

Disability in Bulgaria – Ten Years Later

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Abstract: At the EPC 2006 I present a paper about disability in Bulgaria during the period 1992-2004. Nowadays the data from the National Census toward 01.02.2011 are available. This will allow us to trace out the trend of disability during twenty years period. The essence of the method is the examination of the disability-free life expectancy; years lived with disability and disability-free life expectancy as a proportion of total life expectancy.

Introduction

For the last three decades there could be observed several serious demographic problems in Bulgaria. One of them is the depopulation. Another is aging. As a result of these problems Bulgarian population becomes smaller and older. *However, does it also become more disable?* In previous my research (Haralampiev 2006) I obtained that:

1. Disability in Bulgaria increases during the period 1992-2004. Almost for all of the cases it increases absolutely and in some exceptional cases it increases only relatively.
2. Increasing of disability concerns all age groups of the population.
3. Disability in the female population is larger and it increases faster than disability in the male population.

Now I will continue my research including the recent available demographic data, including the data from the last National Census conducted in 2011.

Method

The applied method is suggested by Robine and Mathers, who “identified four possibilities for the evolution of disability-free life expectancy in the population:

1. absolute compression of morbidity: the increase in disability-free life expectancy exceeds the increase in total life expectancy, reducing the years lived with disability.
2. relative compression of morbidity: disability-free life expectancy and years lived with disability both increase, but disability-free life expectancy as a proportion of total life expectancy increases.
3. relative expansion of morbidity: disability-free life expectancy and years lived with disability both increase, but disability-free life expectancy as a proportion of total life expectancy decreases.

4. absolute expansion of morbidity: disability-free life expectancy decreases and years lived with disability increase.” (Mathers 1999: 37)

Data and results

There are two different data sources of calculation of disability-free life expectancy in Bulgaria. The first one is the National Census. Data about the number of disable persons is collected only in the last three Censuses in Bulgaria conducted in 1992, 2001 and 2011. The second data source is the information supplied by the National Social Security Institute of Bulgaria about the number of persons who receive disability pension. Such information is available since 1997.

In Bulgaria there does not exist routine practice of calculation of disability-free life expectancy. For that reason Bulgarian researchers have to calculate it themselves. Thus, in the paper are presented results from my own calculation using Sullivan method (Hauet 1997). The obtained disability-free life expectancies as well as the years lived with disability based on information from the National Censuses are presented in Tables 1 and 2 and Figures 1, 2, 3 and 4.

Table 1. Life expectancy, disability-free life expectancy and years lived with disability (male) (years)

Age groups	Life expectancy			Disability-free life expectancy			Years lived with disability		
	1990-1992	1999-2001	2009-2011	1990-1992	1999-2001	2009-2011	1990-1992	1999-2001	2009-2011
15-19	53,80	54,95	56,39	50,67	51,56	52,73	3,13	3,39	3,66
20-24	50,03	50,16	51,57	46,91	46,79	47,94	3,12	3,37	3,62
25-29	45,35	45,43	46,82	42,27	42,10	43,23	3,09	3,33	3,58
30-34	40,68	40,70	42,07	37,64	37,42	38,55	3,05	3,29	3,53
35-39	36,06	36,06	37,37	33,08	32,83	33,92	2,99	3,22	3,45
40-44	31,56	31,51	32,72	28,65	28,36	29,37	2,92	3,15	3,35
45-49	27,28	27,19	28,28	24,45	24,13	25,04	2,83	3,06	3,24
50-54	23,21	23,16	24,15	20,48	20,20	21,03	2,73	2,96	3,12
55-59	19,41	19,44	20,35	16,80	16,59	17,36	2,61	2,85	2,99
60-64	15,88	16,02	16,90	13,41	13,30	14,06	2,47	2,72	2,85
65-69	12,69	12,94	13,79	10,39	10,38	11,11	2,30	2,56	2,68
70-74	9,85	10,14	10,89	7,75	7,78	8,44	2,10	2,36	2,46
75-79	7,42	7,74	8,33	5,56	5,61	6,15	1,86	2,12	2,18
80+	5,39	5,74	6,11	3,83	3,92	4,30	1,56	1,81	1,81

Notes: 1. Information for life expectancy is supplied by the National Statistical Institute of Bulgaria.

2. Disability-free life expectancy is calculated by the author.

3. Disability-free life expectancy is based on information about the number of disable persons from the National Censuses toward 04.12.1992, 01.03.2001 and 01.02.2011.

Figure 1. Disability-free life expectancy based on information from the National Censuses about the number of disable persons (male)

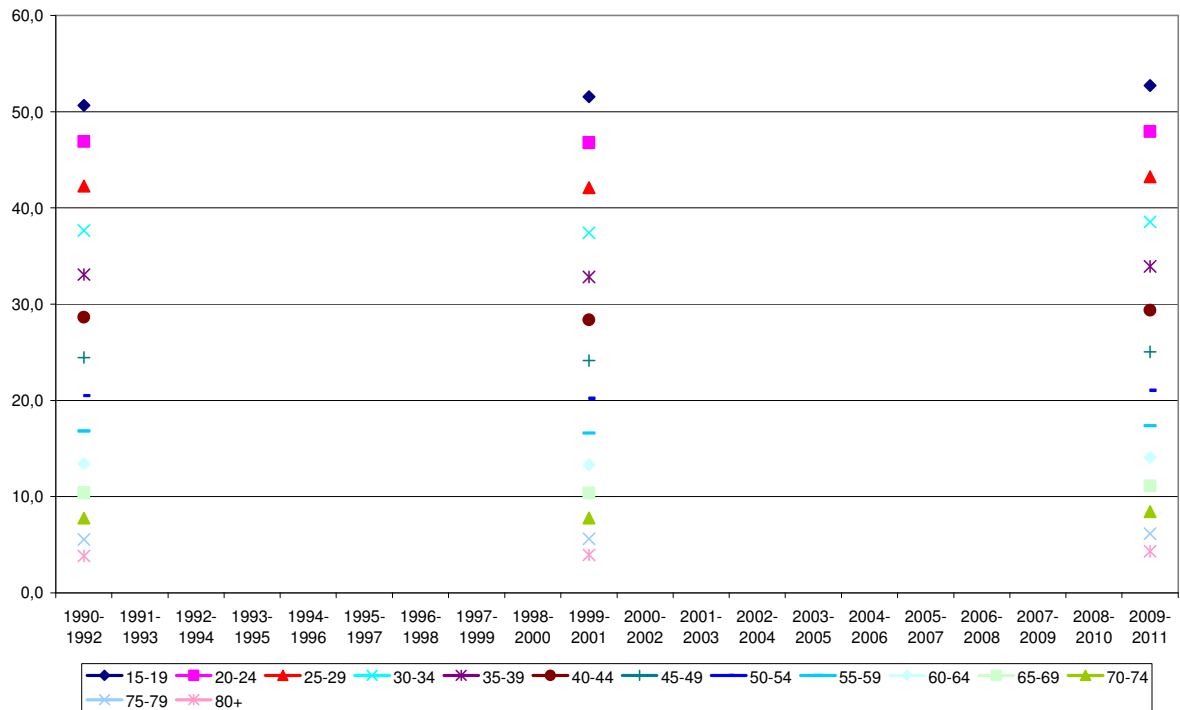


Figure 2. Years lived with disability based on information from the National Censuses about the number of disable persons (male)

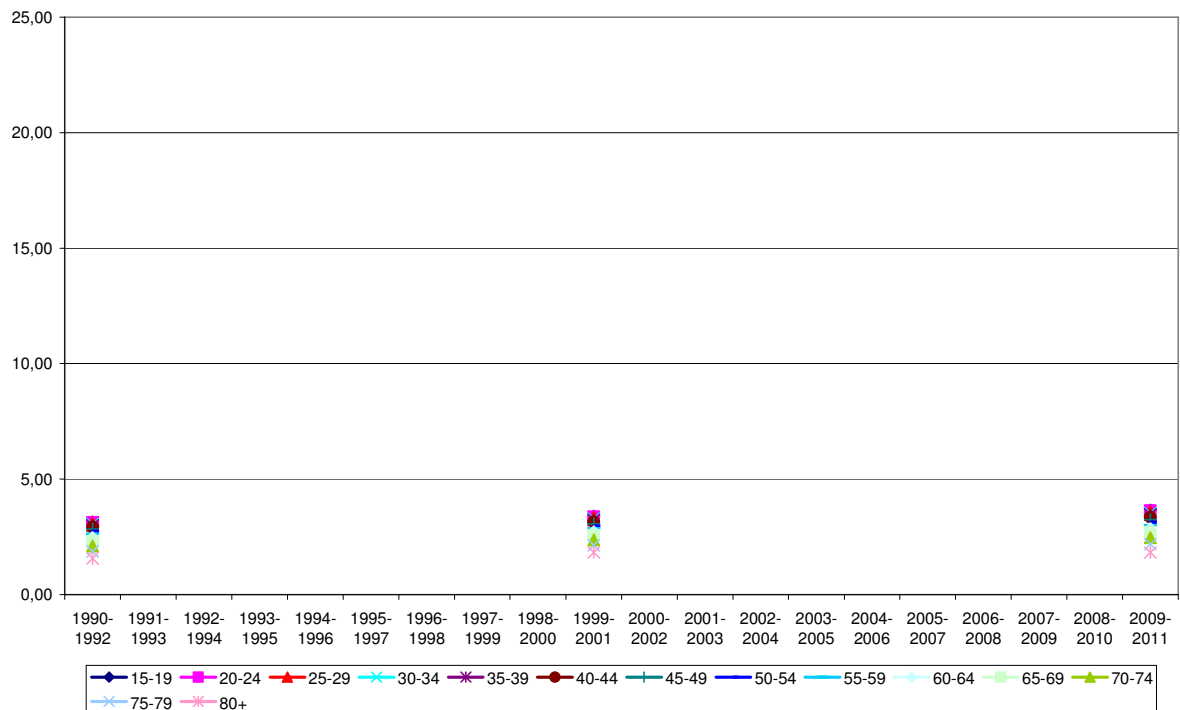


Table 2. Life expectancy, disability-free life expectancy and years lived with disability (female)

(years)

Age groups	Life expectancy			Disability-free life expectancy			Years lived with disability		
	1990-1992	1999-2001	2009-2011	1990-1992	1999-2001	2009-2011	1990-1992	1999-2001	2009-2011
15-19	60,00	61,51	63,19	55,38	56,04	58,19	4,62	5,47	4,99
20-24	56,11	56,64	58,29	51,50	51,18	53,32	4,61	5,45	4,97
25-29	51,25	51,78	53,41	46,66	46,34	48,48	4,59	5,43	4,93
30-34	46,42	46,91	48,53	41,86	41,51	43,65	4,56	5,40	4,88
35-39	41,59	42,10	43,69	37,08	36,75	38,88	4,51	5,35	4,81
40-44	36,84	37,34	38,91	32,40	32,06	34,19	4,44	5,28	4,72
45-49	32,17	32,69	34,24	27,81	27,50	29,64	4,35	5,19	4,61
50-54	27,61	28,17	29,70	23,38	23,10	25,24	4,23	5,07	4,46
55-59	23,19	23,76	25,28	19,13	18,86	21,00	4,07	4,89	4,27
60-64	18,97	19,52	21,03	15,12	14,86	17,00	3,85	4,66	4,03
65-69	15,02	15,55	16,95	11,45	11,20	13,23	3,57	4,35	3,71
70-74	11,44	11,91	13,11	8,22	7,96	9,80	3,22	3,95	3,31
75-79	8,41	8,80	9,66	5,59	5,32	6,85	2,83	3,48	2,81
80+	5,93	6,28	6,81	3,60	3,38	4,56	2,33	2,90	2,25

Notes: 1. Information for life expectancy is supplied by the National Statistical Institute of Bulgaria.

2. Disability-free life expectancy is calculated by the author.

3. Disability-free life expectancy is based on information about the number of disable persons from the National Censuses toward 04.12.1992, 01.03.2001 and 01.02.2011.

Figure 3. Disability-free life expectancy based on information from the National Censuses about the number of disable persons (female)

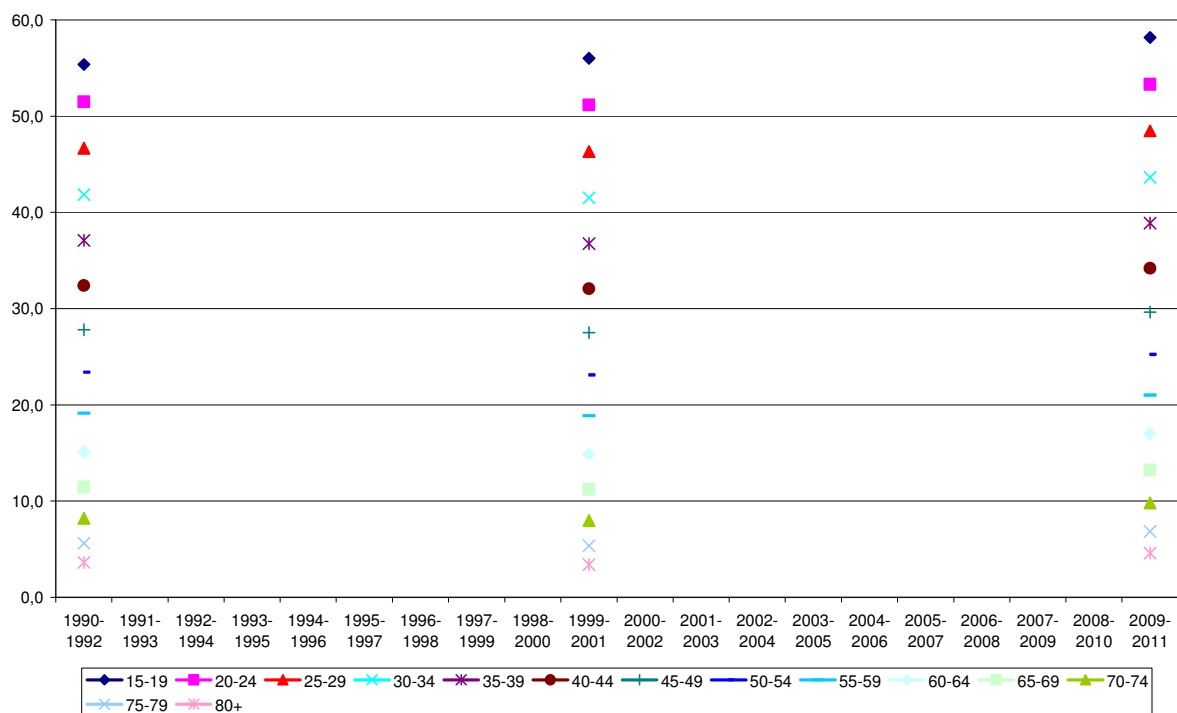
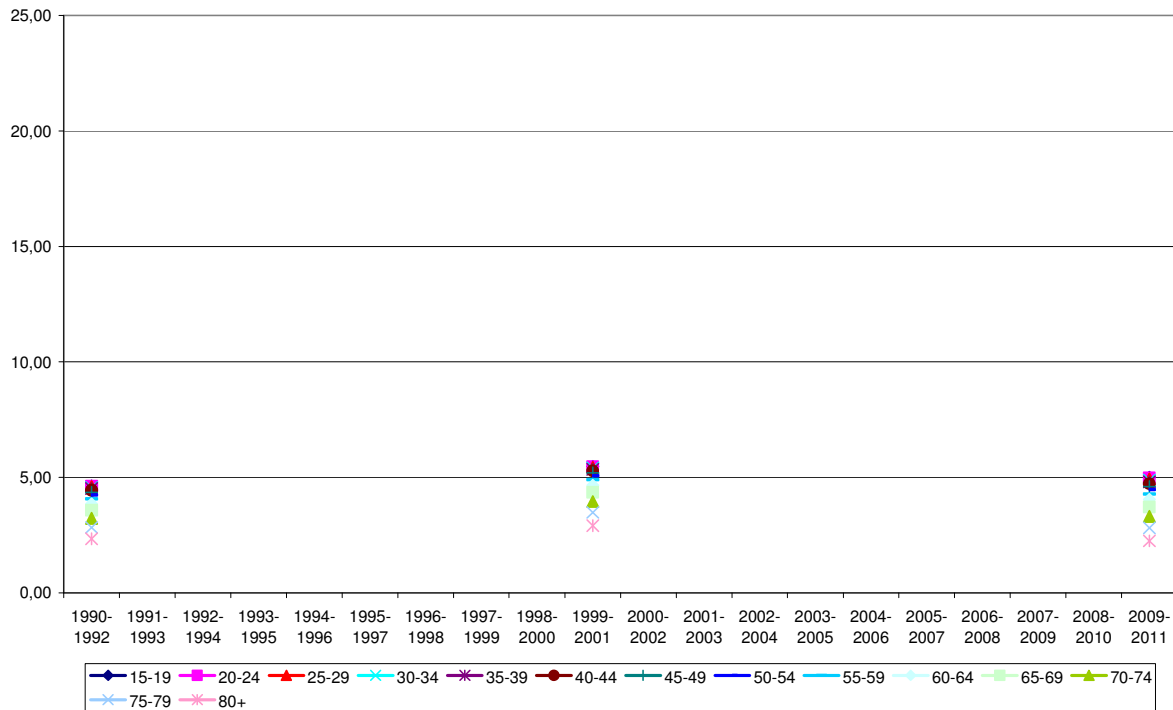


Figure 4. Years lived with disability based on information from the National Censuses about the number of disable persons (female)



Also, disability-free life expectancies and years lived with disability based on information from the National Social Security Institute of Bulgaria are also calculated by the author himself. The obtained results are presented in Tables 4, 5, 7 and 8 and Figures 5, 6, 7 and 8.

Table 3. Life expectancy (male)

(years)

Age groups	Periods ¹											
	1995-1997	1997-1999	1998-2000	1999-2001	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2008-2010
15-19	53,84	54,30	54,70	54,95	55,01	55,07	55,44	55,32	55,21	55,28	55,51	56,07
20-24	49,07	49,51	49,92	50,16	50,21	50,25	50,62	50,48	50,36	50,47	50,71	51,25
25-29	44,37	44,80	45,20	45,43	45,49	45,52	45,88	45,75	45,64	45,74	45,98	46,52
30-34	39,68	40,08	40,47	40,70	40,75	40,79	41,16	41,03	40,90	41,01	41,26	41,79
35-39	35,05	35,43	35,80	36,06	36,09	36,09	36,46	36,34	36,21	36,31	36,57	37,08
40-44	30,58	30,91	31,26	31,51	31,54	31,52	31,89	31,76	31,63	31,71	31,94	32,46
45-49	26,35	26,61	26,95	27,19	27,20	27,19	27,52	27,38	27,26	27,32	27,52	28,04
50-54	22,40	22,65	22,95	23,16	23,16	23,13	23,43	23,28	23,18	23,24	23,41	23,91
55-59	18,74	19,01	19,21	19,44	19,47	19,43	19,75	19,60	19,50	19,53	19,68	20,13
60-64	15,38	15,63	15,79	16,02	16,03	15,99	16,35	16,21	16,14	16,20	16,33	16,71
65-69	12,32	12,61	12,79	12,94	12,99	12,90	13,28	13,14	13,08	13,12	13,23	13,62
70-74	9,48	9,80	9,95	10,14	10,22	10,11	10,59	10,37	10,30	10,35	10,41	10,77
75-79	7,05	7,40	7,49	7,74	7,79	7,61	8,21	7,90	7,84	7,93	7,97	8,25
80+	5,16	5,49	5,35	5,74	5,79	5,55	6,44	5,85	5,77	5,89	5,81	6,03

Source: National Statistical Institute of Bulgaria.

Table 4. Disability-free life expectancy (male)

(years)

Age groups	Periods											
	1995-1997	1997-1999	1998-2000	1999-2001	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2008-2010
15-19	43,99	44,06	45,06	44,63	44,51	44,17	42,81	42,08	42,07	42,41	42,82	43,15
20-24	39,18	39,23	40,24	39,80	39,67	39,31	37,95	37,19	37,19	37,55	37,98	38,29
25-29	34,42	34,46	35,47	35,02	34,90	34,53	33,15	32,40	32,39	32,75	33,18	33,49
30-34	29,66	29,68	30,68	30,24	30,11	29,75	28,36	27,60	27,58	27,95	28,39	28,70
35-39	24,96	24,95	25,95	25,52	25,38	25,00	23,59	22,83	22,81	23,18	23,62	23,91
40-44	20,37	20,32	21,32	20,88	20,74	20,35	18,92	18,14	18,12	18,47	18,90	19,20
45-49	15,96	15,84	16,86	16,41	16,28	15,88	14,40	13,60	13,58	13,92	14,33	14,63
50-54	11,75	11,60	12,63	12,15	12,04	11,64	10,10	9,27	9,26	9,59	9,99	10,28
55-59	7,79	7,61	8,62	8,16	8,09	7,71	6,13	5,32	5,30	5,60	5,97	6,23
60-64	4,20	3,98	4,95	4,53	4,49	4,15	2,65	1,97	1,95	2,18	2,46	2,67
65-69	1,31	1,11	1,89	1,56	1,57	1,33	0,16	0,00	0,00	0,00	0,00	0,12
70-74	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
75-79	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
80+	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Notes: 1. Disability-free life expectancy is calculated by the author.

2. Disability-free life expectancy is based on information from the National Social Security Institute of Bulgaria about the number of disability pensions.

¹ Life table for the period 1996-1998 does not exist.

Figure 5. Disability-free life expectancy based on information from the National Social Security Institute of Bulgaria about the number of disability pensions (male)

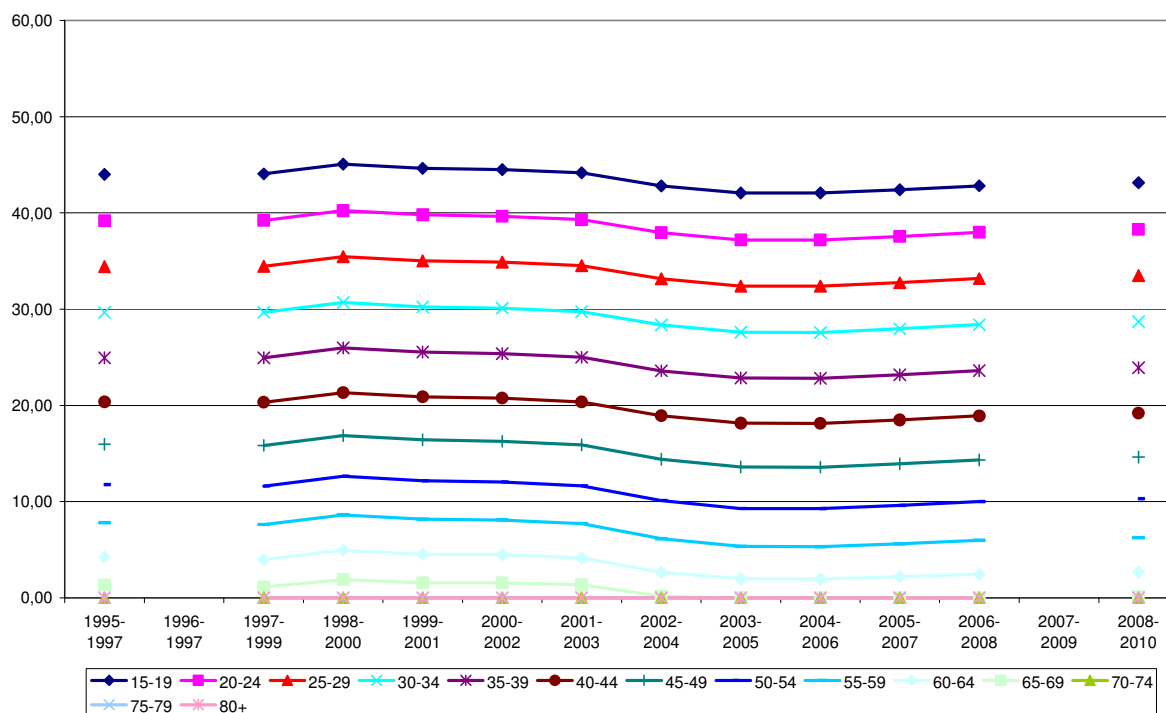


Table 5. Years lived with disability (male)

(years)

Age groups	Periods											
	1995-1997	1997-1999	1998-2000	1999-2001	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2008-2010
15-19	9,85	10,24	9,64	10,32	10,50	10,90	12,63	13,25	13,14	12,88	12,69	12,92
20-24	9,89	10,28	9,68	10,36	10,54	10,94	12,67	13,28	13,17	12,92	12,73	12,96
25-29	9,95	10,34	9,73	10,41	10,59	10,99	12,73	13,36	13,24	12,99	12,80	13,03
30-34	10,01	10,40	9,78	10,47	10,64	11,04	12,80	13,43	13,31	13,06	12,87	13,10
35-39	10,09	10,48	9,85	10,54	10,71	11,10	12,87	13,51	13,40	13,14	12,95	13,17
40-44	10,21	10,59	9,94	10,63	10,79	11,17	12,97	13,62	13,51	13,24	13,04	13,27
45-49	10,40	10,77	10,09	10,78	10,93	11,30	13,12	13,79	13,68	13,40	13,19	13,41
50-54	10,65	11,05	10,32	11,00	11,13	11,49	13,33	14,01	13,92	13,64	13,42	13,63
55-59	10,95	11,40	10,59	11,28	11,38	11,73	13,62	14,28	14,20	13,93	13,71	13,90
60-64	11,18	11,65	10,84	11,49	11,54	11,84	13,70	14,24	14,19	14,02	13,87	14,04
65-69	11,01	11,50	10,90	11,38	11,42	11,58	13,12	13,14	13,08	13,12	13,23	13,50
70-74	9,48	9,80	9,95	10,14	10,22	10,11	10,59	10,37	10,30	10,35	10,41	10,77
75-79	7,05	7,40	7,49	7,74	7,79	7,61	8,21	7,90	7,84	7,93	7,97	8,25
80+	5,16	5,49	5,35	5,74	5,79	5,55	6,44	5,85	5,77	5,89	5,81	6,03

Figure 6. Years lived with disability based on information from the National Social Security Institute of Bulgaria about the number of disability pensions (male)

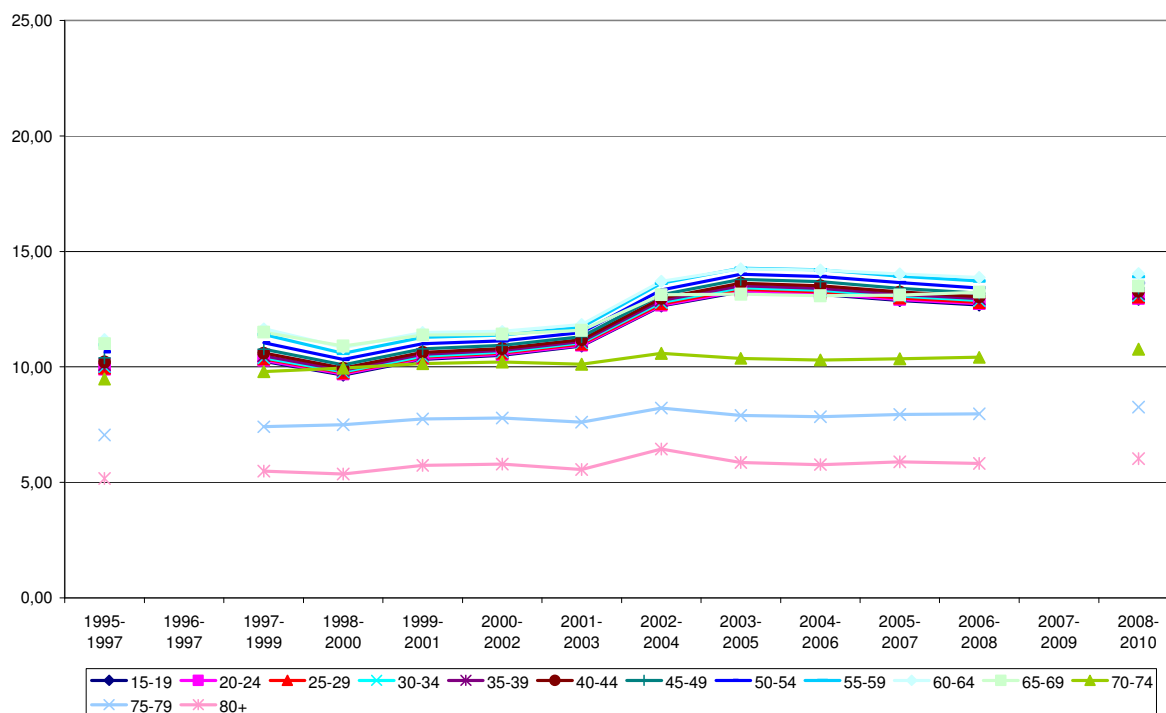


Table 6. Life expectancy (female)

(years)

Age groups	Periods											
	1995-1997	1997-1999	1998-2000	1999-2001	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2008-2010
15-19	60,88	61,11	61,44	61,51	61,73	61,80	62,30	62,40	62,30	62,39	62,53	63,17
20-24	56,02	56,23	56,56	56,64	56,84	56,88	57,39	57,50	57,40	57,49	57,64	58,27
25-29	51,16	51,36	51,69	51,78	51,98	52,00	52,51	52,62	52,50	52,60	52,76	53,38
30-34	46,33	46,52	46,84	46,91	47,11	47,13	47,64	47,75	47,62	47,71	47,87	48,50
35-39	41,51	41,71	42,04	42,10	42,29	42,30	42,82	42,91	42,79	42,87	43,02	43,66
40-44	36,76	36,96	37,31	37,34	37,55	37,54	38,06	38,16	38,02	38,10	38,24	38,88
45-49	32,11	32,31	32,65	32,69	32,89	32,86	33,40	33,48	33,35	33,44	33,57	34,17
50-54	27,58	27,77	28,12	28,17	28,36	28,32	28,86	28,96	28,84	28,91	29,01	29,63
55-59	23,16	23,37	23,70	23,76	23,96	23,93	24,47	24,56	24,44	24,52	24,61	25,22
60-64	18,98	19,17	19,50	19,52	19,70	19,67	20,22	20,30	20,18	20,28	20,37	20,97
65-69	15,05	15,20	15,56	15,55	15,71	15,66	16,21	16,27	16,13	16,22	16,30	16,87
70-74	11,46	11,58	11,92	11,91	12,07	12,01	12,59	12,59	12,41	12,49	12,52	13,06
75-79	8,45	8,44	8,80	8,80	8,92	8,81	9,42	9,35	9,16	9,24	9,22	9,70
80+	5,95	5,89	6,21	6,28	6,41	6,26	6,96	6,75	6,54	6,62	6,49	6,89

Source: National Statistical Institute of Bulgaria.

Table 7. Disability-free life expectancy (female)

(years)

Age groups	Periods											
	1995-1997	1997-1999	1998-2000	1999-2001	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2008-2010
15-19	42,78	43,22	44,10	43,52	43,13	42,37	40,75	40,09	40,23	40,69	41,44	42,10
20-24	37,88	38,31	39,18	38,61	38,21	37,43	35,81	35,15	35,29	35,75	36,50	37,17
25-29	32,98	33,40	34,28	33,71	33,31	32,51	30,89	30,23	30,35	30,82	31,58	32,24
30-34	28,09	28,50	29,38	28,80	28,40	27,60	25,97	25,31	25,43	25,90	26,66	27,32
35-39	23,21	23,63	24,51	23,93	23,53	22,73	21,09	20,42	20,54	21,00	21,76	22,42
40-44	18,39	18,80	19,71	19,11	18,73	17,92	16,27	15,59	15,70	16,16	16,92	17,58
45-49	13,65	14,06	14,97	14,39	14,02	13,21	11,56	10,87	10,98	11,44	12,18	12,83
50-54	9,07	9,46	10,37	9,83	9,49	8,70	7,07	6,41	6,50	6,92	7,64	8,29
55-59	4,83	5,18	6,05	5,57	5,30	4,59	3,06	2,50	2,56	2,87	3,53	4,14
60-64	1,41	1,65	2,33	2,00	1,83	1,32	0,17	0,00	0,00	0,00	0,47	0,92
65-69	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
70-74	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
75-79	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
80+	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Notes: 1. Disability-free life expectancy is calculated by the author.

2. Disability-free life expectancy is based on information from the National Social Security Institute of Bulgaria about the number of disability pensions.

Figure 7. Disability-free life expectancy based on information from the National Social Security Institute of Bulgaria about the number of disability pensions (female)

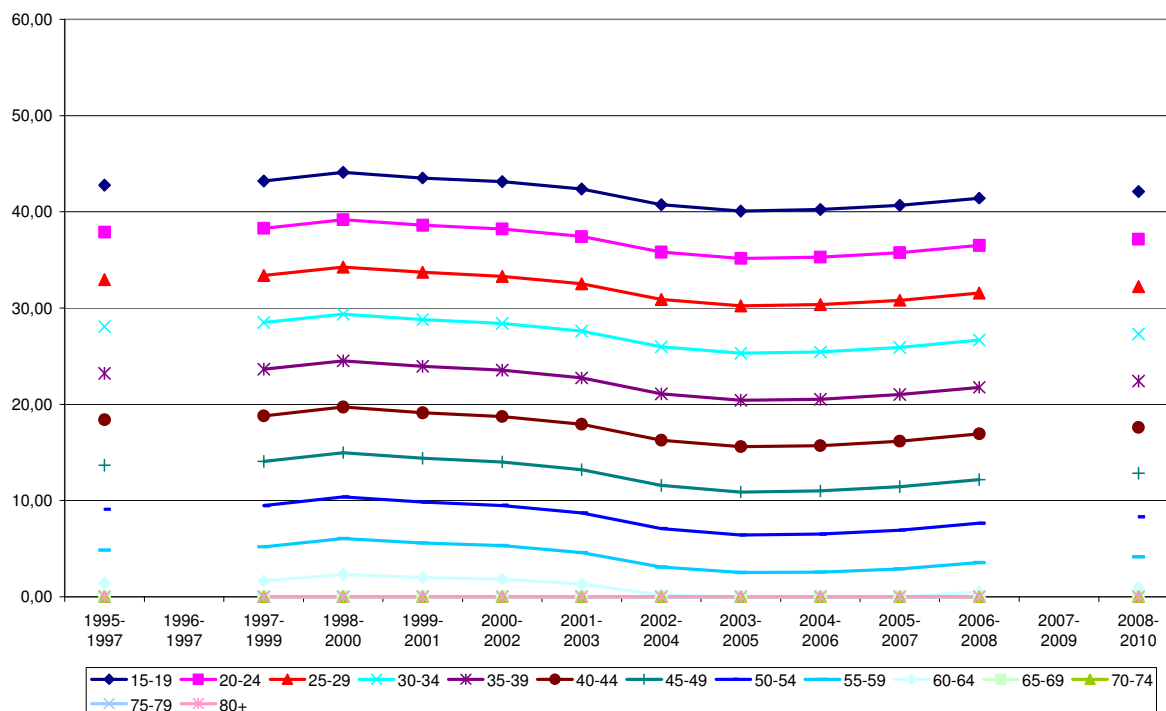
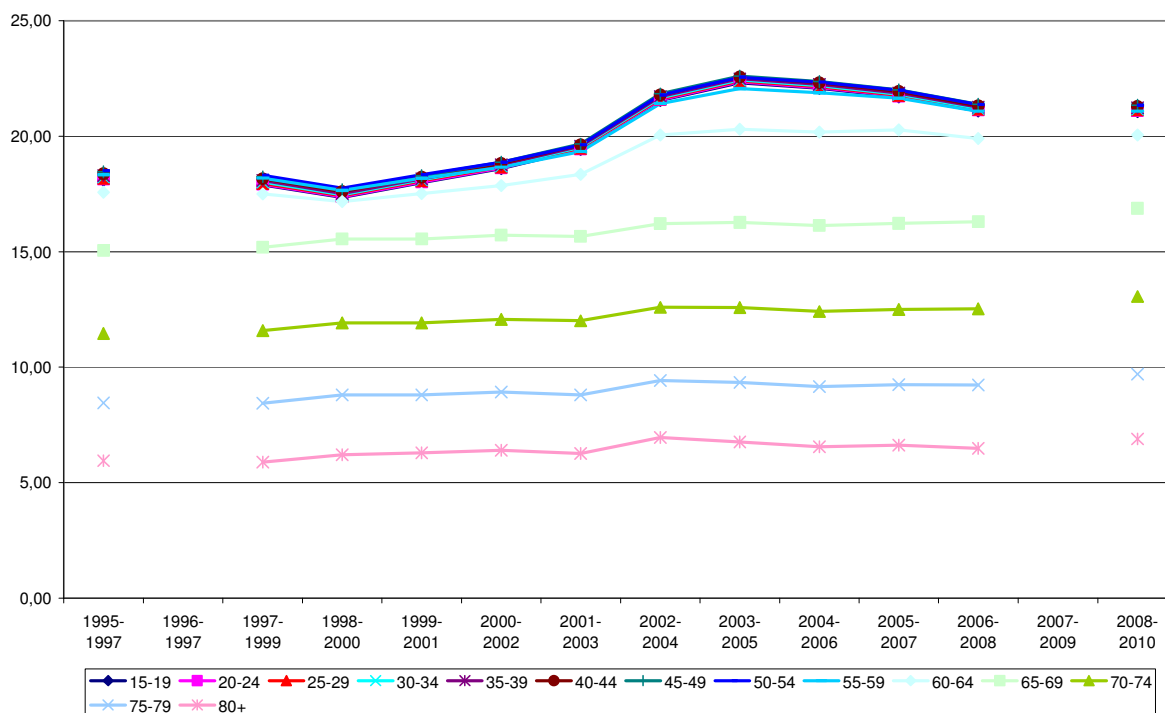


Table 8. Years lived with disability (female)

Age groups	Periods (years)											
	1995-1997	1997-1999	1998-2000	1999-2001	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2008-2010
15-19	18,10	17,89	17,34	17,99	18,60	19,43	21,55	22,31	22,08	21,70	21,10	21,07
20-24	18,14	17,92	17,38	18,02	18,63	19,45	21,58	22,35	22,11	21,74	21,13	21,11
25-29	18,18	17,97	17,42	18,07	18,67	19,49	21,62	22,39	22,15	21,78	21,17	21,14
30-34	18,24	18,02	17,46	18,11	18,71	19,53	21,67	22,44	22,19	21,82	21,21	21,18
35-39	18,30	18,08	17,52	18,16	18,76	19,57	21,72	22,49	22,25	21,87	21,26	21,23
40-44	18,37	18,16	17,60	18,23	18,82	19,62	21,79	22,57	22,32	21,94	21,32	21,29
45-49	18,46	18,25	17,68	18,30	18,87	19,66	21,84	22,61	22,37	22,01	21,39	21,34
50-54	18,50	18,31	17,75	18,34	18,87	19,62	21,79	22,56	22,34	22,00	21,37	21,34
55-59	18,33	18,19	17,65	18,18	18,66	19,34	21,41	22,06	21,88	21,65	21,08	21,08
60-64	17,57	17,51	17,17	17,52	17,87	18,35	20,06	20,30	20,18	20,28	19,90	20,05
65-69	15,05	15,20	15,56	15,55	15,71	15,66	16,21	16,27	16,13	16,22	16,30	16,87
70-74	11,46	11,58	11,92	11,91	12,07	12,01	12,59	12,59	12,41	12,49	12,52	13,06
75-79	8,45	8,44	8,80	8,80	8,92	8,81	9,42	9,35	9,16	9,24	9,22	9,70
80+	5,95	5,89	6,21	6,28	6,41	6,26	6,96	6,75	6,54	6,62	6,49	6,89

Figure 8. Years lived with disability based on information from the National Social Security Institute of Bulgaria about the number of disability pensions (female)



Differences between results obtained using various data sources are due to different definitions of disability. According to the National Censuses the persons are counted as disable on the base of decision of Territorial Expert Medical Commission. The National

Social Security Institute of Bulgaria supplies information only about the persons who receive disability pension as a first pension. If the person receives a retirement pension as a first pension and a disability pensions as a second pension, he/she is not included in the data².

However, all data sources lead to the similar results. Moreover, they practically lead to the same conclusions.

Conclusions

According to the rules of Robine and Mathers we could conclude that:

1. Disability in Bulgaria increases during the period 1992-2005. Then disability starts to decrease. For female population it decreases during the whole period. For the male population it decreases during the period 2006-2008 and then starts to increase.
2. Disability in the female population is larger than disability in the male population while the disability-free life expectancy is almost the same among the male and female population.

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² For that reason, the relative frequency of disable persons is estimated by model $\pi_x = ab^x$ where π_x is the relative frequency of disability persons and x is the lower bound of age group.