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CLINICAL STUDY

Leading causes of certifiable visual loss in England and Wales during the year ending 31 March 2013

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Abstract

Purpose **The last article on causes of sight impairment (SI) in England and Wales was for April 2007–March 2008. This report updates these figures for April 2012–March 2013.**
Methods **In England and Wales, registration for SI is initiated by completion of a certificate of vision impairment (CVI). The main cause of visual impairment was ascertained for certificates completed April 2012–March 2013. A proportional comparison against April 2007–March 2008 was made.**
Results **We received 24 009 CVIs of which 10 410 were for severe sight impairment (SSI) and 13 129 were for SI. These numbers were slightly higher than those observed in April 2007–March 2008 (9823 SSI; 12 607 SI). The ratio SI:SSI has remained static with 55% of all certifications being SI. The proportion of certificates without a single main cause has fallen slightly (16.6 to 14%). The proportion of certificates with a main cause of degeneration of the macula and posterior pole (mostly age-related macular degeneration (AMD)) decreased from 58.6 to 50% SSI and from 57.2 to 52.5% SI. Glaucoma remains the second most common cause (11% SSI; 7.6% SI) but hereditary retinal disorders overtook diabetes as third leading cause of SSI.**
Conclusion **AMD is still by far the leading cause of certifications for sight impairment in England and Wales (both SI and SSI). Proportionate changes have been observed since 2008, but it is important to note that a proportionate increase in one condition will impact on others.**

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Introduction

The number of blind people in Britain has been counted since 1851, and reports on the causes of low vision in England and Wales began in 1950.[1–8] Since 2005 in England and 2007 in Wales, registration as blind or partially sighted has been initiated by completion of a designated certificate – the Certificate of Vision Impairment (CVI) in England and the CVI-W in Wales. Copies of each form are sent for epidemiological analysis to the Certifications Office, London. The last complete report on causes of blindness in England and Wales was for data collected during 1 April 2007 and 31 March 2008.[9] This is a report of an analysis conducted on all CVIs and CVI-Ws, with certification dates between 1 April 2012 and 31 March 2013, which arrived at the Certifications Office London before November 2013 (at which point the data set was locked).

Materials and methods

Methods relating to capture of data have been described in detail previously.[10] Double data entry was conducted on a random sample of 2% of the forms and an error rate of <2% established. To facilitate comparison with previous analyses and to provide information for ophthalmologists of varying specialties, we coded data using the ICD-9,[11] tabulated the number of certificates attributed to each single main cause of visual impairment and present these numbers as percentages of the total number of certificates for blindness/partial sight. Single main cause is where the ophthalmologist indicated that that condition is responsible for sight loss. To avoid risk of disclosure figures below five are not reported. We calculated the proportion of forms in which a single cause had not been stated. Multiple causes are where the ophthalmologist did not indicate a single cause of visual loss. There may be differing causes in the two eyes or more than one cause within one eye and the ophthalmologist did not decide, which

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contributed most to certifiable visual loss. We tabulated multiple cause against age and visual status to assess whether or not this influenced the likelihood of multiple cause being recorded. We present figures for leading causes, including the number of certificates where this was the main cause of visual impairment and where a multiple cause had been recorded and that condition was a contributory diagnosis. This means that a certificate can contribute to more than one cause.

Results

We received 24 009 CVI certificates in the year ending March 2013, of which 10 410 were people certified with severe sight impairment (blindness; SSI) and 13 129 certified with sight impairment (partial sight; (SI). A total of 22 647 forms were completed in England and 1362 in Wales. An additional 470 (2%) forms did not state whether or not the individual was SSI or SI as compared with 755 (3.3%) of 23 185 CVIs completed during April 2007–March 2008. The single main causes of certifiable SSI are shown in Table 1. The number of forms lacking information on cause was slightly lower in the year ending 31 March 2013 as compared with the year ending 31 March 2008 (443 *vs* 507 forms). Figure 1a shows the relative percentages of the leading causes of certifiable SSI (where there is a single cause). The most commonly recorded main cause of certification for SSI was degeneration of the macula and posterior pole (ICD 362.5; 50%), which largely comprises age-related macular degeneration (AMD)—both neovascular, atrophic and mixed. This presents a decrease to what was seen in 2007–2008 where the figure for AMD was 58.6%. The figure for next most frequently occurring cause of blindness, glaucoma, has risen from 8.4% in 2007–2008 to 11% in 2012–2013. SSI certifications owing to hereditary retinal disorders have risen from 5.5% in 2007–2008 and to 8.2% in 2012–2013, which means that hereditary retinal disorders are now the third leading cause of SSI certifications. Thus, diabetes is displaced into fourth position being responsible for 5.4% of SSI certifications in 2013 compared to 6.3% in 2007–2008. Optic atrophy (4.9%), cerebrovascular disease (2.7%), disorders of visual cortex (2.6%), congenital anomalies (2.1%), and retinal vascular occlusions (2%) were the next frequently occurring

Table 1 Single main causes of severe sight impairment (blindness): certifications April 2012–March 2013

ICD -9	*Codes*	*Cause*	*Number*		*%*	
001–139, 771	53, 130, 136.1, 771.0	T: infections, congenital or acquired	8		0.09	
140–239	190, 190.5, 191, 239.9	T: all neoplasms	55		0.63	
	191	Malignant neoplasms of brain and nerve system		41		0.47
240–279		T: endocrine, Nutritional and Metabolic disease and immunity disorders	52		0.59	
	270.2	Albinism		52		0.59
320–326	282.5, 320, 323, 325	T: inflammatory diseases of the Central Nervous system	5		0.06	
340–349		T: other diseases of central nervous system	16		0.18	
360		T: rest of disorders of globe	109		1.25	
	360.2	Degenerative disorders of globe		99		1.13
361	361, 361.1, 361.8	T: retinal detachments and defects	60		0.69	
362		T: other retinal disorders	5818		66.56	
	362.0	Diabetic retinopathy		391		4.47
	34 000[a]	Diabetic Maculopathy		78		0.89
	362.3	Retinal vascular occlusion		175		2.00
	362.5	Degeneration of macula and posterior pole		4368		49.97
	362.7	Hereditary retinal dystrophies (eg Ushers)		722		8.26
363		T: chorioretinal inflammations, scars, and other disorders of choroid	38		0.43	
364		T: disorders of iris and ciliary body	10		0.11	
365		T: glaucoma	958		10.96	
	365.1	Open-angle glaucoma		816		9.34
	365.2	Primary angle-closure glaucoma		60		0.69
	35 000	Secondary Glaucoma		50		0.57
366	366, 366.1	T: cataract (excludes congenital)	31		0.35	
368		T: visual disturbances	13		0.15	
370–371		T: keratitis, corneal opacity and other disorders of cornea	129		1.48	
	371	Corneal opacity and other disorders of cornea		121		1.38
372–376		T: disorders of conjunctiva, eyelids and orbit	[b]		[b]	
377		T: disorders of optic nerve and visual pathways	730		8.35	
	377.1	Optic atrophy		431		4.93
	377.4	Other disorders of optic nerve		23		0.26
	377.7	Disorders of visual cortex		228		2.61
378		T: strabismus and disorders of binocular eye movements	[b]		[b]	
379	379.50, 379.51	T: other disorders of eye (except aphakia 379.3)	12		0.14	
430–438	430, 431, 437.1	T: cerebrovascular disease	236		2.70	
440–459		T: other circulatory disease	8		0.09	
740–759		T: congenital anomalies	183		2.09	
	742	Other congenital anomalies of nervous system		51		0.58
	743	Congenital anomalies of eye		129		1.48
760–779	Excludes 771	T: certain conditions originating in the perinatal period	46		0.53	
	760	Other congenital abnormalities		20		0.23
	33 000	Retinopathy of Prematurity		26		0.30
800–999		T: injuries and accident	23		0.26	
379.3		T: Aphakia/Pseudophakia	5		0.06	
	9000	No information on main Causes	192		2.20	
		Total	8741		100.00	

Abbreviation: T, total. [a]Codes in italics are not ICD-9 codes but were created for the CVI analysis. [b]Less than 5.

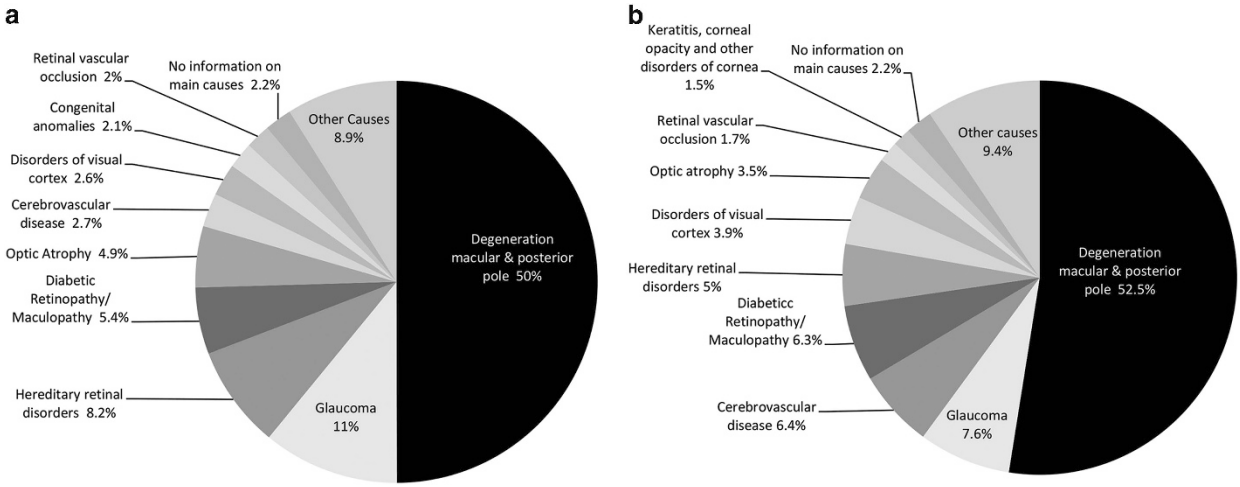

Figure 1 Main causes of (a) severe sight impairment (blindness) and (b) sight impairment (partial sight) in England and Wales: certifications April 2012–March 2013.

causes of certification for SSI, where there was a single cause.

The single main causes of certifiable SI are shown in Table 2. Figure 1b shows the relative percentages of the causes of SI certification. As for SSI, the most commonly recorded main cause of certification for SI was degeneration of the macula and posterior pole (52.5%)—a decrease from 57.2% in 2008. The next most common reported condition was glaucoma (7.6%) as was seen also in 2008 where it was responsible for 7.4% of SI CVIs. The third leading cause of SI was cerebrovascular disease, which accounted for 6.4% of SI CVIs in contrast to it contributing to 4.9% of SI CVIs. Diabetes is displaced into fourth leading cause accounting for 6.3% of SI CVIs as compared with 7.6% in 2008. Hereditary retinal disorders (5%), disorders of visual cortex (3.9%), optic atrophy (3.5%), and retinal vascular occlusion (1.7%) were the next frequently occurring causes of certification for SI, where there was a single cause.

AMD, glaucoma, hereditary retinal disorders, diabetic eye disease, optic atrophy and cerebrovascular disease accounted for 82.2% of SSI certifications and the most frequently occurring causes of SI certifications (81.7%) were AMD, glaucoma, cerebrovascular disease, diabetic eye disease, hereditary retinal disorders, and disorders of visual cortex, where there was a single cause.

In 14% of CVIs, there were multiple causes of visual impairment as compared with 16.6% of CVIs in 2008. Table 3 indicates that use of multiple cause was slightly more common in adults (14.8%) than in children (11%) and more common in SSI certificates (16%) than in SI certificates (13.4%).

Table 4 presents leading causes of certifiable sight impairment based both on single cause forms and multiple cause forms. Degeneration of the macular and posterior pole (mostly AMD) accounted for 5204 SSI forms and 6898 SI forms, with the majority of cases being due to a single cause. Glaucoma, however, occurred both as a single cause and as a contributory cause in fairly similar proportions for both SI and SSI certifications. Other causes such as Keratitis, corneal opacities and disorders of the cornea, occurred more commonly as a contributory cause than as a single cause.

Discussion

The aim of this paper is to provide updated figures on causes of certifiable vision impairment in England and Wales and to note proportional changes over a 5-year period, when the last complete analysis was reported. Any proportional comparison should be interpreted with caution as a decrease in one cause will cause a proportionate increase in other causes.

It is not surprising to see that AMD has decreased as a proportionate cause of sight impairment and this is most likely attributable to increasing availability of anti-VEGF drugs which have represented a step change in the management of neovascular AMD. Diabetes has also shown decreases as a proportional comparison and this is likely to reflect both better treatments and screening. Perhaps as a result of these changes, other conditions are emerging as prominent conditions to examine such as hereditary retinal disorders and cerebrovascular disease.

The CVI captures valuable epidemiological information on cause of sight loss but it should not be forgotten that its main function is to initiate registration as blind or partially sighted with the patients local Social Service department. Registration entitles the individual to a range of support including financial concessions and the loan of aids and equipment. A qualitative study conducted on recently

Table 2 Single main causes of sight impairment (partial sight): certifications April 2012–March 2013

ICD -9	*Codes*	*Cause*	*Number*		*%*	
001–139, 771	130, 135	T: infections, congenital or acquired	13		0.11	
140–239		T: all neoplasms	80		0.70	
	191	Malignant neoplasms of brain and nerve system		58		0.51
240–279		T: endocrine, Nutritional and Metabolic disease and immunity disorders	87		0.77	
	270.2	Albinism		87		0.77
320–326		T: inflammatory diseases of the Central Nervous system	[a]		[a]	
340–349		T: other diseases of central nervous system	13		0.11	
360		T: rest of disorders of globe	140		1.23	
	360.2	Degenerative disorders of globe		131		1.15
361		T: retinal detachments and defects	44		0.39	
362		T: other retinal disorders	7548		66.37	
	362.0	Diabetic retinopathy		548		4.82
	34 000[b]	Diabetic Maculopathy		163		1.43
	362.3	Retinal vascular occlusion		191		1.68
	362.5	Degeneration of macula and posterior pole		5972		52.51
	362.7	Hereditary retinal dystrophies (eg Ushers)		575		5.06
363		T: chorioretinal inflammations, scars, and other disorders of choroid	49		0.43	
364	364.3, 364.5	T: disorders of iris and ciliary body	15		0.13	
365		T: glaucoma	860		7.56	
	365.1	Open-angle glaucoma		764		6.72
	365.2	Primary angle-closure glaucoma		40		0.35
	35 000	Secondary Glaucoma		32		0.28
366	366, 366.5	T: cataract (excludes congenital)	41		0.36	
367	367, 367.0, 367.1, 367.2	T: disorders of refraction & accommodation	9		0.08	
368		T: visual disturbances	48		0.42	
	368.0	Amblyopia (Unspecified)		30		0.26
370–371		T: keratitis, corneal opacity and other disorders of cornea	172		1.51	
	371	Corneal opacity and other disorders of cornea		166		1.46
372–376		T: disorders of conjunctiva, eyelids and orbit	[a]		[a]	
377		T: disorders of optic nerve and visual pathways	922		8.11	
		Disorder of the optic nerve and visual pathways		39		0.34
	377.1	Optic atrophy		403		3.54
	377.7	Disorders of visual cortex		445		3.91
378		T: strabismus and disorders of binocular eye movements	[a]		[a]	
379		T: other disorders of eye (except aphakia 379.3)	116		1.02	
	379.5	Nystagmus and other irregular eye movements		111		0.98
430–438	430, 431	T: cerebrovascular disease	724		6.37	
440–459		T: other circulatory disease	[a]		[a]	
740–759		T: congenital anomalies	146		1.28	
	742	Other congenital anomalies of nervous system		38		0.33
	743	Congenital anomalies of eye		107		0.94
760–779	Excludes 771	T: certain conditions originating in the perinatal period	44		0.39	
	760	Other congenital abnormalities		24		0.21
800–999		T: injuries and accident	30		0.26	
379.3		T: Aphakia/Pseudophakia	10		0.09	
	9000	No information on main Causes	251		2.21	
		Total	11 372		100	

Abbreviation: T, total. [a]Less than 5. [b]Codes in italics are not ICD-9 codes but were created for the CVI analysis.

Table 3 Prevalence of multiple causes in certifiable vision impairment by age group and certification status: certifications April 2012–March 2013

Study factor		*Single cause*		*Multiple cause*	
		Number	Row %	number	Row %
Age at certification (years)	0–15	1104	89.0	136	11.0
	16–64	4100	85.4	702	14.6
	65–74	2070	85.2	359	14.8
	75–84	5288	84.8	947	15.2
	85 plus	7820	85.4	1341	14.6
Certification status	SSI	8741	84.0	1669	16.0
	SI	11 372	86.6	1757	13.4

certified patients reported that while certification was a life changing event, the help they received as a result substantially improved their lives.[12]

It is important to note that certification figures closely reflect new registrations with local authority Social Services registers but there remains uncertainty as to how well certification data map to the actual burden of sight loss in the population.[13,14] CVI data are, however, the source for the Public Health Outcome Framework indicators for sight loss in England reported annually online (CVI rates per 100k population at risk for AMD, Glaucoma, and Diabetic Eye Disease) and are also reported by the Welsh government. Patients, carers and researchers remain interested in rates for rarer conditions.[15] Work is currently underway on a temporal comparison of cause using the 2013–2014 data, this

Table 4 Numbers of SSI (blindness) and SI (partial sight) by cause, with that cause as the main cause of certifiable visual loss or with the main cause recorded as multiple but a contributory cause being that condition: certifications April 2012–March 2013

ICD-9	*Diagnosis*	*Single cause*	*Contributory cause*	*Total*
SSI				
362.5	Degeneration macular and posterior pole	4368	836	5204
365	Glaucoma	958	886	1844
362.7	Hereditary retinal disorders	722	141	863
362.0/34 000	Diabetic Retinopathy/ Maculopathy	469	214	683
377.1	Optic Atrophy	431	185	616
430–438	Cerebrovascular disease	236	107	343
377.7	Disorders of visual cortex	228	65	293
362.3	Retinal vascular occlusion	175	216	391
370–371	Keratitis, corneal opacity and other disorders of cornea	129	211	340
360.2	Myopia	99	105	204
	Total	7815	2966	10 781
SI				
362.5	Degeneration macular and posterior pole	5972	926	6898
365	Glaucoma	860	811	1671
430–438	Cerebrovascular disease	724	144	868
362.0/34 000	Diabetic Retinopathy/ Maculopathy	711	285	996
362.7	Hereditary retinal disorders	575	124	699
377.7	Disorders of visual cortex	445	71	516
377.1	Optic Atrophy	403	147	550
362.3	Retinal vascular occlusion	191	190	381
370–371	Keratitis, corneal opacity and other disorders of cornea	172	204	376
360.2	Myopia	131	118	249
	Total	10 184	3020	13 204

analysis will examine change in incidence rather than proportionate changes and allow an exploration of diagnosis with age.

Summary

What was known before

- The last report on causes of certified sight loss in England and Wales was for 2007–2008. AMD was the leading cause of certification.

What this study adds

- This report updates figures on leading causes of registrable blindness in England and Wales. AMD is still by far the leading cause and glaucoma is the next frequently occurring cause of sight loss certifications followed by hereditary retinal disorders for SSI (diabetic eye disease in 2007–2008) and cerebrovascular disease and diabetic eye disease for SI (diabetic eye disease and hereditary retinal disorders in 2007–2008).

Conflict of interest

The authors declare no conflict of interest.

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