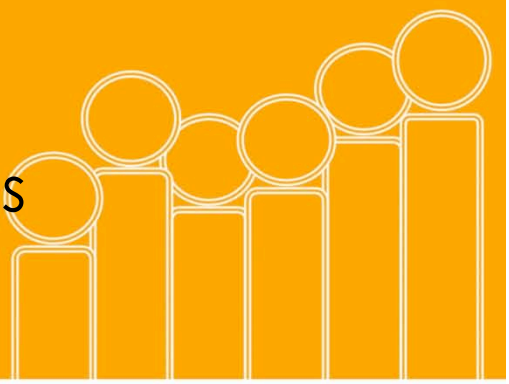
Improving Health and Lives:
Learning Disabilities Observatory

The Estimated Prevalence of Visual Impairment among People with Learning Disabilities in the UK

Eric Emerson & Janet Robertson



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Eric Emerson & Janet Robertson

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About the Authors

Eric Emerson is Co-Director of the Improving Health and Lives Learning Disabilities Observatory. Eric is also Professor of Disability & Health Research at the Centre for Disability Research, School of Health & Medicine, Lancaster University and Visiting Professor at the Australian Family and Disabilities Studies Research Collaboration, University of Sydney.

Janet Robertson is a Lecturer in Health Research at the Centre for Disability Research, School of Health & Medicine, Lancaster University.

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Summary

The aim of this report is to estimate how many people with learning disabilities in the UK are likely to have visual impairments. It has been known for some time that visual impairments are more common among people with learning disabilities, especially people with more severe learning disabilities, and that the presence of visual impairments can significantly impair the independence and quality of life of people with learning disabilities.

There is, however, no national monitoring of the number of people with learning disabilities who have visual impairments. Neither does there exist robust epidemiological data on the prevalence of visual impairments among people with learning disabilities in the UK. As a result, this report uses epidemiological data from the Netherlands and Denmark to answer two questions:

1. How many people with learning disabilities in the UK are likely to have visual impairments?
2. How will this number change over the coming decades?

To answer these questions we combined age-specific population predictions for the UK for the period 2011-2031 with estimates of the age-specific prevalence of learning disabilities and the age-specific prevalence of visual impairments among people with learning disabilities.

Our results suggested that:

- At present approximately 50,000 people with learning disabilities who are known to services in the UK have visual impairment (19,000 children, 31,000 adults)
- An additional 15,000 are blind (4,000 children, 11,000 adults)
- We assume that all children with learning disabilities are known to (education) services. However, as not all adults with learning disabilities are known to adult health or social care learning disabilities services we estimate that there may be an additional 44,000 adults with learning disabilities and visual impairment and 11,000 with learning disabilities and blindness.
- With regard to specific refractive errors, we estimate that
    - 32,000 children with learning disabilities have myopia ('shortsightedness' resulting in difficulty focusing on more distant objects) ($\leq$0.5D) and 55,000 hyperopia ('longsightedness' resulting in difficulty focusing on closer objects) ($\geq$+3D)
    - 11,000 adults with learning disabilities known to services have severe myopia ($\leq$ -5D) and 8,000 severe hyperopia ($\geq$+5D)
- We predict that all of these figures will rise by approximately 0.5% each year over the next two decades

Background

The aim of this report is to estimate how many people with learning disabilities in the UK are likely to have visual impairments. It has been known for some time that visual impairments are more common among people with learning disabilities, especially people with more severe learning disabilities, and that the presence of visual impairments can significantly impair the independence and quality of life of people with learning disabilities.[1-4]

There is, however, no national monitoring of the number of people with learning disabilities who have visual impairments. Neither does there exist robust epidemiological data on the prevalence of visual impairments among people with learning disabilities in the UK. As a result, this report uses epidemiological data from the Netherlands and Denmark to answer two questions:

1. How many people with learning disabilities in the UK are likely to have visual impairments?

2. How will this number change over the coming decades?

The Process

The research involved a two stage process. First, we had to estimate how many people with learning disabilities there are in the UK now and in the future. Second, we had to estimate how many of these people were likely to have visual impairments.

How Many People with Learning Disabilities are there in the UK?

There is no definitive record of the number of people with learning disabilities in the UK or any of its constituent countries. The presence of learning disabilities is not recorded in the decennial Census of the UK population. No government department collects comprehensive information on the presence of learning disabilities in the population.

It is, however, possible to estimate the number of people with learning disabilities in the UK by combining information collected by government departments on the presence of learning disabilities among people using particular services, overall population predictions for England and the results of epidemiological research.[5]

Children

Information is collected by the Department for Education in England on the special educational needs (SEN) of all children in maintained schools and non-maintained special schools. Children not included in this process include children being educated at home and children educated in independent (non-state funded) mainstream schools and profit making independent special schools. Three types of SEN, when combined, are reasonably equivalent to learning disabilities: Moderate Learning Difficulty (MLD); Severe Learning Difficulty (SLD); and Profound Multiple Learning Difficulty (PMLD). The identification of SEN associated with learning disabilities is most stable in the age range 7-15.[6] In this age range 2.56% of girls and 4.19% of boys in 2010 were identified at School Action Plus or with a Statement of Special Educational Need with a *primary* SEN associated with learning disabilities. Of these, 0.38% of girls and 0.60% of boys were identified with a primary SEN of severe or profound multiple learning difficulties (approximately equivalent to severe learning disabilities). These estimates are consistent with the results of epidemiological studies of the prevalence of learning disabilities in children.[7] [8]

In very early childhood, only severe learning disabilities are likely to be apparent. As a result, we have assumed that the prevalence of learning disabilities at age two years and below is 0.38% for girls and 0.60% for boys rising in incremental steps each year to the higher rates at age five. Applying these English-based prevalence estimates to estimates of the UK population aged 0-19 in 2011[1] indicates that approximately 410,000 UK children and young people (259,000 boys, 151,000 girls) have learning disabilities. The age and gender profile of this estimated population is shown in Table 1.

[1] Estimates of the current and future population of the UK are produced biennially by the UK's Office for National Statistics http://www.statistics.gov.uk/pdfdir/pproj1009.pdf

Table 1: Estimated Number of Children with Learning Disabilities by Gender and Age, UK 2011			
Age at Last Birthday	**Boys**	**Girls**	**Total Children**
England			
0-4	22,200	13,200	35,400
5-9	63,400	37,000	100,400
10-14	62,700	36,600	99,300
15-19	68,800	39,800	108,700
Total	217,100	126,600	343,800
Wales			
0-4	1,200	700	1,900
5-9	3,500	2,000	5,500
10-14	3,700	2,200	5,900
15-19	4,200	2,400	6,600
Total	12,600	7,300	19,900
Scotland			
0-4	2,000	1,200	3,200
5-9	5,800	3,400	9,200
10-14	6,100	3,500	9,600
15-19	6,800	4,000	10,700
Total	20,700	12,100	32,700
Northern Ireland			
0-4	900	500	1,400
5-9	2,400	1,400	3,900
10-14	2,600	1,500	4,000
15-19	2,700	1,500	4,200
Total	8,600	4,900	13,500
UK			
0-4	26,200	15,500	41,800
5-9	75,200	43,900	119,100
10-14	75,100	43,700	118,800
15-19	82,400	47,800	130,200
Total	258,900	150,900	409,900

If we assume that the age and gender specific prevalence rate of learning disabilities in children remains constant over time, we can also apply these prevalence rates to predictions of the population of the UK in future years. Doing so suggests that the number of children and young people aged 0-19 with learning disabilities in the UK will increase from 410,000 in 2011 to 430,000 in 2021 and 450,000 in 2031. These increases are equivalent to a compound annual growth rate of +0.49%.[2]

[2] The compound annual growth rate is the annual percentage increase/decrease that if applied constantly across the time period in question (e.g., 2011 to 2031) would account for the observed change in numbers between the start and end of the period.

It needs to be kept in mind that these increases are solely the result of the predicted increase in the number of young people in the UK population over the coming two decades. As a result of demographic differences between countries these changes will vary across the constituent countries of the UK. The estimated compound annual growth rate over the period 2011 to 2031 in the number of young people with learning disabilities is +0.57% for England, +0.21% for Wales, -0.02% for Scotland and +0.05% for Northern Ireland.

Adults

Three approaches can be taken to estimating the numbers of adults with learning disabilities in the UK. These are based on the:

- number of people *using* learning disabilities services;
- number of people *known* to learning disabilities services; and
- estimated number of people with learning disabilities in the population.

It is possible to identify the number of adults who use some specific services for people with learning disabilities. The most comprehensive information of this kind in England is collected annually from Councils with Social Service Responsibilities in relation to the number of adults who have received social care services in any given year. Data for 2009/10 indicates that 141,715 adults in England aged 18+ received specific social care services designated for people with learning disabilities.[3] These are, however, poor estimates of the actual number of adults with learning disabilities in England.

First, people may use services intermittently. That is, they may be known to Councils with Social Service Responsibilities as people with learning disabilities, but may not have been receiving a service at that particular census point or period. Data from PCTs in England suggest that 179,000 adults with learning disabilities were 'known to Councils with Adult Social Services Responsibilities' in 2009/10 (see below). Previous research commissioned by the Department of Health estimated that in 2004 177,000 adults are likely to be known to adult social care services as people with learning disabilities.[9] [10]

Second, it is clear that the majority of adults with learning disabilities simply do not use learning disabilities services. For example, the administrative prevalence of learning disability (i.e., the number of people known to services as people with learning disabilities) in England drops precipitously from 3% among children in the education system (see above), to 0.6% among adults aged 20-29.[9] It is highly implausible that such reductions in prevalence can be accounted for by either reduced life expectancy or sudden improvements in intellectual functioning. Rather, it is likely that they reflect the impact of a combination of factors which include:

- A decrease in health/disability surveillance in post-education health and social care agencies;
- The operation of eligibility criteria to ration access to specialised social care supports for adults with learning disabilities;

[3] http://www.ic.nhs.uk/pubs/carestats0910asr

- The stigma associated with learning disability leading to an unwillingness for people with learning disabilities to use specialised services or self-identify as having learning disabilities;
- The lessened visibility of the disabling impact of the intellectual impairments associated with learning disabilities in non-educational settings.

Previous research commissioned by the Department of Health estimated that in 2004 828,000 adults in England are likely to have learning disabilities.[9 10]

In Table 2 we have applied the prevalence estimates from this previous research to population predictions for 2011 to estimate: (1) the likely number of adults with learning disabilities *known* to learning disabilities services; and (2) the likely number of adults with learning disabilities in the population.

Table 2: Estimated Number of Adults with Learning Disabilities, UK 2011

Age Group	Men Known to LD Services	Men with Learning Disabilities in Population	Women Known to LD Services	Women with Learning Disabilities in Population	Adults Known to LD Services	Adults with Learning Disabilities in Population
England						
20-24	12,900	57,900	9,100	37,800	22,100	95,700
25-29	10,700	54,100	8,300	35,900	19,000	90,100
30-34	10,000	49,000	7,600	33,100	17,600	82,100
35-39	11,400	48,700	8,800	33,700	20,200	82,400
40-44	13,500	55,200	9,900	37,800	23,400	93,000
45-49	11,800	50,700	9,400	36,100	21,200	86,800
50-54	7,900	42,200	6,500	29,900	14,400	72,100
55-59	7,600	37,100	6,900	26,200	14,500	63,400
60-64	6,400	35,500	5,400	25,900	11,800	61,400
65-69	4,500	26,400	3,400	19,100	7,900	45,500
70-74	2,700	20,800	2,400	15,300	5,100	36,200
75-79	1,600	14,400	1,200	11,500	2,800	25,900
80+	1,700	17,500	1,700	19,200	3,400	36,700
Total	102,800	509,600	80,700	361,600	183,500	871,200

Scotland						
20-24	1,300	5,600	900	3,700	2,100	9,300
25-29	1,000	5,100	800	3,400	1,800	8,500
30-34	900	4,600	700	3,100	1,700	7,700
35-39	1,000	4,400	800	3,200	1,900	7,600
40-44	1,300	5,300	1,000	3,900	2,300	9,200
45-49	1,200	5,100	1,000	3,900	2,200	9,000
50-54	900	4,500	700	3,400	1,600	7,900
55-59	800	4,100	800	2,900	1,600	7,000
60-64	700	3,800	600	2,800	1,300	6,500
65-69	500	2,700	400	2,000	800	4,700
70-74	300	2,200	300	1,700	500	3,900
75-79	200	1,500	100	1,300	300	2,700
80+	200	1,600	200	1,900	300	3,400
Total	10,100	50,300	8,300	37,200	18,400	87,500
Wales						
20-24	800	3,400	500	2,100	1,300	5,500
25-29	500	2,700	400	1,900	1,000	4,600
30-34	500	2,300	400	1,600	900	4,000
35-39	600	2,400	500	1,700	1,000	4,100
40-44	700	2,900	500	2,100	1,200	4,900
45-49	700	2,800	500	2,100	1,200	4,900
50-54	500	2,400	400	1,800	800	4,200
55-59	500	2,300	400	1,600	900	3,900
60-64	400	2,300	400	1,700	800	4,000
65-69	300	1,800	200	1,300	500	3,000
70-74	200	1,400	200	1,000	300	2,400
75-79	100	900	100	700	200	1,700
80+	100	1,100	100	1,200	200	2,300
Total	5,700	28,700	4,600	20,800	10,300	49,600
N Ireland						
20-24	500	2,000	400	1,300	800	3,400
25-29	400	1,900	300	1,300	700	3,200
30-34	300	1,700	300	1,200	600	2,800
35-39	400	1,700	300	1,200	700	2,800
40-44	400	1,800	300	1,300	800	3,100
45-49	400	1,700	300	1,200	700	2,900
50-54	300	1,400	200	1,000	500	2,500
55-59	300	1,300	200	900	500	2,100
60-64	200	1,100	200	800	400	1,800
65-69	100	900	100	600	300	1,500
70-74	100	600	100	500	200	1,100
75-79	<100	400	<100	400	100	800
80+	<100	500	<100	600	100	1,000
Total	3,400	16,900	2,700	12,200	6,200	29,100

UK						
20-24	15,400	68,900	10,900	44,900	26,200	113,800
25-29	12,600	63,900	9,900	42,600	22,500	106,400
30-34	11,800	57,600	8,900	39.000	20,700	96,600
35-39	13,400	57,100	10,400	39,900	23,800	97,000
40-44	15,900	65,100	11,800	45,100	27,700	110,200
45-49	14,100	60,400	11,300	43,200	25,300	103,600
50-54	9,500	50,600	7,900	36,100	17,300	86,600
55-59	9,200	44,800	8,400	31,700	17,500	76,500
60-64	7,700	42,700	6,500	31,100	14,200	73,800
65-69	5,400	31,800	4,100	23,000	9,500	54,700
70-74	3,200	25,000	2,900	18,500	6,100	43,500
75-79	1,900	17,200	1,400	13,900	3,400	31,100
80+	2,000	20,600	2,000	22,900	4,000	43,400
Total	122,100	605,700	96,400	431,700	218,400	1,037,400

If we assume that the age and gender specific prevalence rates of learning disabilities in adults remain constant over time, we can also apply these prevalence rates to predictions of the population of the UK in future years. Doing so suggests that the number of adults aged 20+ with learning disabilities *known to learning disabilities services* in the UK will increase from 218,400 in 2011 to 228,400 in 2021 and 238,300 in 2031. These increases are equivalent to a compound annual growth rate of +0.46%. The estimated number of adults aged 20+ with learning disabilities *in the UK population* will increase from 1,037,400 in 2011 to 1,104,500 in 2021 and 1,165,600 in 2031. These increases are equivalent to a compound annual growth rate of +0.62%.

Again, it needs to be kept in mind that these increases are solely the result of the predicted increase in the number of adults in the UK population over the coming two decades. As a result of demographic differences between countries these changes will vary across the constituent countries of the UK. The estimated compound annual growth rate over the period 2011 to 2031 in the number of adults with learning disabilities *known to services* is +0.51% for England, +0.30% for Wales, +0.06% for Scotland and +0.33% for Northern Ireland. The estimated compound annual growth rate over the period 2011 to 2031 in the number of adults with learning disabilities *in the population* is +0.66% for England, +0.48% for Wales, +0.25% for Scotland and +0.57% for Northern Ireland.

How Many People with Learning Disabilities Have Visual Impairments?

Children

The proportion of children with learning disabilities who have visual impairments was estimated from research undertaken in Denmark.[11 12] The reason for using the results of this study was simple; it represents the best study undertaken to date that actually assessed the prevalence of visual impairments among children with learning disabilities. The results of this study are broadly consistent with those of other studies which have actually assessed the prevalence of visual impairments among samples of children with learning disabilities.[13] This study examined visual functioning in 1,126 children aged 4-15 years old with profound to borderline learning disabilities. We extracted a point (best guess) estimate of visual impairment from the results of this study along with estimates based on the upper and lower 95% confidence intervals for this point estimate.[4] The study gave separate prevalence estimates for children with IQ <51 and children with IQ 51-70. We combined these estimates by assuming that children with IQ<51 would account for 5% of children with learning disabilities (with children with IQ 51-70 accounting for 95%).[5] It was not possible to derive estimates from this study that are sensitive to either child gender or age. Table 3 presents the prevalence estimates for visual impairment among children with learning disabilities that we used in our predictions.

Table 3: Point Prevalence Estimates (with 95% Confidence Intervals) of Visual Impairment Among Children with Learning Disabilities

	Point Estimate	Upper 95% CI	Lower 95% CI
Visual impairment (excluding blind)	4.73%	6.79%	2.67%
Blind	0.93%	1.76%	0.30%
Refractive Errors			
Hyperopia	13.54%	17.07%	10.00%
Myopia	7.93%	10.71%	5.14%
Astigmatism	25.30%	29.79%	20.80%

Visual impairment was defined as visual acuity ≤6/18. *Blindness* impairment was defined as visual acuity ≤6/60. *Hyperopia* was defined as ≥ +3.0 dioptre. *Myopia* was defined as ≤0.5 dioptre. *Astigmatism* was defined as <-1.0cyl dioptre.

[4] The 'confidence intervals' around a point estimate are the upper and lower limits within which we are 95% confident that the true population point estimate will fall. The larger the original sample size in the study, the narrower the confidence interval.

[5] The predicted proportions based on the normal distribution of intelligence are 2% and 98%. We used a 5%:95% split due to the likely bulge in the distribution of IQ at the very low end of the spectrum.

Adults

The proportion of adults with learning disabilities who have visual impairments was estimated from research undertaken in the Netherlands.[14 15] Again, the reason for using the results of this study was simple; it represents the best study undertaken to date that actually assessed the prevalence of visual impairments among adults with learning disabilities. The results of this study are broadly consistent with those of other studies which have actually assessed the prevalence of visual impairments among samples of adults with learning disabilities. [14 15] The study examined visual functioning in 1,598 adults who were using services for people with learning disabilities in the Netherlands. We extracted a point (best guess) estimate of visual impairment from the results of this study along with estimates based on the upper and lower 95% confidence intervals for this point estimate. For our administrative sample estimates (people known to learning disabilities services) we used the information provided in Table 5 in the Netherlands study[15] to derive separate estimates for the total population of adults with learning disabilities known to services aged below 50 and aged 50+. For example, the data in Table 5 indicate that 809 of 6643 (12.18%) adults under the age of 50 would be expected to have visual impairment. This group is comprised of 465 institutionalised adults without Down syndrome (15.3% of 3042), 175 non-institutionalised adults without Down syndrome (7.4% of 2364), 108 institutionalised adults with Down syndrome (18.1% of 594) and 61 non-institutionalised adults with Down syndrome (9.5% of 643).

For our total population estimates we assumed all adults not known to services would have prevalence rates identical to those reported in the study for people with mild learning disabilities. It was not possible to derive estimates from this study that are sensitive to gender. Table 4 presents the prevalence estimates for visual impairment among adults with learning disabilities that we used in our predictions.

Visual impairment was defined as visual acuity <0.30, but not <0.05 and/or visual fields <30 degrees around the central fixation point. *Blindness* impairment was defined as visual acuity <0.05 and or visual fields <10 degrees. *Refractive error* was defined as a measured spherical refractive error of more than ± 1.0 dioptre, cylindrical refractive error of more than -2 dioptre or both. *Severe myopia* and *hyperopia* were defined as refractive error of more than 5.00 dioptres.[6] No age-specific rates were presented for *severe myopia* and *hyperopia.* As a result, these were estimated from the overall prevalence rates and information on the age structure of the sample and the proportional age increase in all refractive errors.

[6] Note that this is a more stringent definition of myopia and hyperopia than used in the child estimates.

Table 4: Point Prevalence Estimates (with 95% Confidence Intervals) of Visual Impairment Among Adults with Learning Disabilities			
	Point Estimate	**Upper 95% CI**	**Lower 95% CI**
Adults with Learning Disabilities Known to Services			
Age 20-49			
Visual impairment (excluding blind)	12.18%	14.25%	10.11%
Blind	5.17%	6.57%	3.77%
Refractive error	58.90%	63.57%	54.23%
Severe hyperopia	3.7%	4.6%	2.8%
Severe myopia	4.9%	6.0%	3.8%
Age 50+			
Visual impairment (excluding blind)	18.37%	21.53%	15.21%
Blind	4.52%	6.21%	2.83%
Refractive error	63.70%	69.73%	57.67%
Severe hyperopia	4.0%	5.0%	3.0%
Severe myopia	5.2%	6.3%	4.1%
Adults with Learning Disabilities in the Population			
Age 20-49			
Visual impairment (excluding blind)	4.80%	6.15%	3.55%
Blind	1.67%	2.48%	0.86%
Refractive error	55.83%	58.97%	52.69%
Severe hyperopia	3.0%	3.9%	2.2%
Severe myopia	2.1%	2.8%	1.4%
Age 50+			
Visual impairment (excluding blind)	10.86%	13.40%	8.32%
Blind	2.79%	4.13%	1.45%
Refractive error	56.45%	60.49%	52.41%
Severe hyperopia	3.0%	3.9%	2.2%
Severe myopia	2.2%	2.9%	1.5%

Findings

In the following pages we present Tables and Figures showing the results of our estimates of the number of people with learning disabilities who have visual impairment, blindness, myopia and hyperopia and (for adults only) total refractive error in the UK over the period 2011-2031. These estimates are broken down in the tables by crude age group and for each of the constituent countries of the UK. The Figures show UK only estimates with 95% confidence intervals.

Table 5: Point Estimates of the Number of People with Learning Disabilities Known to Services with Visual Impairment (Excluding Blindness) in the UK, 2011-2031							
		2011	2016	2021	2026	2031	CAGR
England	0-19	16,259	16,518	17,186	17,903	18,100	0.57%
	20-49	15,049	15,057	15,012	15,336	15,887	0.29%
	50+	11,016	11,948	12,760	13,056	13,174	0.95%
	Total	42,325	43,523	44,957	46,295	47,160	0.57%
Scotland	0-19	1,547	1,524	1,539	1,565	1,542	-0.02%
	20-49	1,462	1,420	1,379	1,378	1,391	-0.26%
	50+	1,179	1,273	1,338	1,336	1,318	0.59%
	Total	4,189	4,217	4,257	4,279	4,252	0.08%
Wales	0-19	941	930	945	976	978	0.21%
	20-49	797	790	784	796	820	0.15%
	50+	694	741	776	779	772	0.56%
	Total	2,431	2,460	2,505	2,551	2,570	0.29%
N Ireland	0-19	637	639	649	660	644	0.05%
	20-49	517	512	506	505	512	-0.05%
	50+	355	392	422	438	447	1.22%
	Total	1,509	1,543	1,577	1,603	1,603	0.32%
UK	0-19	19,384	19,611	20,319	21,104	21,264	0.49%
	20-49	17,825	17,779	17,681	18,014	18,610	0.23%
	50+	13,245	14,354	15,297	15,609	15,711	0.90%
	Total	50,454	51,744	53,297	54,728	55,585	0.51%

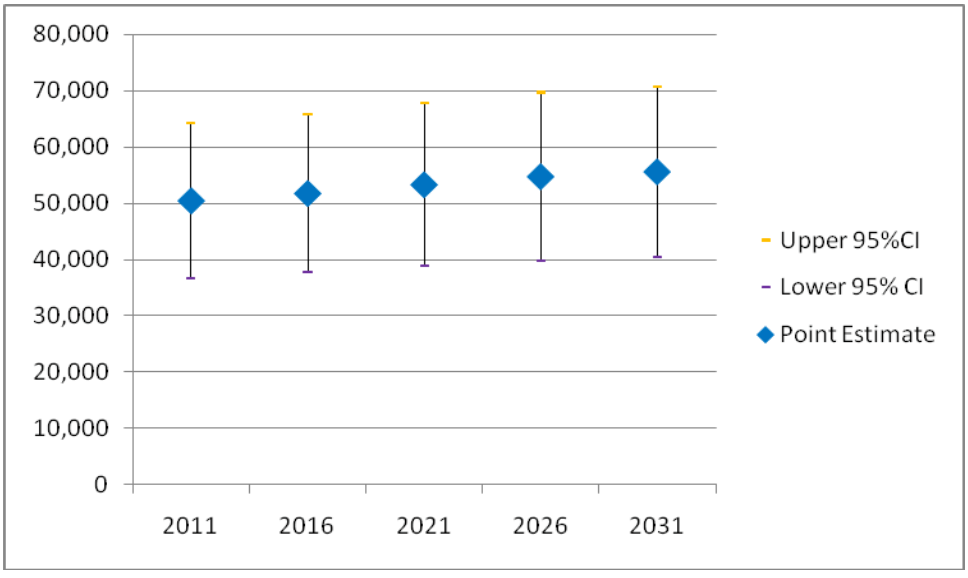

Figure 1: Estimates of the Number of People with Learning Disabilities Known to Services with Visual Impairment in the UK, 2011-2031

Table 6: Point Estimates of the Number of People with Learning Disabilities in the Population with Visual Impairment (Excluding Blindness) in the UK, 2011-2031							
		2011	2016	2021	2026	2031	CAGR
England	0-19	16,259	16,518	17,186	17,903	18,100	0.57%
	20-49	25,441	25,577	25,512	25,968	26,849	0.28%
	50+	37,053	40,325	43,380	45,110	46,457	1.20%
	Total	78,754	82,420	86,077	88,982	91,405	0.79%
Scotland	0-19	1,547	1,524	1,539	1,565	1,542	-0.02%
	20-49	2,467	2,408	2,339	2,330	2,348	-0.26%
	50+	3,925	4,250	4,514	4,598	4,657	0.90%
	Total	7,939	8,182	8,392	8,493	8,547	0.39%
Wales	0-19	941	930	945	976	978	0.21%
	20-49	1,344	1,341	1,332	1,346	1,382	0.15%
	50+	2,343	2,521	2,670	2,733	2,772	0.89%
	Total	4,628	4,791	4,947	5,055	5,133	0.55%
N Ireland	0-19	637	639	649	660	644	0.05%
	20-49	874	869	858	853	864	-0.06%
	50+	1,178	1,306	1,420	1,499	1,560	1.49%
	Total	2,690	2,814	2,927	3,012	3,068	0.70%
UK	0-19	19,384	19,611	20,319	21,104	21,264	0.49%
	20-49	30,127	30,195	30,042	30,497	31,443	0.23%
	50+	44,499	48,402	51,983	53,940	55,446	1.16%
	Total	94,010	98,207	102,344	105,542	108,153	0.74%

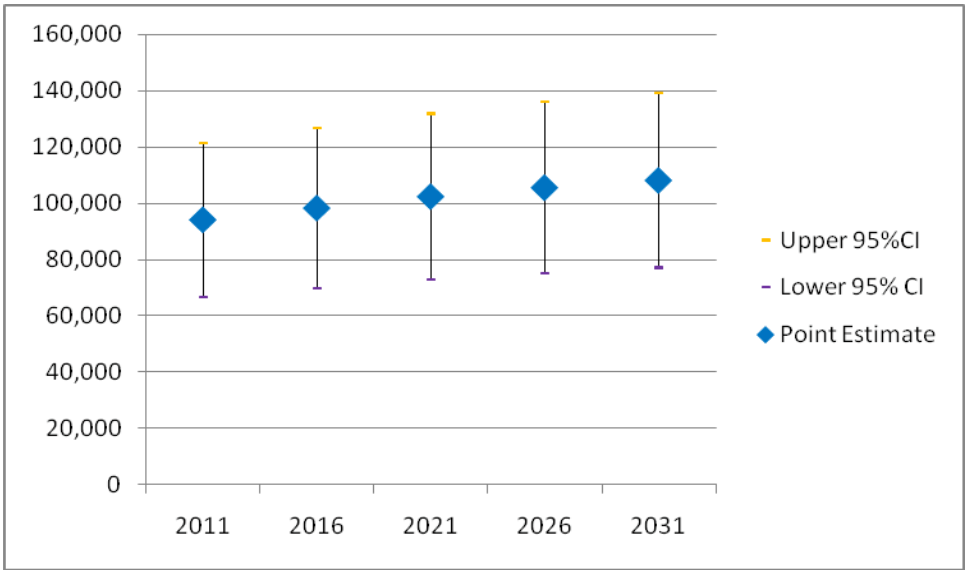

Figure 2: Estimates of the Number of People with Learning Disabilities in the Population with Visual Impairment in the UK, 2011-2031

Table 7: Point Estimates of the Number of People with Learning Disabilities Known to Services with Blindness in the UK, 2011-2031							
		2011	2016	2021	2026	2031	CAGR
England	0-19	3,180	3,230	3,361	3,501	3,540	0.57%
	20-49	6,388	6,391	6,372	6,509	6,743	0.29%
	50+	2,711	2,940	3,140	3,213	3,241	0.95%
	Total	12,278	12,561	12,872	13,223	13,524	0.51%
Scotland	0-19	302	298	301	306	302	-0.02%
	20-49	621	603	585	585	591	-0.26%
	50+	290	313	329	329	324	0.59%
	Total	1,213	1,214	1,216	1,220	1,217	0.01%
Wales	0-19	184	182	185	191	191	0.21%
	20-49	338	335	333	338	348	0.15%
	50+	171	182	191	192	190	0.56%
	Total	693	699	709	720	729	0.27%
N Ireland	0-19	125	125	127	129	126	0.05%
	20-49	219	217	215	214	217	-0.05%
	50+	87	96	104	108	110	1.22%
	Total	431	439	446	451	453	0.26%
UK	0-19	3,791	3,835	3,974	4,127	4,158	0.49%
	20-49	7,566	7,546	7,505	7,647	7,899	0.23%
	50+	3,259	3,532	3,764	3,841	3,866	0.90%
	Total	14,616	14,913	15,242	15,614	15,923	0.45%

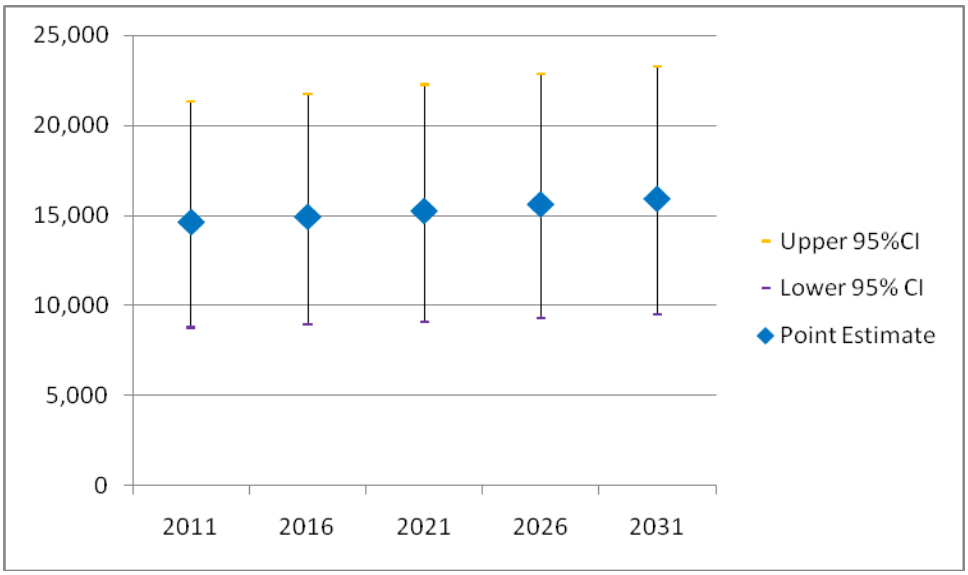

Figure 3: Estimates of the Number of People with Learning Disabilities Known to Services with Blindness in the UK, 2011-2031

Table 8: Point Estimates of the Number of People with Learning Disabilities in the Population with Blindness in the UK, 2011-2031							
		2011	2016	2021	2026	2031	CAGR
England	0-19	3,180	3,230	3,361	3,501	3,540	0.57%
	20-49	8,852	8,899	8,876	9,035	9,341	0.28%
	50+	9,519	10,360	11,145	11,589	11,935	1.20%
	Total	21,550	22,489	23,381	24,125	24,816	0.75%
Scotland	0-19	302	298	301	306	302	-0.02%
	20-49	858	838	814	811	817	-0.26%
	50+	1,008	1,092	1,160	1,181	1,196	0.90%
	Total	2,169	2,228	2,275	2,298	2,315	0.34%
Wales	0-19	184	182	185	191	191	0.21%
	20-49	467	466	463	468	481	0.15%
	50+	602	648	686	702	712	0.89%
	Total	1,253	1,296	1,334	1,361	1,385	0.53%
N Ireland	0-19	125	125	127	129	126	0.05%
	20-49	304	302	299	297	301	-0.06%
	50+	303	336	365	385	401	1.49%
	Total	731	763	790	811	827	0.65%
UK	0-19	3,791	3,835	3,974	4,127	4,158	0.49%
	20-49	10,482	10,505	10,452	10,611	10,940	0.23%
	50+	11,432	12,435	13,355	13,858	14,244	1.16%
	Total	25,704	26,775	27,780	28,595	29,342	0.70%

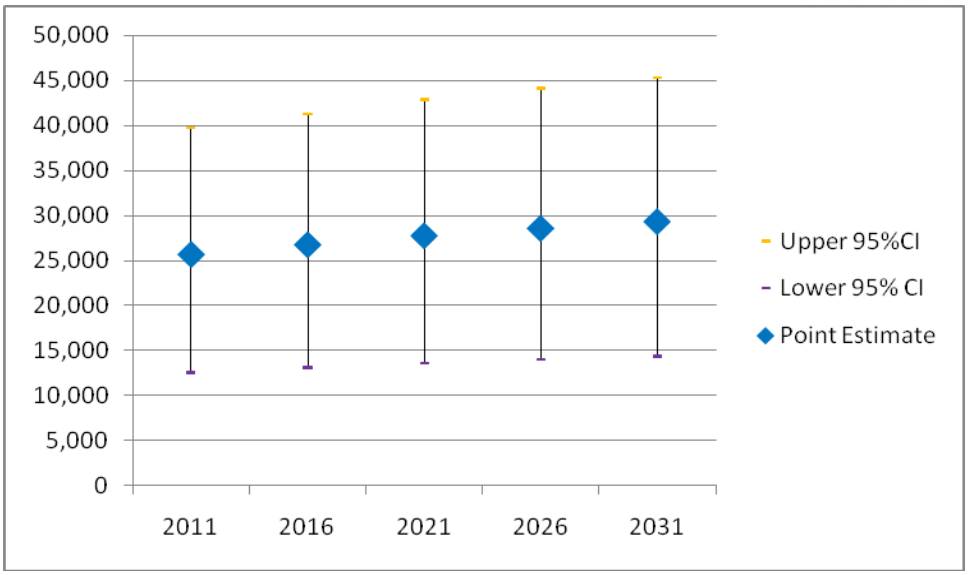

Figure 4: Estimates of the Number of People with Learning Disabilities in the Population with Blindness in the UK, 2011-2031

Table 9: Point Estimates of the Number of Adults with Learning Disabilities Known to Services with Refractive Error in the UK, 2011-2031							
		2011	2016	2021	2026	2031	CAGR
England	20-49	68,981	69,016	68,810	70,295	72,821	0.29%
	50+	33,481	36,312	38,779	39,681	40,038	0.95%
	Total	102,462	105,328	107,589	109,975	112,859	0.51%
Scotland	20-49	6,704	6,510	6,323	6,317	6,378	-0.26%
	50+	3,584	3,869	4,067	4,059	4,006	0.59%
	Total	10,288	10,379	10,390	10,376	10,384	0.05%
Wales	20-49	3,651	3,619	3,593	3,647	3,757	0.15%
	50+	2,109	2,253	2,360	2,367	2,347	0.56%
	Total	5,760	5,872	5,953	6,014	6,103	0.30%
N Ireland	20-49	2,369	2,348	2,320	2,315	2,348	-0.05%
	50+	1,079	1,192	1,284	1,332	1,359	1.22%
	Total	3,447	3,539	3,604	3,647	3,706	0.38%
UK	20-49	81,705	81,493	81,046	82,574	85,304	0.23%
	50+	40,253	43,625	46,490	47,439	47,749	0.90%
	Total	121,957	125,118	127,536	130,013	133,052	0.46%

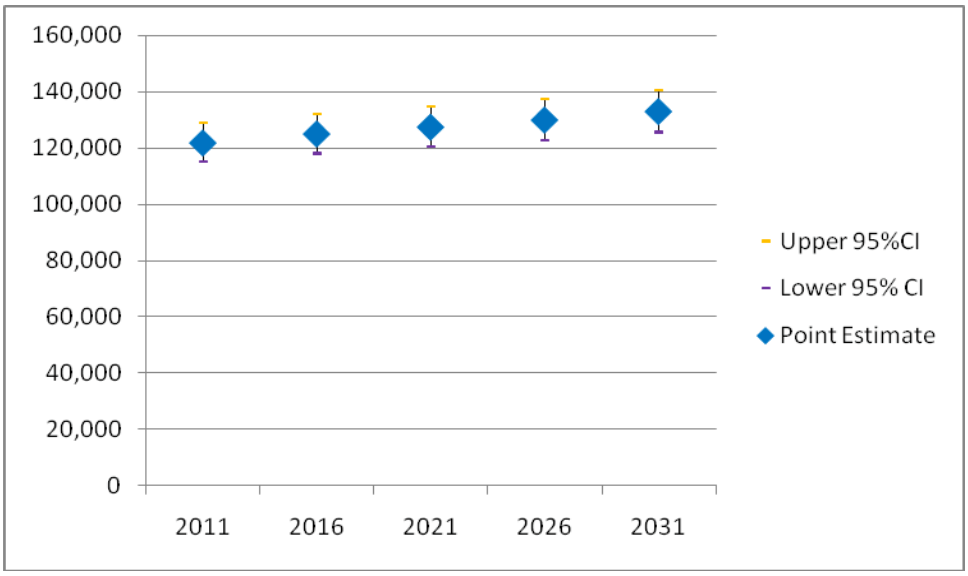

Figure 5: Estimates of the Number of Adults with Learning Disabilities Known to Services with Refractive Error in the UK, 2011-2031

Table 10: Point Estimates of the Number of Adults with Learning Disabilities in the Population with Refractive Error in the UK, 2011-2031							
		2011	2016	2021	2026	2031	CAGR
England	20-49	295,916	297,489	296,739	302,038	312,283	0.28%
	50+	190,484	207,307	223,010	231,907	238,830	1.20%
	Total	486,400	504,796	519,749	533,945	551,114	0.66%
Scotland	20-49	28,695	28,006	27,209	27,100	27,305	-0.26%
	50+	20,178	21,848	23,204	23,640	23,940	0.90%
	Total	48,873	49,854	50,414	50,740	51,245	0.25%
Wales	20-49	15,628	15,592	15,493	15,661	16,080	0.15%
	50+	12,046	12,958	13,727	14,050	14,252	0.89%
	Total	27,674	28,550	29,221	29,711	30,333	0.48%
N Ireland	20-49	10,170	10,113	9,981	9,924	10,055	-0.06%
	50+	6,056	6,714	7,300	7,704	8,020	1.49%
	Total	16,226	16,827	17,281	17,628	18,075	0.57%
UK	20-49	350,409	351,200	349,423	354,724	365,723	0.23%
	50+	228,764	248,827	267,241	277,300	285,042	1.16%
	Total	579,173	600,027	616,664	632,024	650,765	0.62%

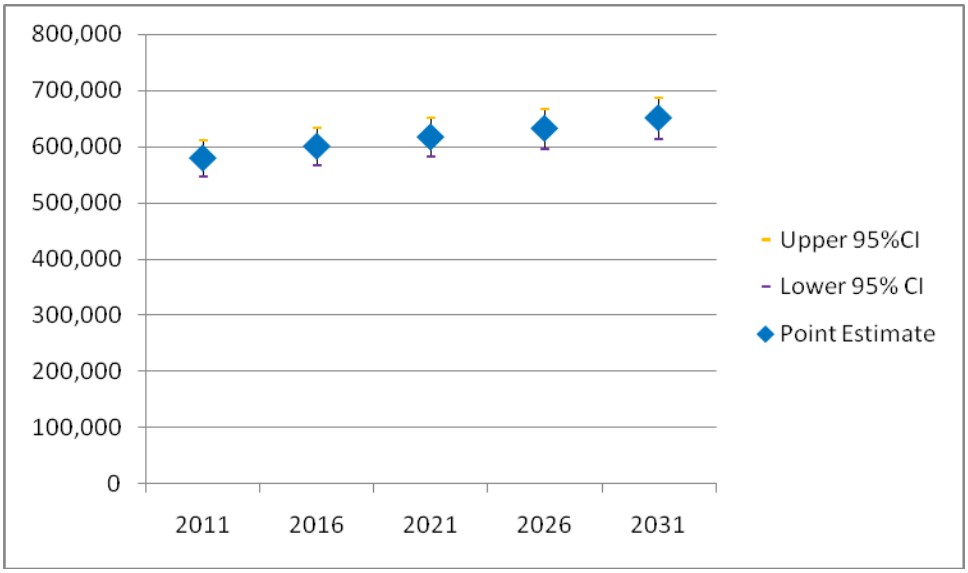

Figure 6: Estimates of the Number of Adults with Learning Disabilities in the Population with Refractive Error in the UK, 2011-2031

Table 11: Point Estimates of the Number of Children (Age 0-19) with Learning Disabilities with Myopia in the UK, 2011-2031						
	2011	2016	2021	2026	2031	CAGR
England	27,242	27,676	28,794	29,997	30,325	0.57%
Scotland	2,592	2,554	2,579	2,622	2,584	-0.02%
Wales	1,576	1,558	1,583	1,635	1,639	0.21%
N Ireland	1,068	1,070	1,087	1,106	1,079	0.05%
UK	32,478	32,857	34,043	35,360	35,627	0.49%

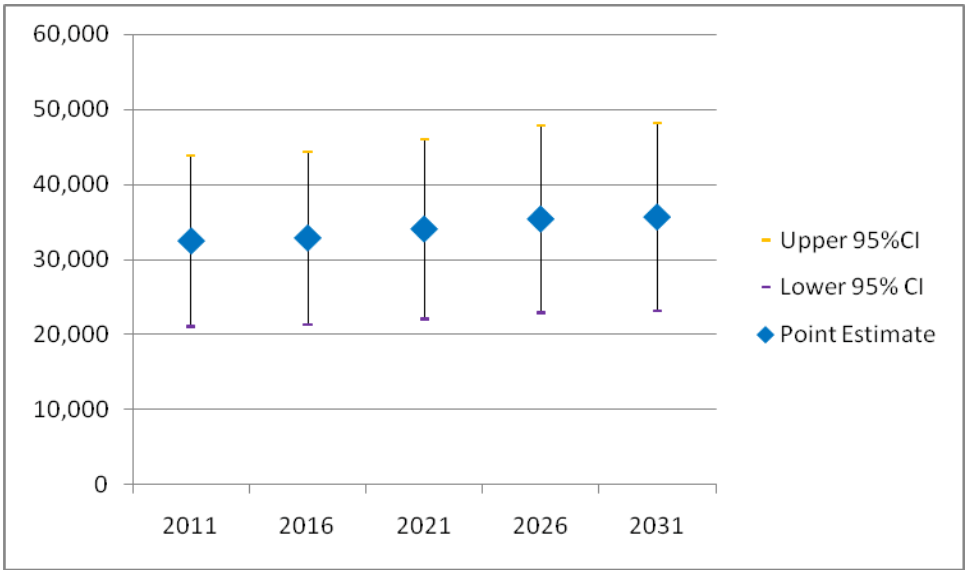

Figure 7: Estimates of the Number of Children (Age 0-19) with Learning Disabilities with Myopia in the UK, 2011-2031

Table 12: Point Estimates of the Number of Adults with Learning Disabilities Known to Services with Severe Myopia in the UK, 2011-2031

		2011	2016	2021	2026	2031	CAGR
England							
	20-49	6,054	6,057	6,039	6,169	6,391	0.29%
	50+	3,118	3,382	3,612	3,696	3,729	0.95%
	Total	9,173	9,439	9,651	9,865	10,120	0.52%
Scotland							
	20-49	588	571	555	554	560	-0.26%
	50+	334	360	379	378	373	0.59%
	Total	922	932	934	933	933	0.06%
Wales							
	20-49	320	318	315	320	330	0.15%
	50+	196	210	220	220	219	0.56%
	Total	517	527	535	541	548	0.31%
N Ireland							
	20-49	208	206	204	203	206	-0.05%
	50+	100	111	120	124	127	1.22%
	Total	308	317	323	327	333	0.40%
UK							
	20-49	7,171	7,152	7,113	7,247	7,487	0.23%
	50+	3,749	4,063	4,330	4,418	4,447	0.90%
	Total	10,920	11,216	11,443	11,666	11,934	0.47%

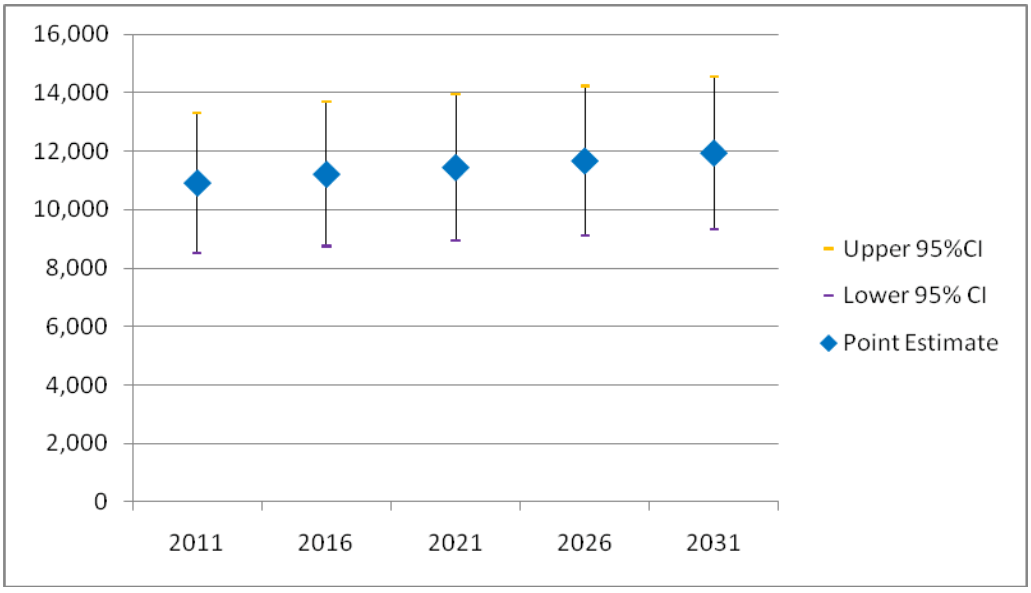

Figure 8: Estimates of the Number of Adults with Learning Disabilities Known to Services with Severe Myopia in the UK, 2011-2031

Table 13: Point Estimates of the Number of Adults with Learning Disabilities in the Population with Severe Myopia in the UK, 2011-2031							
		2011	2016	2021	2026	2031	CAGR
England							
	20-49	11,131	11,190	11,162	11,361	11,746	0.28%
	50+	7,506	8,169	8,788	9,138	9,411	1.20%
	Total	18,637	19,359	19,949	20,499	21,157	0.67%
Scotland							
	20-49	1,079	1,053	1,023	1,019	1,027	-0.26%
	50+	795	861	914	932	943	0.90%
	Total	1,874	1,914	1,938	1,951	1,970	0.26%
Wales							
	20-49	588	586	583	589	605	0.15%
	50+	475	511	541	554	562	0.89%
	Total	1,063	1,097	1,124	1,143	1,166	0.49%
N Ireland							
	20-49	383	380	375	373	378	-0.06%
	50+	239	265	288	304	316	1.49%
	Total	621	645	663	677	694	0.59%
UK							
	20-49	13,180	13,210	13,143	13,343	13,756	0.23%
	50+	9,015	9,805	10,531	10,927	11,232	1.16%
	Total	22,195	23,015	23,674	24,270	24,989	0.63%

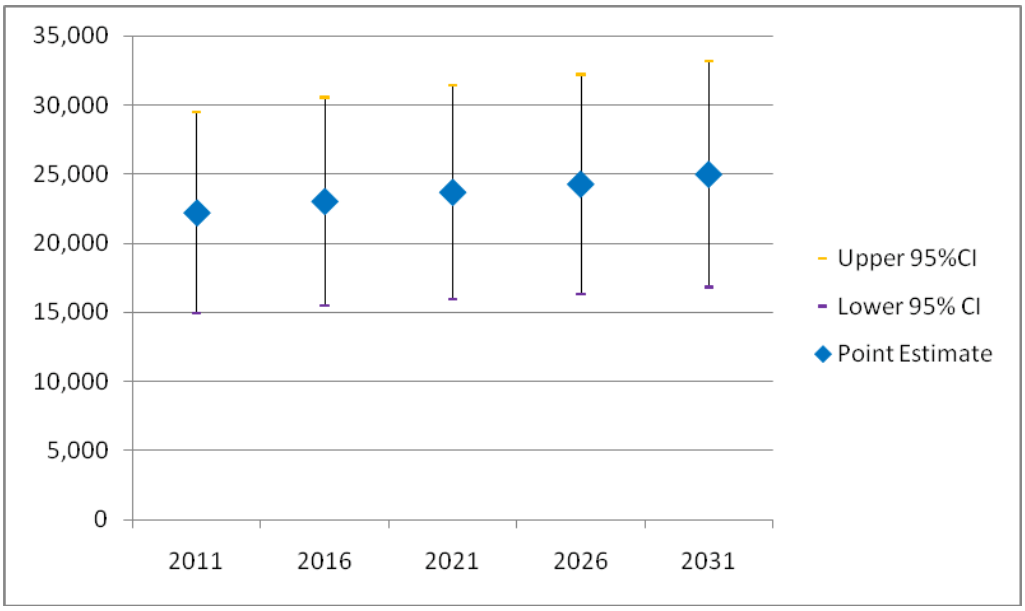

Figure 9: Estimates of the Number of Adults with Learning Disabilities in the Population with Severe Myopia in the UK, 2011-2031

Table 14: Point Estimates of the Number of Children (Age 0-19) with Learning Disabilities with Hyperopia in the UK, 2011-2031						
	2011	2016	2021	2026	2031	CAGR
England	46,526	47,267	49,177	51,231	51,792	0.57%
Scotland	4,426	4,361	4,405	4,478	4,413	-0.02%
Wales	2,692	2,660	2,704	2,793	2,800	0.21%
N Ireland	1,823	1,828	1,856	1,889	1,842	0.05%
UK	55,468	56,117	58,142	60,391	60,848	0.49%

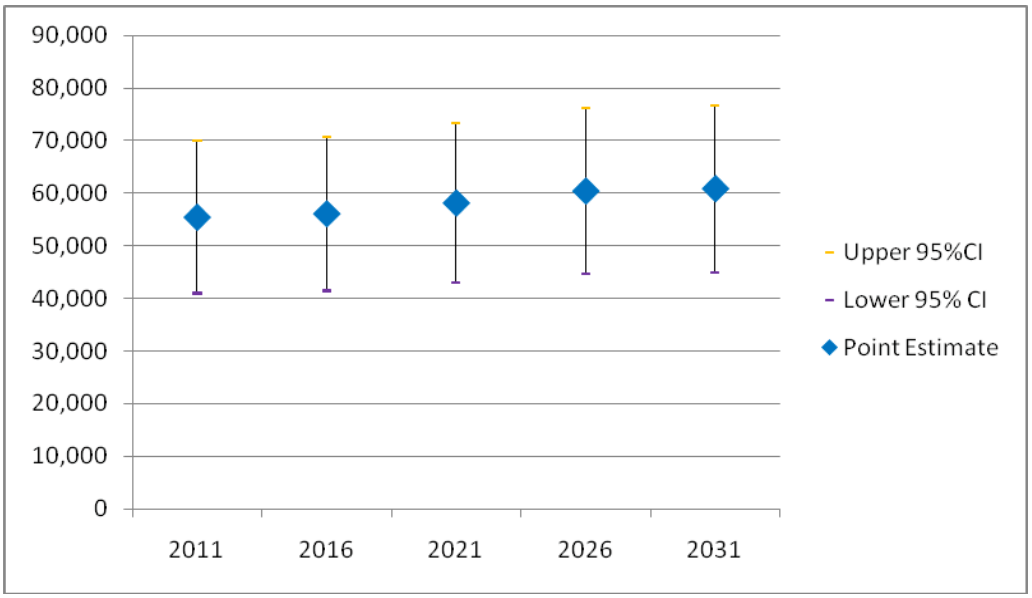

Figure 10: Estimates of the Number of Children (Age 0-19) with Learning Disabilities with Hyperopia in the UK, 2011-2031

Table 15: Point Estimates of the Number of Adults with Learning Disabilities Known to Services with Severe Hyperopia in the UK, 2011-2031							
		2011	2016	2021	2026	2031	CAGR
England							
	20-49	4,572	4,574	4,560	4,659	4,826	0.29%
	50+	2,399	2,602	2,778	2,843	2,869	0.95%
	Total	6,970	7,176	7,339	7,502	7,695	0.52%
Scotland							
	20-49	444	431	419	419	423	-0.26%
	50+	257	277	291	291	287	0.59%
	Total	701	709	710	709	710	0.06%
Wales							
	20-49	242	240	238	242	249	0.15%
	50+	151	161	169	170	168	0.56%
	Total	393	401	407	411	417	0.31%
N Ireland							
	20-49	157	156	154	153	156	-0.05%
	50+	77	85	92	95	97	1.22%
	Total	234	241	246	249	253	0.40%
UK							
	20-49	5,415	5,401	5,371	5,472	5,653	0.23%
	50+	2,884	3,126	3,331	3,399	3,421	0.90%
	Total	8,299	8,526	8,702	8,871	9,074	0.47%

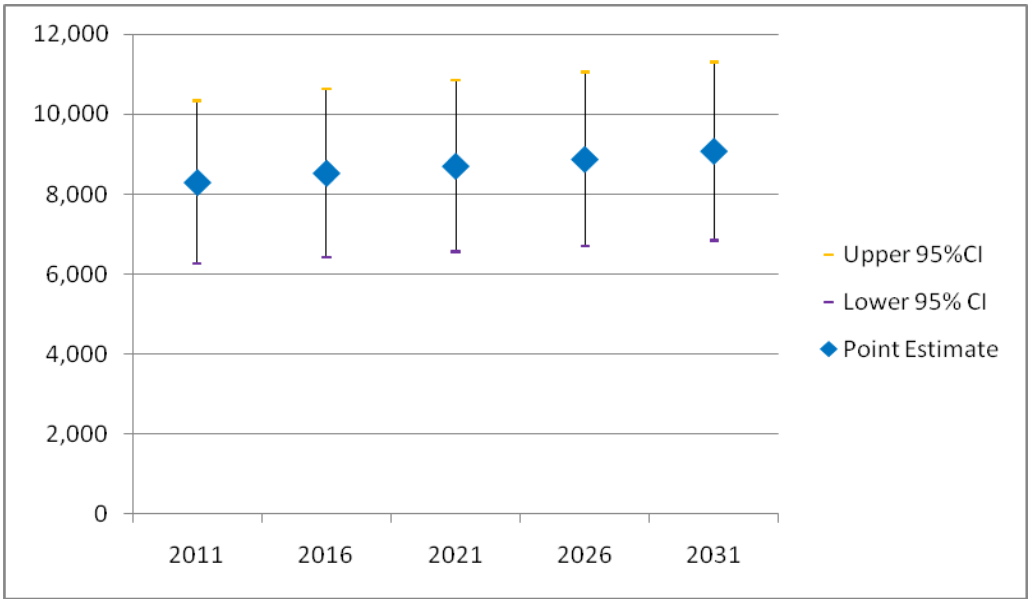

Figure 11: Estimates of the Number of Adults with Learning Disabilities Known to Services with Severe Hyperopia in the UK, 2011-2031

Table 16: Point Estimates of the Number of Adults with Learning Disabilities in the Population with Severe Hyperopia in the UK, 2011-2031							
		2011	2016	2021	2026	2031	CAGR
England							
	20-49	15,901	15,985	15,945	16,230	16,780	0.28%
	50+	10,236	11,140	11,983	12,461	12,833	1.20%
	Total	26,136	27,125	27,928	28,691	29,614	0.66%
Scotland							
	20-49	1,542	1,505	1,462	1,456	1,467	-0.26%
	50+	1,084	1,174	1,247	1,270	1,286	0.90%
	Total	2,626	2,679	2,709	2,726	2,754	0.25%
Wales							
	20-49	840	838	833	842	864	0.15%
	50+	647	696	738	755	766	0.89%
	Total	1,487	1,534	1,570	1,596	1,630	0.48%
N Ireland							
	20-49	546	543	536	533	540	-0.06%
	50+	325	361	392	414	431	1.49%
	Total	872	904	929	947	971	0.57%
UK							
	20-49	18,829	18,872	18,776	19,061	19,652	0.23%
	50+	12,293	13,371	14,360	14,901	15,317	1.16%
	Total	31,122	32,242	33,136	33,962	34,969	0.62%

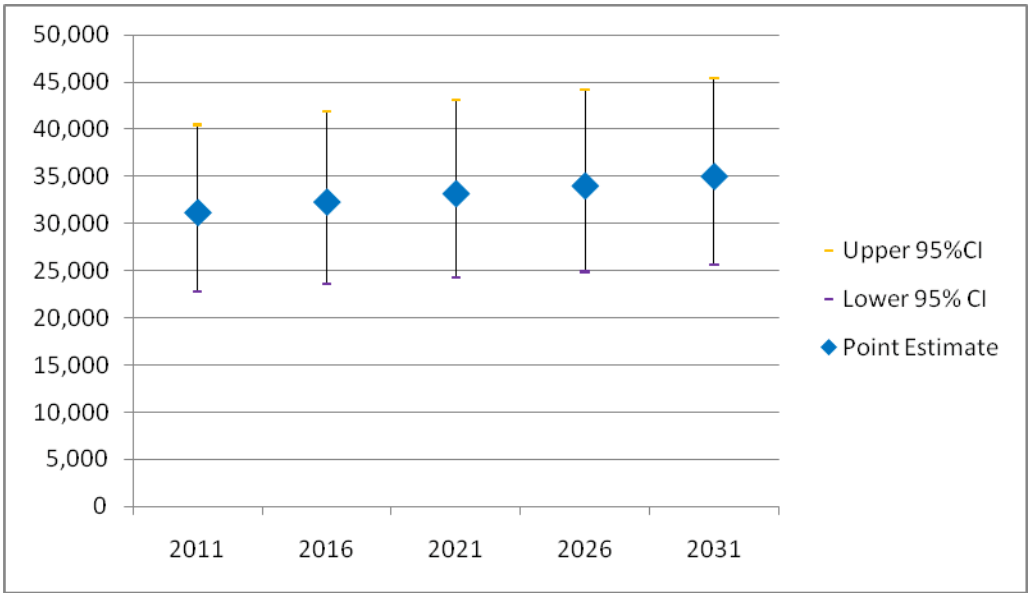

Figure 12: Estimates of the Number of Adults with Learning Disabilities in the Population with Severe Hyperopia in the UK, 2011-2031

Table 17: Point Estimates of the Number of Children (Age 0-19) with Learning Disabilities with Astigmatism in the UK, 2011-2031						
	2011	2016	2021	2026	2031	CAGR
England	86,951	88,336	91,904	95,744	96,792	0.57%
Scotland	8,272	8,151	8,233	8,368	8,248	-0.02%
Wales	5,031	4,971	5,054	5,220	5,232	0.21%
N Ireland	3,408	3,416	3,469	3,530	3,443	0.05%
UK	103,662	104,874	108,660	112,862	113,716	0.49%

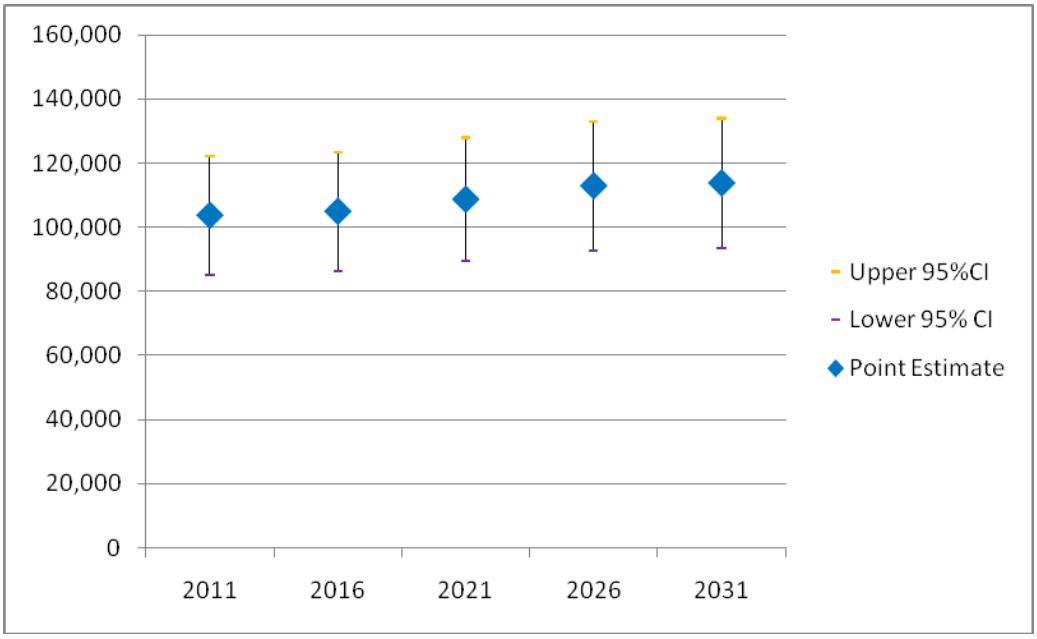

Figure 13: Estimates of the Number of Children (Age 0-19) with Learning Disabilities with Astigmatism in the UK, 2011-2031

Comments

The estimates contained in this report are based on a number of assumptions, some we believe to be highly robust, some less so. In Table 17 we list the key assumptions and data sources used and indicate the degree of confidence (from fair to very high) we feel can be placed in these assumptions/data. We also estimate the sensitivity of the predictions to any reasonably expected error in these assumptions (rated from very low to high).

Table 17: Assumptions and Data Included in the Projections

Assumption/Data	Confidence	Sensitivity
Age-specific general population predictions (2011-2031) published by the Office for National Statistics	Very high	Low
Prevalence of learning disabilities among children estimated from 2010 spring School Census data	Moderate to High	Low to Moderate
Prevalence and age profile of adults with learning disabilities known to services	High	Low to Moderate
Prevalence and age profile of adults with learning disabilities in the population	Moderate	Moderate to High
Prevalence of visual impairment among children with learning disabilities	Moderate	High
Prevalence of visual impairment among adults with learning disabilities	Moderate	High

As can be seen, the greatest degree of uncertainty (and therefore risk) in these estimates arises from two sources: (1) our estimates of the 'true' prevalence of learning disabilities in the UK; and (2) our estimates of the prevalence of visual impairment.

As we reported in the section on the process, estimating the 'true' prevalence of learning disabilities in the UK is problematic. While there can be no doubt that it is higher than the administrative prevalence (people known to learning disabilities services), it is difficult to estimate how much higher for two reasons. First, there is no 'official' data on true prevalence. Second, there is a lack of clarity within the UK on the definition of 'learning disabilities'.[16] While some definitions in use (e.g., the international 'gold standard' in the WHO's ICD-10)[17 18] are essentially IQ-based (assuming that all people with significant cognitive limitations will have difficulty adapting to social norms and conventions), others include the presence of deficits in 'adaptive behaviour' as an additional criterion. The definition we have used here is based on the ICD-10 approach and will give a higher estimate than definitions that include the presence of deficits in 'adaptive behaviour' as an additional criterion.

The estimates of the prevalence of visual impairment, while the best available, may also be prone to error. Neither of the studies were undertaken in the UK. Neither of the studies

employed large or fully representative samples. As a result of the modest sample sizes involved the confidence intervals for the projections are rather large. Nevertheless, these are the best estimates available and *are* consistent with the results of smaller scale UK studies.[13] Additional, large-scale research undertaken in the UK would be of considerable benefit in providing more robust estimates with narrower confidence intervals.

We have assumed that the prevalence rates of both learning disabilities and visual impairment among people with learning disabilities will remain unchanged over the next two decades. Whilst there is some evidence to suggest that the prevalence of profound multiple learning disabilities may be rising,[19] there is no robust evidence to suggest that the overall prevalence of learning disabilities is either rising or falling.[20] We did not include a specific correction factor for the possible impact of changes in the prevalence of profound multiple learning disabilities as: (1) people with profound multiple learning disabilities make up a very small proportion of people with learning disabilities; (2) estimates of visual impairment among people with profound multiple learning disabilities were either not provided within the studies we used or were based on very small samples. Any error in our current estimates resulting from this decision will marginally underestimate future growth in the prevalence of visual impairment among people with learning disabilities in the UK.

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