

Causes of blindness in Singapore

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Soon after the Second World War an attempt was made to maintain a count of blind persons in Singapore by the Department of Health (now Ministry of Health) but it was not until 1953 that a register of blind persons was started by the Singapore Association for the Blind. In that year Sir Clutha MacKenzie, himself blind, was sent out by the Technical Assistance Administration of the United Nations, at the request of the Governments of Singapore and the Federation of Malaya, to advise on a programme for the rehabilitation of the blind. MacKenzie's report (1953) contained an account given by the late Dr A D Williamson, eye surgeon at the General Hospital, on the chief sight destroying conditions then prevalent: "Keratomalacia, ophthalmia neonatorum, optic atrophy, cataract, congestive glaucoma, corneal ulceration, interstitial keratitis, iridocyclitis, penetrating wounds, intraocular tumours and trachoma were the chief causes" but no actual figures were given.

Definition of Blindness

There was no official definition of blindness in Singapore at that time. In October, 1955,

the Far East Conference on Work for the Blind met in Tokyo and recommended for recognition and implementation a definition that had been accepted by the World Council for the Welfare of the Blind:

"Resolution 1. Definition of Blindness

- (a) Total absence of sight, or
- (b) Visual acuity not exceeding 3/60 (a) or 10/200 (Smellen) in the better eye with correcting lenses, or
- (c) Serious limitation in the field of vision, generally not greater than 20 degrees".

In 1956, the Government of the Federation of Malaya accepted the definition under Resolution 1 of the Far East Conference but included the wider definition under (b) above. When this was communicated to the Government of Singapore, Singapore sought the view of Professor Arnold Sorsby as follows: "At the present time we have no official definition in Singapore but, presumably in the long run it would be wise to have the same definition in the Federation and Singapore." A reply from Sorsby could not be found on our records and Singapore, in fact, continued to follow the

definition of "economic blindness" in England, viz: "A person is considered blind if he is too blind to perform work for which eyesight is essential."

Registration

In practice, children were registered "blind" who had insufficient sight to receive education in normal schools and adults who had insufficient sight to enable them to have an occupation where vision was necessary; those so registered were categorised as "totally" or "partially" blind. Certification was performed by the Government ophthalmologists for the purpose of social aid, but as certification was not required by law, blind persons who were not referred by their private practitioners were not registered.

In 1964, a register was started for partially-sighted children. Concurrently, the practice of distinguishing "total" or "partial" blindness was discontinued and a person was registered "blind" when he had:

- (a) total absence of sight, or
- (b) visual acuity not exceeding 6/60 or 20/200 in the better eye with correcting lenses, or
- (c) visual acuity not exceeding 6/24 or 20/80 with a field defect of 10 degrees around fixation (20 degrees in diameter).

FINDINGS

Data from our registration for 1950-1964 (a 15 year period) and for 1965-1972 (a further 8 year period) are presented.

PREVALENCE

Table I shows that a total of 1,959 persons were registered and 517 deregistered for the period 1950-1972. The rate of 55 per 100,000 population in 1964 increased to 67 in 1972 based on a mid-year population of 1,841,600 and 2,147,400 respectively.

AGE AND SEX

The age and sex of the registered blind population in 1970 is shown in Table II: there was a slight preponderance of males (58%) over females (42%) with the largest numbers of both sexes in the elderly. The age at registration (not necessarily the same as age of onset) for the past 8 years, from 1965-1972,

is shown in Table III: the proportion was 22.5% for children, 34.3% for adults and 43.3% in the elderly.

CAUSES OF BLINDNESS

Table IV shows the number of blind persons found by cause. This is not to be regarded as a prevalence table but refers only to blind persons for which causes of blindness were available. The data is further analysed for 1950-1952 and subsequently quadrennially to show changes in cause over the past 23 years.

DISCUSSION

PAST: CHANGING PATTERN OF BLINDNESS

Congenital causes of blindness forming less than 10% prior to 1960 increased to 15% in 1964, 15.4% in 1968 and 24% in 1972 with proportionate decrease in acquired causes of blindness for the same period (Table IV). Of those born blind, the commonest cause were malformation (40%), congenital cataract (20%), optic atrophy (8%) and congenital glaucoma (5%). Of those who acquired blindness, glaucoma (28.6%) was the commonest cause prior to 1964, followed by optic atrophy (23.7%), corneal disease (18.5%) and retinal degeneration (9.6%); during 1965-1968 the acquired causes in order of frequency were glaucoma (26.6%), optic atrophy (25.9%), retinal degeneration (17.6%) and corneal disease (5.7%), but for the past four years from 1969-1972 the acquired causes were retinal disease (22%), glaucoma (20%), optic atrophy (20%) and corneal disease (12.3%). A rising figure is thus seen of those who were born blind and of those who acquired blindness retinal disease, glaucoma, optic atrophy and corneal disease remain the chief causes.

PRESENT: GEOGRAPHIC COMPARISON

Table V shows the chief causes of blindness in Singapore compared with other countries in the Asia Pacific area. A decline is seen in blindness due to infection and malnutrition: thus, Williamson observed in 1953 that keratomalacia, ophthalmia neonatorum and optic atrophy were the chief sight destroying conditions prevailing at that time; Loh reported in 1964 a decline in the incidence of keratomalacia; Lim in 1964 predicted that local causes of blindness were moving from the "primitive" to the "modern"; by 1972, we could hardly find

a case of acute trachoma (Jones, 1972) and xerophthalmia is virtually non-existent whilst trachoma and xerophthalmia is still prevalent in vast areas of India, Pakistan, China and Indonesia (Holmes 1972).

FUTURE: PROSPECTS

Congenital causes of blindness and acquired retinal disease have assumed local prominence but our prospects for our future lie in a long term preventive programme. For such a programme to succeed two factors are essential: the first is an awareness that eye diseases can cause blindness and this includes adequate training of medical personnel in recognising the blinding diseases in the country; the second is preventive measures and treatment, based on education, developed by research and directed towards the public in terms of educational campaigns backed up if necessary with legislation. This would include a study of the incidence and causes of blindness, the training of ophthalmologists and paramedical personnel, research into local causes of blindness, development of sophistication and maturity in ophthalmic practice and, finally, the education of the public.

SUMMARY

1. The incidence and causes of blindness in Singapore are reviewed for the past 23 years dating back to 1950 when registration commenced.
2. The changing pattern and local factors affecting it are compared with other countries.

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TABLE I
BLINDNESS IN SINGAPORE
BASED ON REGISTRATION, 1950 – 1972

<u>YEAR</u>	<u>NEW REGISTRATIONS</u>	<u>DEREGISTRATIONS</u>
1950	15	2
1951	19	3
1952	36	9
1953	121	34
1954	119	29
1955	162	48
1956	110	24
1957	89	16
1958	87	19
1959	129	19
1960	69	13
1961	52	10
1962	84	11
1963	69	4
1964	87	2
1965	105	55
1966	91	33
1967	89	42
1968	84	42
1969	93	29
1970	88	32
1971	63	29
1972	98	22
Total: 1950 to 1972	1959	517

TABLE II
NUMBER OF REGISTERED BLIND PERSONS IN SINGAPORE,
BY AGE AND SEX, 1970

<u>Age Group</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
Birth – 5	15	8	23
6 – 10	28	20	48
11 – 20	60	44	104
21 – 30	61	39	100
31 – 40	54	43	97
41 – 50	96	36	132
51 – 60	184	109	293
61 & above	289	304	593
Total:	802 (58%)	588 (42%)	1390

TABLE III

BLIND PERSONS IN SINGAPORE BY AGE AT REGISTRATION,
1965 – 1972

<u>YEAR</u>	<u>BIRTH TO 15 YEARS</u>	<u>16 TO 55 YEARS</u>	<u>56 AND ABOVE</u>	<u>TOTAL</u>
1965	18	39	48	105
1966	19	37	35	91
1967	20	30	39	89
1968	11	30	43	84
1969	21	30	42	93
1970	21	27	40	88
1971	20	19	24	63
1972	30	31	37	98
Total	160 (22.5%)	243 (34.2%)	308 (43.3%)	711

TABLE IV
BLINDNESS ACCORDING TO CAUSE, ANALYSED FOR 1950-72 AND
SUBSEQUENTLY QUADRENNIALLY, 1953-72
(NUMBERS AND PROPORTIONS BY CAUSE)

Cause of Blindness	1950-1952	1953-1956	1957-1960	1961-1964	1965-1960	1969-1972	Total
Congenital	2 2.8%	41 8%	41 10.9%	44 10.9%	57 15.4%	83 24.2%	268 13.7%
Acquired	68 97%	471 92%	333 89%	248 85%	312 85%	259 75.7%	1691 .86.3%
Cornal diseases	17 25%	117 24.8%	72 21.6%	46 18.5%	18 5.7%	32 12.3%	302 19.5%
Uveitis	1	28 5.9%	22 6.6%	10 4%	11 3.5%	10 3.8%	82 4.1%
Other in- flammation	2	26 5.5%	26 7.8%	10 4%	9 2.8%	3 1.1%	75 3.8%
Retinal de- generation	2	19 4%	25 7.5%	24 9.6%	55 17.6%	57 22%	180 9.1%
Cataract	1	23 4.8%	13 3.9%	23 9.2%	17 5.4%	15 5.8%	88 4.5%
Glaucoma	6 8.8%	98 20.8%	71 21.3%	71 28.6%	83 26.6%	52 20%	380 19.3%
Optic atrophy	10 14.7%	109 23%	81 24.3%	59 23.7%	81 25.9%	52 20%	389 19.8%
Trauma	0	4	5	5	6 1.9%	4	24 1.2%
Tumour	1	0	5	0	0	0	6 0.3%
Unknown	29 42.6%	49 10.4%	11 3.3%	0	0	0	88 4.4%
Total (con- genital & acquired)	70	512	374	292	369	342	1959

TABLE V

COMPARISON OF CHIEF CAUSES OF BLINDNESS
IN THE ASIA PACIFIC COUNTRIES

Country	Chief Cause of Blindness	Source and Year
India	1. Trachoma 2. Nutritional	Gupta, 1968
Indonesia	1. Xerophthalmia	Teng et al 1968
Japan	1. Cataract 2. Retinitis pigmentosa 3. Corneal 4. Trauma 5. Albinism 6. Optic atrophy 7. Glaucoma 8. Uveitis	Nakajima, 1972
Malaya	1. Trachoma 2. Xerophthalmia	Visvalingam, 1968
New Zealand Maori	1. Cataract 2. Trauma 3. Congenital 4. Uveitis	Fenwick & Sturman, 1968
Non-Maori	1. Senile macula degeneration 2. Glaucoma 3. Strabismus	
Pakistan	1. Trachoma 2. Xerophthalmia	Kirmani, 1968
Philippines	1. Cataract 2. Trauma 3. Glaucoma 4. Corneal 5. Retinal 6. Optic Nerve	De Ocampo, 1972
Republic of China	1. Phthisis bulbi 2. Cataract 3. Glaucoma 4. Corneal	Yang, 1968
Singapore	1. Retinal 2. Glaucoma 3. Optic atrophy 4. Corneal	Lim, 1974
Thailand	1. Cataract 2. Corneal 3. Trauma 4. Glaucoma	Limpaphayom & Wangspa, 1972