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CLINICAL STUDY

Causes of blind and partial sight certifications in England and Wales: April 2007–March 2008

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Abstract

Purpose **The last complete report on causes of blindness in England and Wales was for the data collected during April 1999–March 2000. This study updates these figures, with data collected during April 2007–March 2008.**

Methods **In England and Wales, registration for blindness and partial sight is initiated with certification by a consultant ophthalmologist with the consent of the patient. The main cause of visual impairment was ascertained where possible for all certificates completed during April 2007–March 2008 and a proportional comparison with 1999–2000 figures was made.**

Results **We received 23 185 Certificates of Vision Impairment (CVIs), of which 9823 were for severe sight impairment (blindness) (SSI) and 12 607 were for sight impairment (partial sight) (SI). These totals were considerably lower than the numbers certified in the year ending 31 March 2000. In 16.6% of CVIs, there were multiple causes of visual impairment as compared with 3% of BD8s in 2000. Degeneration of the macula and posterior pole (mostly age-related macular degeneration (AMD)) contributed to vision impairment in 12 746 newly certified blind or partially sighted.**

Conclusions **AMD is still by far the leading cause of certified visual loss in England and Wales. Proportional comparisons are hampered by the increasing use of multiple pathology as a main cause of visual impairment, which is believed to have arisen owing to the change in certificate used for data collection. These figures are not estimates of the total numbers newly blind in the UK because not all those entitled to certification are offered and or accept it, but they do nevertheless document the number of people who are deemed to be sufficiently sight impaired to warrant support and have been both offered and accepted it. This is usually the case when no further ophthalmic intervention is thought likely to be of benefit in terms of restoring or improving vision.**

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Keywords: blind; registration; age-related macular degeneration; glaucoma; diabetic retinopathy

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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.[1–6] From the mid-1930s, registration as blind or partially sighted in England and Wales was initiated by completion of a designated certificate—the BD8, which required the signature of an ophthalmologist. Part 5 of the BD8 was an anonymous epidemiological return containing data on the cause of visual impairment, which was sent for analysis to the Office of Population Censuses and Surveys (OPCS)—now known as the Office of National Statistics (ONS).[7–9] In September 2005, the BD8 was replaced in England by the Certificate of Vision Impairment (CVI), with copies of the form being sent for epidemiological analysis to the Certifications Office, London. In April 2007, Wales released its equivalent form—the CVI-W. This is a report of an analysis conducted on all CVIs and CVI-Ws, with certification dates between 1 April 2007 and 31 March 2008, which arrived at the Certifications Office London before November 2008 (at which point the dataset was locked).

Table 1 Main causes of severe sight impairment (blindness): certifications April 2007–March 2008

ICD-9	*Codes*	*Cause*	*Number*		*%*	
001–139, 771	056, 771, 130	T: Infections, congenital or acquired	13		0.16	
140–239		T: All neoplasms	46		0.56	
	190.5	Retinoblastoma		6		0.07
	191	Malignant neoplasms of the brain and nervous system		25		0.31
	225, 234	All benign and uncertain behaviour neoplasms (excludes eye)		12		0.15
	239	Benign/uncertain neoplasms of the brain and nervous system		3		0.04
240–279	253,270,277	T: Endocrine, nutritional and metabolic disease, and immunity disorders	21		0.26	
	270.2	Albinism		19	0.00	0.23
320–326		T: Inflammatory diseases of the central nervous system	3		0.04	
340–349		T: Other diseases of the central nervous system	8		0.10	
	340	Multiple sclerosis		2		0.02
	343	Cerebral palsy		5		0.06
360		T: Rest of disorders of globe	107		1.31	
	360.2	Progressive myopia		100		1.22
361		T: Retinal detachments and defects	43		0.53	
362		T: Other retinal disorders	5958		72.88	
	362	Diabetic retinopathy		499		6.11
	34 000[a]	*Diabetic maculopathy*		17		0.21
	362.1	Other background retinopathy and vascular change		11		0.13
	362.3	Retinal vascular occlusion		144		1.76
	362.5	Degeneration of the macular and posterior pole		4788		58.58
	362.7	Hereditary retinal disorders		446		5.46
363		T: Chorioretinal inflammations and scars, and other disorders of the choroids	31		0.38	
	363.4	Choroidal degenerations				
	363.5	Hereditary choroidal dystrophies				
364		T: Disorders of iris and ciliary body	11		0.13	
365		T: Glaucoma	684		8.37	
	365.1	Open-angle glaucoma		572		7.00
	365.2	Primary angle closure glaucoma		41		0.50
	35 000	*Secondary glaucoma*		30		0.37
366		T: Cataract (excludes congenital)	25		0.31	
367		T: Disorders of refraction and accommodation	8		0.10	
	367.1	Myopia		8		
368		T: Visual disturbances	6		0.07	
	368	Amblyopia ex anopsia		3		
	368.4	Visual field defects		1		
370–371		T: Keratitis, corneal opacity and other disorders of the cornea	100		1.22	
	371	Scars and opacities of the cornea		86		1.05
	371.5	Hereditary corneal dystrophies		3		0.04
	371.6	Keratoconus		5		0.06
372–376		T: Disorders of conjunctiva, eyelids, and orbit	0			
377		T: Disorders of optic nerve and visual pathways	584		7.15	
	377.1	Optic atrophy		341		4.17
	377.3	Optic neuritis		12		0.15
	377.41	Ischaemic optic neuropathy		16		0.20
	377.7	Disorders of visual cortex (and cortical blindness)		192		2.35
	377.8	Optic neuropathy				
378		T: Strabismus and disorders of binocular eye movements	1		0.01	
379		T: Other disorders of eye (except aphakia 379.3)	11		0.13	
401–405		T: Hypertension	0			
430–438		T: Cerebrovascular disease	126		1.54	
440–459		T: Other circulatory disease	7		0.09	
	446.5	Giant cell arteritis		7		
694, 6	695.1	T: Cicatricial pemphigoid, erythema multiforme	4			
740–759		T: Congenital anomalies	110		1.35	
	742	Congenital anomalies of CNS		30		0.37
	743	T: Congenital anomalies of eye		78		0.95
760–779	Excludes 771	T: Certain conditions originating in the perinatal period	36		0.44	
	33 000	*Retinopathy of prematurity*		16	0.00	0.20
800–999		T: Injuries and accident	7		0.09	
25 000 and 379.3		T: Aphakia/pseuophakia	4		0.05	
	9000	*No information on main cause/illegible/invalid*	219		2.68	
		Total	8173		100.00	

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

Table 2 Main causes of sight impairment (partial sight): certifications April 2007–March 2008

ICD-9	*Codes*	*Cause*	*Number*	*%*
001–139, 771	042, 771, 130	T: Infections, congenital or acquired	5	0.05
140–239		T: All neoplasms	64	0.61
	190.5	Retinoblastoma	3	0.03
	191	Malignant neoplasms of the brain and nervous system	47	0.45
	194	Malignant neoplasms of pituitary gland	3	0.03
	225, 234	All benign and uncertain behaviour neoplasms (excludes eye)	8	0.08
	239	Benign/uncertain neoplasms of the brain and nervous system	3	0.03
240–279		T: Endocrine, nutritional and metabolic disease, and immunity disorders	70	0.67
	270.2	Albinism	70	0.67
320–326		T: Inflammatory diseases of the central nervous system	2	0.02
330–337	330, 333	T: Hereditary and degenerative diseases of the CNS	5	0.05
340–349		T: Other diseases of the central nervous system	9	0.09
	340	Multiple sclerosis	2	0.02
	343	Cerebral palsy	1	0.01
360		T: Rest of disorders of globe	143	1.36
	360.2	Progressive myopia	140	1.32
361		T: Retinal detachments and defects	39	0.37
362		T: Other retinal disorders	7452	71.01
	362	Diabetic retinopathy	765	7.29
	34 000[a]	*Diabetic maculopathy*	30	0.29
	362.1	Other background retinopathy and vascular change	15	0.14
	362.3	Retinal vascular occlusion	126	1.20
	362.5	Degeneration of the macular and posterior pole	6004	57.21
	362.7	Hereditary retinal disorders	443	4.22
363		T: Chorioretinal inflammations and scars, and other disorders of the choroids	34	0.32
	363.4	Choroidal degenerations	11	0.10
	363.5	Hereditary choroidal dystrophies	5	0.05
364		T: Disorders of iris and ciliary body	15	0.14
365		T: Glaucoma	772	7.36
	365.1	Open-angle glaucoma	683	6.51
	365.2	Closed-angle glaucoma	28	0.27
	35 000	*Secondary glaucoma*	26	0.25
366		T: Cataract (excludes congenital)	31	0.30
367		T: Disorders of refraction and accommodation	7	0.07
	367.1	Myopia		
368		T: Visual disturbances	41	0.39
	368	Amblyopia ex anopsia	23	0.22
	368.4	Visual field defects		
370–371		T: Keratitis, corneal opacity, and other disorders of the cornea	130	1.24
	371	Scars and opacities of the cornea	100	0.95
	371.5	Hereditary corneal dystrophies	7	0.07
	371.6	Keratoconus	11	0.10
372–376	376	T: Disorders of conjunctiva, eyelids, and orbit	1	0.01
377		T: Disorders of optic nerve and visual pathways	651	6.20
	377.1	Optic atrophy	308	2.93
	377.3	Optic neuritis	12	0.11
	377.41	Ischaemic optic neuropathy	8	0.08
	377.7	Disorders of visual cortex (and cortical blindness)	304	2.90
	377.8	Optic neuropathy		
378		T: Strabismus and disorders of binocular eye movements	2	0.02
379		T: Other disorders of eye (except aphakia 379.3)	88	0.84
	379.5	Nystagmus	87	0.83
430–438		T: Cerebrovascular disease	454	4.33
440–459		T: Other circulatory disease	2	0.02
	446.5	Giant cell arteritis	2	0.02
740–759		T: Congenital anomalies	141	
	742	Congenital anomalies of the CNS	34	0.32
	743	T: Congenital anomalies of the eye	104	0.99
760–779	Excludes 771	T: Certain conditions originating in the perinatal period	27	0.26
	33 000	*Retinopathy of prematurity*	12	0.11
800–999		T: Injuries and accident	20	0.19
	9000[a]	*No information on main cause/illegible/invalid*	288	2.74
		Total	10 495	100.00

Abbreviation: T, total.
[a]Codes in italics are not ICD-9, but were created for CVI analysis.

Materials and methods

An electronic version of the CVI, the ECVI, was used at the Certifications Office to transfer information from the paper-based certificates into a database. Data were coded using ICD-9 for ready comparison with the analysis conducted on the 1999–2000 data—the last causal analysis conducted.[10] Data entry for 5% of the forms was duplicated to check for the frequency of transcription and coding errors. Duplicate forms were then removed from the dataset.

Part C of the CVI form collects information on the cause of visual loss. It contains a picking list of common diagnoses and instructs the person completing the form to select main cause using an asterisk or circle. Guidelines are provided in the 'explanatory notes for consultant ophthalmologists' as to how to select a single main cause of visual loss where this is not evident.

Previous recent analyses on certification data were conducted on the main cause of blindness or partial sight. To facilitate comparison with these analyses and to provide information for ophthalmologists of varying specialties, we tabulated the number of certificates attributed to each main cause of visual impairment and show these numbers as percentages of the total number of certificates for blindness/partial sight (Tables 1 and 2).

For the CVI dataset however, the proportion of forms with the main cause of visual loss being recorded as 'multiple' cause was significantly higher than was the case for the BD8 forms, which were used for the 1999 report (16.6% *vs* just over 3%). Multiple causes are used where the ophthalmologist has not indicated 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 is unable to decide which contributes most to certifiable visual loss. While the BD8 prompted the ophthalmologist to enter a main cause using a single large text field on the form, the instructions on the CVI are less obvious, and while guidance is provided in the explanatory notes, these are unlikely to be readily available for the busy consultant in clinic. We tabulated multiple cause against age and visual status to assess whether or not this influenced the likelihood of multiple cause being recorded (Table 3).

Tables 4 and 5 presents 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.

Table 3 Prevalence of multiple causes in certifiable vision impairment by age group and certification status: certifications April 2007–March 2008

Study factor		*Single cause*		*Multiple cause*	
		Number	*Row %*	*Number*	*Row %*
Age at certification	0–15	849	85.4	145	14.6
	16–64	2968	85.0	523	15.0
	65–74	2088	82.4	445	17.6
	75–84	6028	83.0	1230	16.9
	85 plus	6291	82.1	1369	17.9
Certification Status	SSI	8173	83.2	1650	16.8
	SI	10 497	83.3	2110	16.7

Results

We received 23 185 CVI certificates dated between April 2007 and March 2008, of which 9823 were people certified with severe sight impairment (blindness) (SSI) and 12 607 certified with sight impairment (partial sight) (SI). An additional 755 (3.3%) forms did not state whether or not the individual was SSI or SI—this compares with 1515 (4.4%) of 34 410 BD8s completed during the period April 1999–March 2000.

Table 4 Numbers of SSI (blindness) CVIs by cause, with that cause as the main cause of CVI or with the main cause recorded as multiple, but a contributory cause being that condition: certifications April 2007–March 2008

ICD-9	*Diagnosis*	*Single cause*	*Contributory cause*	*Total*
362.5	Degeneration macular and posterior pole	4788	916	5704
365	Glaucoma	684	719	1403
362/34 000	Diabetic retinopathy/maculopathy	516	138	654
362.7	Hereditary retinal disorders	446	129	575
377.1	Optic atrophy	341	164	505
377.7	Disorders of visual cortex	192	94	286
362.3	Retinal vascular occlusion	144	243	387
430–438	Cerebrovascular disease	126	111	237
360.2	Myopia	100	95	196
370–371	Keratitis, corneal opacity, and other disorders of the cornea	100	150	250
		7437	2759	10 196

Abbreviation: CVI, certifiable visual loss.

Table 5 Numbers of SI (partial sight) CVIs by cause, with that cause as the main cause of CVI or with a main cause recorded as multiple, but a contributory cause being that condition

ICD-9	*Diagnosis*	*Single cause*	*Contributory cause*	*Total*
362.5	Degeneration macular and posterior pole	6004	1038	7042
365	Glaucoma	772	831	1603
362/34 000	Diabetic retinopathy/maculopathy	795	208	1003
362.7	Hereditary retinal disorders	443	140	583
377.1	Optic atrophy	308	181	489
377.7	Disorders of visual cortex	304	145	449
362.3	Retinal vascular occlusion	126	335	461
430–438	Cerebrovascular disease	454	212	666
360.2	Malignant myopia	140	100	240
370–371	Keratitis, corneal opacity, and other disorders of the cornea	130	179	309
		9553	3393	12 945

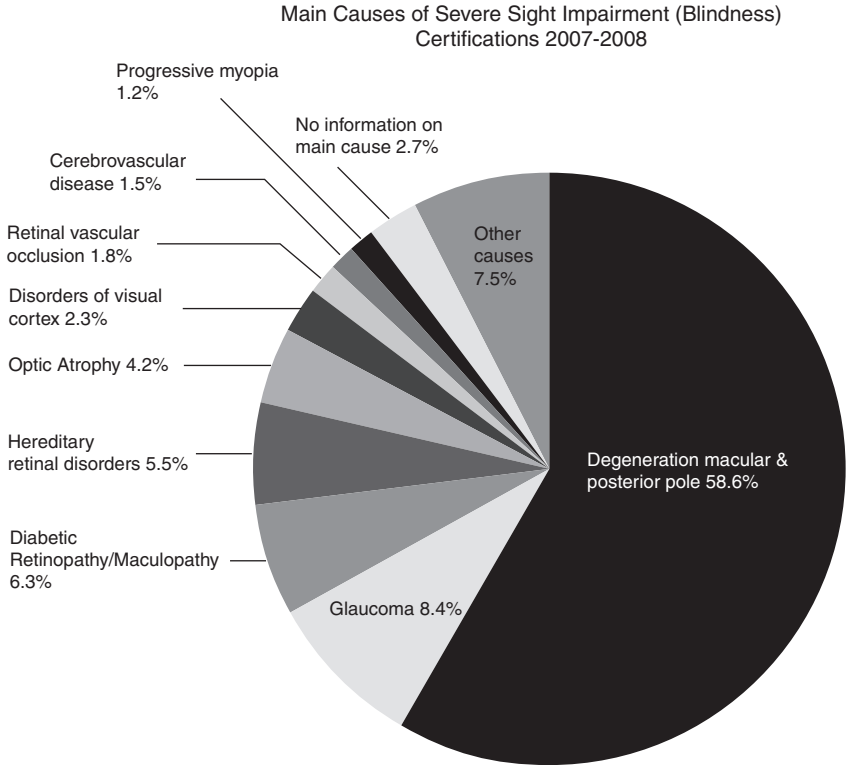

Figure 1 Main causes of severe sight impairment (blindness) in England and Wales: certifications April 2007–March 2008.

The main causes of certifiable SSI are shown in Table 1, columns 4 and 5 show the number of certificates attributed to each cause and columns 6 and 7 show these numbers as percentages of the total number of certificates for SSI.

Figure 1 shows the relative percentages of the leading causes of certifiable SSI. The most commonly recorded main cause of certification for SSI was degeneration of the macula and posterior pole (ICD 362.5) (58.6%), which largely comprises age-related macula degeneration. This was similar to what was seen in 1999–2000 where the figure for age-related macular degeneration (AMD) was 57.2%. As in 1999–2000, glaucoma (8.4%) and diabetic retinopathy (6.3%) were the next frequently occurring causes of certification for SSI, where there was a single cause. However, while in 1999–2000, hereditary retinal disorders were responsible for 2.8% of certifications for SSI, in 2007–2008, this figure has risen to 5.5%. Optic

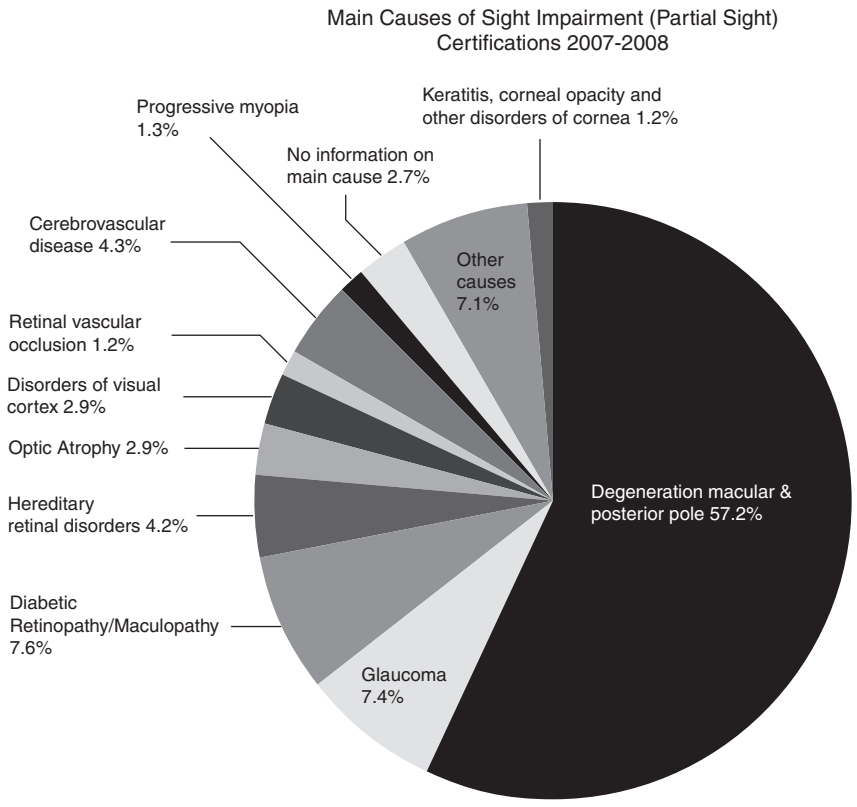

Figure 2 Main causes of sight impairment (partial sight) in England and Wales: certifications April 2007–March 2008.

atrophy (4.2%) and disorders of the visual cortex (2.3%) were the next frequently occurring causes of certification for SSI. Taken together, these accounted for over 80% of SSI certifications during the year.

The main causes of certifiable SI are shown in Table 2, columns 4 and 5 show the number of certificates attributed to each cause and columns 6 and 7 show these numbers as percentages of the total number of certificates for SI.

Figure 2 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 (57.2%). Diabetic eye disease (7.6%), glaucoma (7.4%), cerebrovascular disease (4.3%), hereditary retinal disorders (4.2%), and optic atrophy (2.9%) were frequently occurring causes of certification for SI, as for SSI.

There were 3859 forms received, which did not specify a main cause of certification, of these 1607 (41.6%) had a different cause in the right and left eye, and 2252 (58.4%) had more than one cause in at least one eye. Table 3 suggests that use of multiple cause was slightly more common in the older age groups, but was similar in SI and SSI certificates.

Tables 4 and 5 present leading causes of certifiable sight impairment based both on single cause forms and multiple case forms. As multiple pathology featured significantly more often in CVI data than BD8 data and because we believe that this is likely to reflect the change in mechanism for data capture, rather than a change in incident vision impairment, these figures should be adopted when comparing crude numbers by cause.

Discussion

The aim of this paper is to provide updated figures on causes of certifiable vision impairment in England and Wales and to highlight some of the issues that need to be addressed when comparing current crude estimates with previous years.

To facilitate comparison with the 1999–2000 data, we have presented the number of certificates attributed to each main cause of vision impairment and shown these numbers as percentages of the total number of certificates for SSI and SI. There are similarities in this analysis and the previous. AMD is by far the leading cause of all-ages certifications for SSI and SI. In 1999–2000, this condition

accounted for 57.2% of certifications for SSI, whereas in 2007–2008, it accounted for 58.6%. Unfortunately, neither the ICD-9 nor the ICD-10 coding classifications make the distinction between neovascular and geographic AMD. The CVI form does however, and work is currently underway at the Certifications Office so that figures by AMD type can be provided. As in 1999–2000, glaucoma (8.4%) and diabetic retinopathy (6.2%) were the next frequently occurring causes of certification for SSI. Changes are also seen however, with an increase in the proportion of forms attributed to hereditary retinal disorders. Proportionately, glaucoma has decreased slightly over the time period for SSI (10.9 to 8.4%) and for SI (10.2 to 7.4%).

It is important to note that, however, a proportional comparison requires caution, as an increase in one cause can result in a proportionate decrease in another cause.

This proportional comparison is further complicated by the increase in the proportion of forms where a main cause has not been identified. In the 1999–2000 dataset, which was derived from BD8s, approximately 3% of forms had a 'multiple cause'; in the 2007–2008 dataset, this has increased to 16.6%. There appeared to be a slight increase in the use of multiple causes with age, but the proportions of SI and SSI CVIs with multiple causes were similar.

As a result of this, we believe that when comparing numbers attributed to each cause over time, the figures given in Tables 4 and 5 should be cited. Temporal comparison of data is the focus of a future paper, but we feel it of value to put these figures in the public domain so that the ophthalmologists who complete the forms can see the value of their data. What cannot be overlooked, however, when making temporal comparisons, is the fact that the numbers being registered blind and partially sighted has significantly decreased and that this drop coincided with the launch of the new form. While this might reflect decreases in the numbers with newly incident blindness, anecdotal data and epidemiological modeling suggest that these numbers should be increasing. The numbers of certificates are significantly lower than were seen in 1999–2000, when 34 410 certificates were received—13 788 people were newly certified blind and 19 107 people were newly certified partially sighted. The numbers of certificates are also lower than the figures reported as registered at Social Services during the year ending 2006 when 10 820 subjects were registered blind and 14 375 were registered partially sighted.[11] It would appear therefore that certification and registration figures have fallen considerably over the last 10 years. The NHS Information Centre for health and social care have studied changes in registration figures between 2003, 2006, and 2008, and have found that blind and partial sight registrations have been decreasing in most age groups, yet have increased in the 17 and under age category (and for the 18–49 age group for partial sight).

Under-certification was reported as an issue for BD8 certificates and it appears that this is likely to be occurring with CVIs also.[12–17] It is almost certainly true that many people who are eligible for certification are not certified and that many people who are certified may not always satisfy the criteria for certification. These reasons are often used to devalue these data for epidemiological purposes, but we believe that it is still useful to have knowledge of the frequency and distribution of eye conditions, which cause sight loss of sufficient severity to warrant the offer and acceptance of registration. People who have lost vision are in need of support, and without a certification system, it is difficult to see how support will be activated or how their numbers can be monitored.

The CVI, like the BD8, was not piloted before being introduced, but with a move in the NHS to increasing use of IT, it is hoped that the whole process could be managed electronically with forced choice diagnostic categories and automated coding. The Certifications Office makes use of an electronic version of the CVI, which was developed as part of a project funded by Guide Dogs. Widespread implementation of this technology across the NHS will improve data collection and allow users to have a greater role in determining the contents of the CVI. We encourage people to continue completing the CVI and to adopt the electronic CVI where possible.

Summary

What was known before

- The last report on causes of registrable sight loss in England and Wales was for 1999–2000. 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. Overall numbers of registrations have fallen.

Conflict of interest

The authors declare no conflict of interest.

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