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Age- and sex-stratified prevalence of physical disabilities and handicap in the general population

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ABSTRACT. ***Background and aims:*** *Our aim was to provide age- and sex-stratified prevalence estimates of physical disabilities and handicap in the general Belgian population.* ***Methods:*** *A cross-sectional and demographically representative health interview survey was conducted nationwide in Belgium in 1997. The 8836 persons aged 15 years and over who answered the health interview were included in this study. Seventeen items from the survey encompassing main activities of daily living (ADL) and confining were analyzed. To provide prevalence estimates as detailed as possible, neither aggregation nor dichotomization were applied.* ***Results:*** *Women consistently reported more disability than men: mobility ($p<0.001$), transfer in-out bed ($p<0.001$), transfer in-out chair ($p<0.001$), dressing ($p=0.004$), washing hands and face ($p=0.029$), getting to and using toilet ($p=0.003$), continence ($p<0.001$), seeing ($p<0.001$) and mastication ($p<0.001$). As expected, there was a marked trend for increased prevalence of disability with increasing age for both sexes. Moderate disability arose mainly from the 25-34 age group for both sexes. For both genders, severe disability appeared mainly at higher ages, particularly for the 65-74 age group. Nevertheless, the data suggest that continence problems for women, mobility and transfer issues for men, as well as mastication problems for both genders, clearly emerge earlier than age 65. Regarding handicap, observed prevalence rates were increasing, in age as was the case for disability, but no differences were found between men or women, except for confinement to house/garden, for which women presented a higher rate in general ($p<0.001$) and in the 75-84 age group ($p=0.036$) in particular.* ***Conclusions:*** *This study shows the wide range of disability types in the general population and their association with handicap. While elderly individuals consistently report higher degrees of disability and handicap, attention should also be paid to younger age groups. Disability calls for wide, coherent and relevant medical as well as social responses.*

(Aging Clin Exp Res 2004; 16: 389-397)

INTRODUCTION

The population is aging inexorably in many parts of the world, notably in Western societies (1). As life expectancy extends, individuals develop greater susceptibility to limitations in the ability to perform activities of daily living (ADL). Nowadays, the question of interest no longer seems to be how long individuals will live, but how well they will age.

The International Classification of Impairments, Disabilities and Handicaps (ICIDH) was developed by the World Health Organization. It frames, in a consistent classification system, the concepts pertaining to functional ability (2, 3). Impairment is related to an individual's biomedical status and represents "any loss or abnormality of psychological, physiological or anatomical structure or function". Disability is concerned with limitations in performing ADL "in the manner or within the range considered as normal for a human life". Handicap refers to the social consequences of impairments and disabilities which limit the "fulfillment of a role that is normal, depending on age, sex and social and cultural factors" for an individual.

Physical limitations are of major concern for public health authorities because they are associated with loss of

Key words: Disability, handicap, National Health Interview Survey, public health.

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dependence, increased needs of health care, and cost inflation. Age is the strongest predictor of physical limitations, and hence disability amongst the elderly population has been the focus of numerous studies (4-8). However, systematically to consider elderly people as the disabled segment of the population is potentially misleading. In this line of thought, it would be worth trying to evaluate the level of prevalence and severity of disabilities in the general population. Knowledge of age- and sex- prevalence estimates constitutes the first step towards an efficient public health strategy.

Very few nationally representative datasets embracing the ICIDH at all ages have been published regarding levels of functional limitations. The purpose of this study is to provide age- and sex-stratified prevalence estimates of physical disabilities and handicap in the general population.

METHODS

Data source

This study is based on a broad cross-sectional National Health Interview Survey (HIS) conducted in Belgium during the year 1997, consisting of a nationwide representative sample of the population. Households were randomly selected from the national register (which includes persons in institutions) and were contacted according to a rigorous selection protocol to make the data as representative as possible of the national demography in terms of age, gender and geographic distribution (9, 10). A letter of invitation and an information leaflet on the survey were sent to all identified individuals. The letter also asked for their permission to conduct an oral interview at home. Once consent had been obtained from households, a specifically trained interviewer made arrangements with participants to conduct a one-hour face-to-face health interview in the home. All data are thus self-reported and were gathered at the participant's home in front of an interviewer. To make sure that selected respondents were able to answer, a preliminary test asking for their age, date of birth and address was performed. In case of cognitive or physical disability, a proxy was identified.

Procedures

The survey, containing a large range of questions embracing major domains of health, included a module specifically dedicated to long-term physical limitations in ADL. Three dichotomous items encompassed handicap by asking respondents if they were confined to bed or in a chair, even if someone could help them get up and walk. The third item asked if they were confined to their home/garden. Physical disability was assessed through 14 items embracing 11 physical functions, including mobility assessed by walking distance and transfer from/to bed or chair, dressing, self-care, eating, toilet use, urinary continence, hearing, seeing, and mastication. For each physical disability item, the scoring scheme enabled us to determine a degree of severity. For interpretability and clarity, these items and their corresponding scoring scheme are listed in the appendix.

The long-term physical limitation items applied to participants above 15 years of age. When participants were under the age of 60, if they reported no limitation among the 10 items of the SF-36 Physical Functioning scale (11) previously administered in the survey, they were no longer questioned on handicap and on the 9 first disability items. The interview then directly moved on to the hearing, seeing and mastication items. When respondents were above the age of 60, they were asked to answer all items, regardless of their SF-36 Physical functioning score.

Statistical analysis

Analysis was based upon the 17 items related to physical limitations (14 disability items, 3 handicap items). Age- (10-year age groups) and sex-specific prevalence rates were calculated for each item (degree of confining, severity of disability). To provide estimates as detailed as possible, neither aggregation nor dichotomization were applied. Within each disability and handicap domain, prevalence rates are mutually exclusive. 95% confidence intervals (CI) were computed to check for the significance and amplitude of the prevalence rates. Differences between men and women were assessed with the Chi-square test, as appropriate (12).

RESULTS

Study population

In all, 11,568 Belgian households were invited to take part in the survey; 7967 were successfully contacted and 3601 were not reached. Of those contacted, 4664 agreed to participate (58.5%). The survey included 10,221 individuals (about 0.1% of the whole Belgian population). Of these, 8836 (86.4%) were over the age of 15 and were retained for analysis. The demographics of the study population are presented in Table 1. The sample is typically representative of Belgian demography (age, sex, regional distribution) as recorded by the census.

For 622 individuals, responses were obtained from proxies (408 individuals were unreachable, 96 refused to answer directly, and 118 were unable to answer). Of the 118 unable to answer, 8 did not pass the preliminary test, 23 were unable to answer themselves, 22 were seriously mentally disabled, and 65 invoked miscellaneous reasons. The response rates to disability questions ranged from 80.0% for hearing for men aged 15-24, up to 100% for mastication and seeing for men aged 85+. Regarding handicap questions, response rates ranged from 83.4% for men aged 65-74 up to 95.8% for men aged 45-54.

Table 1 - *Characteristics of interviewed individuals over the age of 15.*

	Age groups								Total
	15-24	**25-34**	**35-44**	**45-54**	**55-64**	**65-74**	**75-84**	**85 +**	
N	1317	1678	1637	1311	1106	1093	535	159	8836
Woman (%)	50.9	50.7	48.9	48.7	51.5	54.8	58.1	70.4	51.0
Marital status (%)									
Married	13.5	66.6	75.4	74.8	77.7	67.1	45.4	11.3	49.8
Divorced	0.6	4.9	11.2	14.6	10.1	5.3	3.0	3.8	6.1
Widowed	0.2	0.4	0.6	2.7	6.6	21.9	44.1	76.7	6.7
Single	85.7	28.1	12.8	8.0	5.6	5.8	7.5	8.2	37.3
Household size (%)									
1 person	8.7	15.0	11.8	15.1	16.5	26.4	45.4	71.7	14.7
2 persons	13.3	23.6	13.3	29.1	59.0	59.7	45.0	18.2	26.2
3 persons	20.5	28.5	22.5	24.0	16.6	10.3	5.9	7.5	20.2
4 persons	33.6	24.3	36.4	22.8	6.3	2.5	2.6	1.3	25.1
5 persons or more	23.9	8.6	16.0	9.0	1.6	1.1	1.1	1.3	13.8
Education (%)									
No diploma	3.3	1.7	1.7	1.9	2.6	4.2	2.8	5.1	2.5
Primary	11.5	6.0	8.9	12.6	19.2	29.8	34.2	46.8	13.9
Lower secondary	16.7	12.0	15.4	19.4	24.3	21.7	22.3	21.5	17.2
Higher secondary	34.5	34.1	32.1	29.8	28.5	23.7	19.5	14.6	30.5
Higher	34.1	46.3	41.9	36.2	25.5	20.6	21.2	12.0	35.9

Prevalence of physical disabilities

Figures 1 and 2 display the distribution of disability types among men and women in general. Mastication was the most disabled function in both genders (women: 19.9%; men: 15.8%), followed by mobility (women: 9.8%; men: 5.9%) and hearing (women: 7.1%; men 8.2%). Except for feeding, cutting up food, and hearing, in which no significant differences were observed, women consistently reported more disability than men: mobility ($p<0.001$), transfer in-out bed ($p<0.001$), transfer in-out chair ($p<0.001$), dressing ($p=0.004$), washing hands and face ($p=0.029$), getting to and using toilet ($p=0.003$), continence ($p<0.001$), seeing ($p<0.001$) and mastication ($p<0.001$).

Tables 2 and 3 present detailed prevalence estimates by age and sex groups. As expected, there was a marked trend for increased prevalence of disability with increased age in both sexes.

Moderate disability arose mainly from the 25-34 category for both sexes, with prevalence rates ranging from 0.6 to 4.1%. Moderate hearing and sight disability were present at all ages in both sexes.

Severe disabilities appeared mainly at higher ages, particularly for the groups of men and women aged 65-74. Nevertheless, continence problems for women, mobility and transfer issues for men, and mastication problems for both sexes clearly emerged prior to age 65.

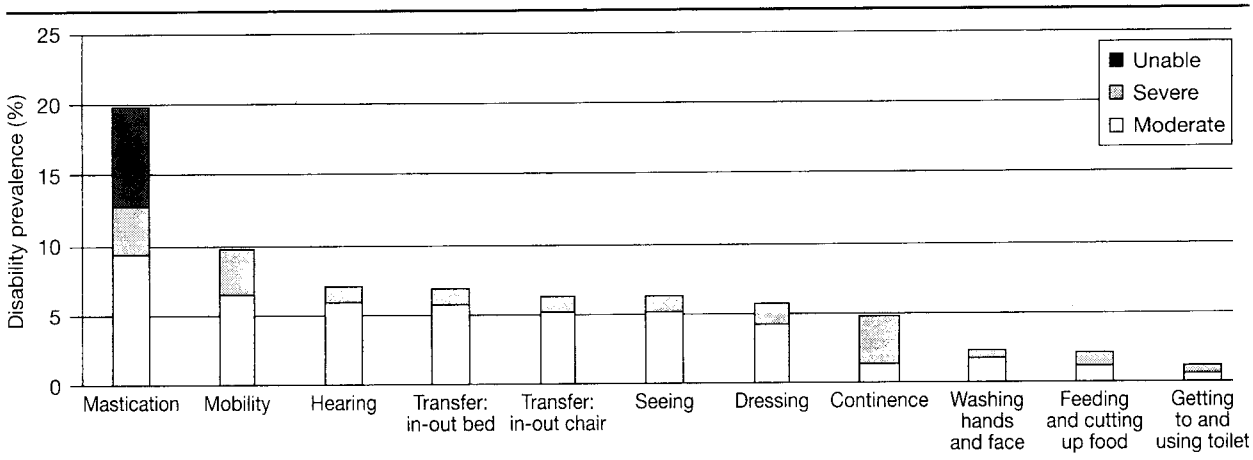

Figure 1 - *Prevalence of disability in women over the age of 15 years.*

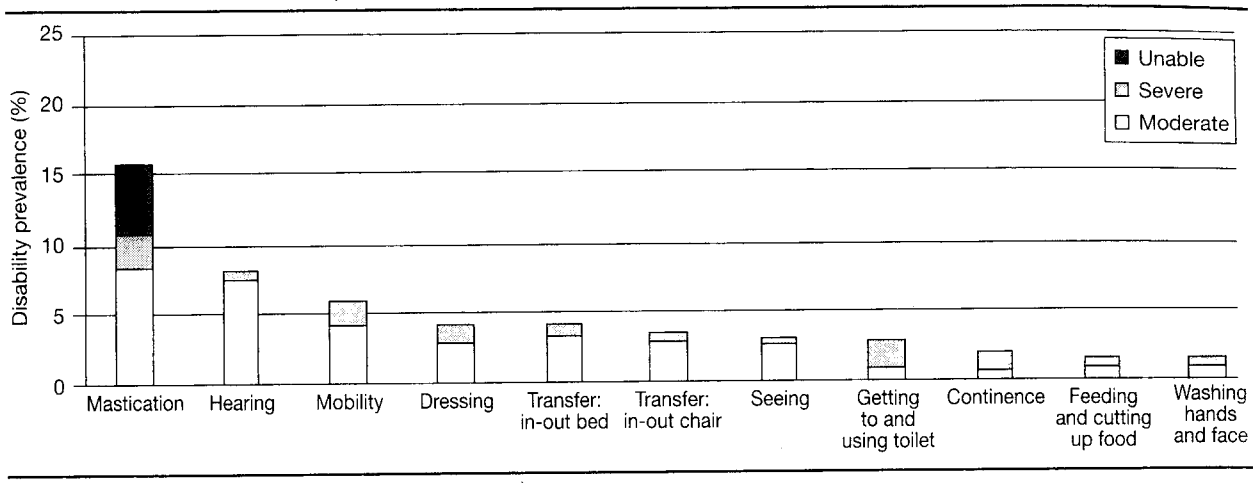

Figure 2 - *Prevalence of disability in men over the age of 15 years.*

As illustrated in Figures 1 and 2 and detailed in Tables 2 and 3, women consistently declared higher prevalence of disability in each function. Differences were above all significant for those aged 75-84: mobility ($p<0.001$), transfer in-out bed ($p=0.011$), transfer in-out chair ($p=0.016$) and seeing ($p=0.016$). Differences were less pronounced for younger age groups. However, significant differences were noted for continence in individuals aged 35-44 ($p=0.01$), 45-54 ($p=0.027$) and 65-74 ($p=0.003$), as well as for transfer in-out bed in individuals aged 45-54 ($p=0.015$) and seeing in those aged 35-44 ($p=0.012$). Remarkably, hearing was the only function for which men reported more disability than women in those aged 55-64 ($p=0.008$) and 65-74 ($p=0.039$).

Prevalence of handicap

Table 4 shows prevalence estimates for handicap. As in disability, prevalence rates increased with age. No differences were found between men and women, except for confinement to house/garden, for which women related a higher rate in general ($p<0.001$) and in the 75-84 age group ($p=0.036$) in particular.

DISCUSSION

This analysis provided further insights into the prevalence of physical disabilities and handicap in the general population. Up to now, there have been very few published data regarding prevalence estimates of physical disability and handicap, especially representative demographic data. Mastication, mobility and hearing are by far the most disabled functions in the population. It should be borne in mind that, among the 7967 households successfully contacted, 3303 (41.5%) refused to participate. Older age and lower educational attainment certainly constitute two important causes for refusal. As these two factors also represent two main determinants of disability, the estimates reported in the current study are probably conservative.

This prevalence study uses a comprehensive set of disability items, exploring a large array of physical functions: upper and lower limb function, continence, hearing, seeing, and mastication. These measures of limitation in a variety of physical and sensory functions may be less susceptible to environmental and sociocultural factors (13). In addition, they are scored in such a way that a degree of severity can be assessed. Instead, the three handicap items may appear too narrow in scope. They only focus on confining, whereas many other factors may be taken into account to address the social consequences of impairments and disabilities. For instance, the handicap items employed in this study did not allude to work or leisure limitations in daily living.

The results confirm the increasing prevalence of handicap and disability with age. The physical limitations of the elderly have been extensively studied (4-8) and debated as a major public health issue (13-15). In France (Paris area), among persons above the age of 70 years and living at home, the prevalence of physical care and mobility disabilities attained 58 and 51%, respectively (16). In a Spanish community-dwelling of sample people, aged 65 and over, the prevalence of functional limitations (difficulty in performing upper and lower limb movements) was 20.6% (6). In addition, 46.2% were disabled in at least one instrumental ADL (needing assistance to carry out any of 10 instrumental ADL) and 15.5% were disabled in ADL (needing assistance in seven basic ADL). Among residents over the age of 65 from a North London electoral ward, Harwood et al. (5) reported that locomotion disability was the most prevalent: 22 and 18% were mildly and severely disabled, respec-

Table 2 - *Prevalence of physical disabilities in women by age groups in % (95% CI).*

	Age groups							
	15-24	**25-34**	**35-44**	**45-54**	**55-64**	**65-74**	**75-84**	**85+**
Mobility								
Moderate	1.1 (0.4-1.8)	1.1 (0.4-1.8)	1.9 (0.9-2.8)	4.1 (2.5-5.7)	7.8 (5.4-10.2)	15.1 (12.1-18.1)	27.7 (22.4-32.9)	24.3 (16.2-32.4)
Severe	-	-	-	-	1.4 (0.4-2.5)	7.8 (5.6-10.1)	14.5 (10.4-18.7)	31.8 (23.0-40.6)
Transfer: in-out bed								
Moderate	-	1.2 (0.5-2.0)	1.9 (0.9-2.8)	4.6 (2.9-6.3)	4.9 (3.0-6.9)	12.6 (9.8-15.4)	19.0 (14.5-23.6)	31.8 (23.0-40.6)
Severe	-	-	-	-	-	2.2 (1.0-3.5)	6.0 (3.2-8.7)	10.3 (4.5-16.0)
Transfer: in-out chair								
Moderate	-	0.9 (0.2-1.5)	1.2 (0.4-2.0)	3.0 (1.7-4.4)	5.4 (3.4-7.4)	13.0 (10.1-15.8)	18.3 (13.8-22.8)	33.6 (24.7-42.6)
Severe	-	-	-	-	-	2.0 (0.8-3.2)	4.6 (2.1-7.0)	6.5 (1.9-11.2)
Dressing								
Moderate	-	0.6 (0.1-1.2)	1.5 (0.6-2.3)	2.2 (1.0-3.4)	3.5 (1.9-5.1)	8.9 (6.5-11.3)	17.7 (13.2-22.1)	31.8 (23.0-40.6)
Severe	-	-	-	-	-	2.6 (1.3-3.9)	7.1 (4.1-10.1)	11.2 (5.2-17.2)
Washing hands and face								
Moderate	-	-	-	0.8 (0.1-1.6)	1.2 (0.3-2.2)	3.9 (2.3-5.5)	7.0 (4.1-10.0)	14.0 (7.4-20.6)
Severe	-	-	-	-	-	1.1 (0.2-2.0)	3.9 (1.6-6.1)	8.4 (3.2-13.7)
Feeding and cutting up food								
Moderate	-	-	-	-	1.0 (0.1-1.9)	2.8 (1.4-4.2)	6.0 (3.2-8.7)	12.1 (6.0-18.3)
Severe	-	-	-	-	-	1.9 (0.7-3.0)	4.2 (1.9-6.6)	11.2 (5.2-17.2)
Getting to and using toilet								
Moderate	-	-	-	-	1.2 (0.3-2.2)	3.3 (1.8-4.8)	7.7 (4.6-10.9)	20.6 (12.9-28.2)
Severe	-	-	-	-	-	1.5 (0.5-2.5)	3.9 (1.6-6.1)	5.6 (1.2-10.0)
Continence								
Moderate	-	-	-	1.0 (0.2-1.8)	1.2 (0.3-2.2)	3.3 (1.8-4.9)	6.0 (3.3-8.8)	5.7 (1.3-10.1)
Severe	-	0.6 (0.1-1.2)	1.1 (0.3-1.8)	2.0 (0.9-3.2)	4.1 (2.4-5.9)	9.1 (6.7-11.5)	9.2 (5.8-12.6)	17.9 (10.6-25.2)
Hearing								
Moderate	1.2 (0.3-2.1)	1.4 (0.6-2.2)	3.3 (2.0-4.5)	3.6 (2.1-5.1)	6.5 (4.4-8.5)	9.8 (7.4-12.2)	20.5 (15.9-25.1)	37.7 (28.5-47.0)
Severe	-	-	-	1.3 (0.4-2.2)	-	1.7 (0.7-2.8)	3.4 (1.3-5.4)	8.5 (3.2-13.8)
Seeing								
Moderate	3.3 (1.9-4.8)	2.7 (1.6-3.9)	3.5 (2.2-4.8)	4.9 (3.2-6.6)	5.1 (3.3-7.0)	6.2 (4.2-8.1)	12.0 (8.3-15.7)	21.2 (29.0-13.3)
Severe	-	-	-	0.8 (0.1-1.5)	-	1.7 (0.7-2.8)	3.0 (1.1-4.9)	7.7 (2.6-12.8)
Mastication								
Moderate	-	4.1 (2.7-5.5)	5.4 (3.8-7.0)	7.3 (5.3-9.4)	14.5 (11.5-17.4)	19.7 (16.4-22.9)	22.1 (17.4-26.8)	15.0 (8.2-21.7)
Severe	-	-	0.9 (0.2-1.6)	1.8 (0.7-2.8)	3.8 (2.2-5.5)	8.7 (6.4-11.0)	10.9 (7.4-14.4)	19.6 (12.1-27.2)
Unable	-	1.2 (0.5-2.0)	1.8 (0.9-2.8)	4.9 (3.2-6.6)	7.7 (5.5-9.9)	15.4 (12.5-18.3)	24.1 (19.3-28.9)	35.5 (26.4-44.6)

Only significant rates according to 95% CI are presented.

tively. After locomotion, the most prevalent physical disabilities were hearing (21%), reaching and stretching (13%), personal care (13%), continence (13%), seeing (11%), dexterity (8%) and eating/digestion (1%).

Using data from the third National Health and Nutrition Examination Survey (NHANES III) among persons aged 60 years and older, Ostchega et al. (17) reported a significant trend for increased prevalence of disability with increased age in both men and women. Women reported more disability than men in all age groups (60-69, 70-79, 80+) and the percentage difference by gender increased with age. For instance, 9.9% of men aged 60-69 reported difficulty in getting out of bed versus 12.6% of women in the same age group. This increased to 24.4% of men and 29.2% of women aged 80+. The most disabled function was stooping/crouching (men: 32.5% in 60-69 age group, 42.3% in 70-79 and 57.5% in 80+; women: 40.3% in 60-69, 54.9% in 70-79 and 70.3% in 80+). The less disabled function was feeding self (men: 2.4% in 60-69, 4.8% in 70-79 and 10.1% in 80+; women: 3.4% in 60-69, 5.3% in 70-79 and 11.6% in 80+).

In the face of the population aging process, forthcoming health and retirement policies must pay specific attention to the prevalence and patterns of physical limitations among the elderly (18, 19). Physical limitation assessments are therefore of prime importance to estimate service needs and to manage resources in the most efficient manner (20). Disability trends among elderly persons have tremendous social implications for the future ability of a society to care for its disabled elderly members (21-23).

Table 3 - *Prevalence of physical disabilities in men by age groups in % (95% CI).*

	Age groups							
	15-24	**25-34**	**35-44**	**45-54**	**55-64**	**65-74**	**75-84**	**85+**
Mobility								
Moderate	-	0.9 (0.2-1.6)	1.3 (0.5-2.1)	1.9 (0.8-2.9)	6.4 (4.1-8.7)	15.2 (11.7-18.6)	15.0 (10.1-19.9)	29.5 (16.1-43.0)
Severe	-	0.6 (0.1-1.2)	-	0.9 (0.2-1.7)	-	6.1 (3.8-8.4)	5.0 (2.0-8.0)	15.9 (5.1-26.7)
Transfer: in-out bed								
Moderate	-	1.0 (0.3-1.7)	1.5 (0.7-2.4)	1.7 (0.7-2.7)	3.5 (1.8-5.2)	10.0 (7.1-12.9)	11.5 (7.1-15.9)	31.1 (17.6-44.6)
Severe	-	-	-	-	1.3 (0.3-2.4)	2.4 (0.9-3.9)	2.5 (0.3-4.7)	8.9 (0.6-17.2)
Transfer: in-out chair								
Moderate	-	1.0 (0.1-1.7)	1.1 (0.4-1.9)	1.4 (0.5-2.3)	3.3 (1.7-5.0)	9.5 (6.7-12.4)	11.5 (7.1-15.9)	27.3 (14.1-40.4)
Severe	-	-	-	-	1.3 (0.3-2.4)	1.7 (0.5-3.0)	-	-
Dressing								
Moderate	-	0.6 (0.1-1.2)	1.1 (0.4-1.9)	2.0 (0.9-3.1)	4.0 (2.2-5.8)	7.6 (5.0-10.1)	13.0 (8.3-17.7)	28.9 (15.6-42.1)
Severe	-	-	-	-	-	3.7 (1.8-5.5)	4.0 (1.3-6.7)	15.6 (0.5-26.1)
Washing hands and face								
Moderate	-	-	-	-	-	3.9 (2.0-5.8)	4.0 (1.3-6.7)	22.2 (10.1-34.4)
Severe	-	-	-	-	-	1.7 (0.5-3.0)	2.0 (0.1-3.9)	-
Feeding and cutting up food								
Moderate	-	-	-	-	-	2.7 (1.1-4.2)	7.0 (3.5-10.5)	20.0 (8.3-31.7)
Severe	-	-	-	-	-	1.7 (0.5-3.0)	-	-
Getting to and using toilet								
Moderate	-	-	-	-	-	2.9 (1.3-4.6)	5.5 (2.3-8.7)	13.3 (3.4-23.3)
Severe	-	-	-	-	-	1.5 (0.3-2.6)	-	-
Continence								
Moderate	-	-	-	-	-	1.7 (0.5-3.0)	2.0 (0.1-4.0)	-
Severe	-	-	-	-	2.0 (0.7-3.3)	4.2 (2.2-6.1)	8.6 (4.7-12.6)	13.6 (3.5-23.8)
Hearing								
Moderate	1.2 (0.2-2.1)	2.2 (1.2-3.2)	3.9 (2.6-5.3)	7.0 (5.1-9.0)	11.7 (8.9-14.4)	14.9 (11.7-18.0)	24.4 (18.8-30.1)	33.3 (19.6-47.1)
Severe	-	-	-	-	-	1.5 (0.4-2.5)	-	11.1 (1.9-20.3)
Seeing								
Moderate	2.1 (0.9-3.3)	1.4 (0.6-2.3)	1.9 (0.9-2.8)	2.8 (1.5-4.1)	2.9 (1.4-4.3)	4.2 (2.4-6.0)	4.9 (2.1-7.8)	8.5 (0.5-16.5)
Severe	-	-	-	-	-	-	2.2 (0.3-4.2)	-
Mastication								
Moderate	-	2.7 (1.6-3.9)	4.4 (3.0-5.9)	8.5 (6.3-10.6)	14.6 (11.6-17.7)	17.9 (14.4-21.3)	19.3 (14.1-24.5)	31.9 (18.6-45.2)
Severe	-	-	-	2.0 (0.9-3.1)	3.2 (1.7-4.7)	6.9 (4.7-9.2)	9.9 (6.0-13.8)	10.6 (1.8-19.5)
Unable	-	-	1.5 (0.7-2.4)	3.1 (1.8-4.5)	8.0 (5.7-10.3)	13.9 (10.8-17.0)	19.3 (14.1-24.5)	31.9 (18.6-45.2)

Only significant rates according to 95% CI are presented.

Several studies report trends estimates of disability among the elderly, especially in the United States. Using the National Long Term Care Survey (NLTCS), Manton et al. (24) showed that the age-specific prevalence rates for ADL impaired or institutionalized persons declined from 1982 to 1994 in the 75-84 age group from 24.7 to 21.4% and in the 85+ age group from 57.3 to 52.7%. Schoeni et al. (25) compared disability trends among several health surveys conducted between 1982 and 1996 in the United States. For those aged 70 years and older, the National Health Interview Survey (NHIS) showed a decrease in disability prevalence from 22.7% in 1982 to 19.3% in 1996. The Supplement on Aging (SOA) evidenced a decrease from 34.2% to 28.5% for disability in the lower body. For those aged 65 years and over, prevalence rates varied from 35.3% in 1992 to 32.6% in 1996 in the Medicare Current Beneficiary Survey (MCBS). An exception is the trend found in the Longitudinal Survey on Aging (LSOA), in which disability prevalence varied from 18.8% in 1984 to 20.5% in 1990 (25, 7). Nevertheless, Crimmins et al. (7) suggest that both NHIS and LSOA show some fluctuations, rather than a clear trend, in the prevalence of disability. Based on the Survey of Income and Program Participation (SIPP), Freedman et al. (26) also observed a decrease in disability level between 1984 and 1993 for those aged 50 years and older (seeing: from 15.3% to 11.6%, lifting and carrying: from 23.5% to 18.9%, climbing: from 24.5% to 22.0%, walking: from 25.8% to 22.3%).

More recently, Winblad et al. (27) compared the prevalence of disability at the age of 75 and over among three birth cohorts [those born ≤1903 (data collected in 1979), those born ≤ 1913 (1989) and those born ≤ 1923 (1999)] from two rural municipalities in Finland. As in the current study, female sex and older age were associated with a higher level of disability. The prevalence of disability decreased, rates being 29.0% for

Table 4 - *Prevalence of handicap in women and men by age groups in % (95% CI).*

	Age groups							
	15-24	**25-34**	**35-44**	**45-54**	**55-64**	**65-74**	**75-84**	**85+**
Women								
Confined to house/garden	-	0.6 (0.1-1.2)	1.5 (0.6-2.3)	2.0 (0.9-3.2)	3.7 (2.0-5.4)	10.2 (7.6-12.8)	16.5 (12.2-20.8)	26.2 (17.8-34.5)
Confined to chair	-	-	-	-	1.0 (0.1-1.9)	3.5 (2.0-5.1)	7.7 (4.6-10.8)	16.8 (9.7-23.9)
Confined to bed	-	-	-	-	-	1.3 (0.3-2.3)	2.5 (0.7-4.3)	-
Men								
Confined to house/garden	-	-	0.8 (0.2-1.4)	2.0 (0.9-3.1)	1.8 (0.6-3.0)	6.1 (3.8-8.4)	10.5 (6.3-14.7)	22.2 (10.1-34.4)
Confined to chair	-	-	-	0.8 (0.1-1.5)	1.5 (0.4-2.7)	4.6 (2.6-6.6)	7.5 (3.8-11.2)	11.1 (1.9-20.3)
Confined to bed	-	-	-	-	-	1.2 (0.2-2.3)	-	-

Only significant rates according to 95% CI are presented.

the first cohort, 34.8% for the second and 28.8% for the third. The authors observed a declining disability among women, although distributions in the three cohorts based on the numbers of ADL limitations did not differ, suggesting that there was no decreasing rate of disability in the total population.

Our findings show that women consistently report more disability than men. This has long been recognized in the elderly (17, 28, 29). Women have longer life expectancy and may consequently suffer from different chronic diseases resulting in functional limitations. Notwithstanding, in younger groups, women equally reported more disability. This may be due to the self-report nature of the survey. It has been demonstrated that women may over-report disability compared with men, whereas the latter may under-report disability (30).

Despite the fact that disability is irremediably related to age, it should not be neglected in the other segments of the population. This study shows that urinary continence, mastication, hearing and sight are seriously altered in younger age groups. However, only very limited data relating to the disability level of the general population are available. Barbotte et al. (31) recently reviewed the literature and noted that many studies dealt with disability rates in specific population groups. There were far fewer investigations from surveys conducted in the general population (country or region). The authors stated that prevalence of disability ranged between 3.6% in those aged 60 years and over in two areas of Zimbabwe (disability was defined by inability to perform any one of the ADL) and 66% in those aged 75 years and over (disability was defined as sleep disturbances).

The above authors also pointed out that disability and handicap were approached by many indicators. Physical limitation assessments are far from being systematically standardized to the point at which comparisons could readily be carried out. In addition, different surveys may address the same disability domain but ask questions in a slightly different manner. Such differences in survey design and wording may capture different health concepts. Furthermore, health system and sociocultural context may lead to differences in measurement due to potential differences in definitions, perceptions and types of responses implemented to address disability and handicap issues. Recent reports have highlighted the need for greater homogeneity in the taxonomy of health conditions (31) and argue in favor of standardization of indicators (13, 14).

In this study, we tabulated prevalence rates as detailed as possible according to age, gender and severity. As a result, global disability or handicap rates did not emerge from the analysis. Too often, disability is considered as a whole, and disabled people are considered as a homogeneous group, although they may differ substantially in the range and manner in which they experience disability. A great deal of information may be lost in aggregating a variety of heterogeneous indicators of disability into a single disability measure (14). The current report provides a wider range of types and severities of disability and handicap in the general population, as recommended (15).

Prevention or postponement of disability and handicap is a major concern for the modern health system. Disability and handicap are primarily caused by chronic disease, especially in older adults, in whom the occurrence of such disorders is frequent. Injury following accident may equally substantially contribute to disability. Naturally, we may be tempted to prevent physical limitations by preventing diseases or accidents. Studies that aim at investigating the pathway from disease to disability and handicap would unquestionably help to identify potential intervention strategies to prevent or delay disability onset. Nevertheless, with regard to the aged population, it should be borne in mind that disability is not always the result of disease processes, but may also be attributable to senescence itself in societies with increasing life expectancies (32, 33).

The Belgian HIS-1997 was the first nationally representative health survey in Belgium. Its cross-sectional nature does not allow us to project trend estimates. However, the second Belgian HIS was recently carried out, and future HIS are planned over the next decades. These additional data will make trend estimates into the future possible. Better knowledge about the evolution of prevalence estimates over time is necessary, to optimize public health strategies and to evaluate the effectiveness of potential policy implementations.

CONCLUSIONS

This study shows the wide variety in disability and handicap types among the general population. Whereas the elderly consistently report more disability and handicap, attention should also be paid to younger age groups. As life expectancy extends, disability is becoming an even more burdensome public health problem and should not be considered as a homogeneous problem requiring a single response. Instead, disability calls for wide, coherent and relevant medical as well as social responses.

APPENDIX

Physical disability items from the Belgian National Health Interview Survey – 1997.

Items	Answer choice	Scoring scheme
1. How far can you walk without stopping or being bothered?	1. Few steps only 2. Less than 200 meters 3. 200 meters and more	1: Severe 2: Moderate 3: Not disabled
2. Can you get out of bed and go to bed without aid? 3. Can you sit down and get up from chair without aid? 4. Can you get dressed and undressed without aid? 5. Can you wash your hands and face without aid? 6. Can you eat and cut up your food without aid? 7. Can you get to and use toilet without aid?	1. Yes, without difficulty 2. Yes, but with difficulty 3. No, I always need someone to help me	1: Not disabled 2: Moderate 3: Severe
8.a. Do you have difficulty in retaining urine? 8.b. If so, what is the frequency?	a: 1. Yes / 2. No b: 1. At least once a week 2. Less than once a week but at least once a month 3. Less than once a month	a.2: Not disabled a.1 + b.3: Not disabled a.1 + b.2: Moderate a.1 + b.1: Severe
9.a. Can you listen to TV with a sound volume acceptable for other people? 9.b. If not, can you listen to TV with a higher sound volume? 10.a. Can you recognize a friend 4 meters away? 10.b. If not, can you recognize a friend 1 meter away?	1. Yes / 2. No	a.1: Not disabled a.2 + b.1: Moderate a.2 + b.2: Severe
11. Can you bite and chew an apple?	1. Yes, without difficulty 2. Yes, but with difficulty 3. Yes, but with a lot of difficulty 4. No, I can't	1: Not disabled 2: Moderate 3: Severe 4: Unable

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