; 1.07]	0.74* <sup>3</sup> [0.62; 0.89]	0.60* <sup>3</sup> [0.50; 0.72]	0.75 [0.36; 1.56]	0.87 [0.59; 1.28]	1.44 [0.84; 2.46]	0.95 [0.75; 1.19]
Employed* <sup>2</sup>	1.47* <sup>3</sup> [1.16; 1.88]	1.05 [0.84; 1.32]	1.01 [0.80; 1.27]	1.67 [0.64; 4.35]	1.57 [0.95; 2.61]	0.35* <sup>3</sup> [0.19; 0.65]	0.85 [0.63; 1.29]
Multi-person household* <sup>2</sup>	1.48* <sup>3</sup> [1.16; 1.88]	2.32* <sup>3</sup> [1.92; 2.80]	1.59* <sup>3</sup> [1.32; 1.91]	1.95 [0.85; 4.49]	1.51 [1.00; 2.70]	2.49* <sup>3</sup> [1.38; 4.49]	1.30* <sup>3</sup> [1.04; 1.63]
Additional year of life (age)	1.03* <sup>3</sup> [1.02; 1.03]	0.98* <sup>3</sup> [0.98; 0.99]	1.02* <sup>3</sup> [1.01; 1.03]	1.00 [0.96; 1.05]	0.98 [0.96; 1.00]	0.94* <sup>3</sup> [0.91; 0.96]	1.01* <sup>3</sup> [1.00; 1.02]

n = 7957 (at least one entry was missing for 2912 of these)

Odds ratio <1 indicates that if this characteristic is present (for instance, visual impairment), the respective disease (for instance, stroke) is feared less than blindness.

\*<sup>1</sup> Reference category blindness (Nagelkerke r<sup>2</sup> = 0.099); \*<sup>2</sup> Dichotomized independent variables; \*<sup>3</sup> p < 0.05

This confirms results from various industrialized countries that have reported blindness and visual impairment to be inversely related to higher incomes (3). This reflects, among other things, that vision loss requires significant support—financial and/or family. For example, informal support from family members is the most important resource for the blind and partially sighted in Germany (4).

The strengths of our study include its representativeness and large sample as well as the collection of socio-demographic data that have either not been collected or only sparsely collected in comparable studies. The limitations of the study include the pre-given response options, a certain bias due to self-selection by the participants, and the lack of objectification of the reported visual impairments. However, the latter is unproblematic, as self-reported visual impairments correlate very well with objectifiable functional impairments (5).

In summary, the study impressively shows that, for the general population, vision and visual health are very important. Given the rapid increase in age-related eye diseases that can potentially impair vision, this importance should be reflected in health and science policy agendas.

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Prof. Holz is a board member of DOG, an executive board member of Euretina, member of the Scientific and Medical Advisory Board of Pro Retina Deutschland. The remaining authors declare that no conflict of interest exists.

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