

4 Tabulated results

This chapter contains tables listing a summary of the review results, with separate tables for eye disease, injury, infection and tests. The data are organised by risk factor and then by condition:

- eye diseases (Table 4.1)
- eye injury (Table 4.2)
- refractive error (Table 4.3)

Tables 4.4 and 4.5 show the results for eye infections and eye tests, respectively.

Appendix 4 shows summary data extraction sheets for each risk factor and condition for which studies were found. A text overview of the key findings is presented in Section 5.

Table 4.1 Summary of results for eye diseases

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
Smoking	Cataract	Smoking is strongly associated with development of nuclear cataract, possibly associated with posterior subcapsular cataract and apparently not associated with cortical cataract. Risk increases with number of cigarettes smoked. Ex-smokers have a lower risk than current smokers, particularly after prolonged quitting.	1	1
Smoking	Amblyopia	No relevant studies found	7	NA
Smoking	Diabetic retinopathy	No relevant studies found	7	NA
Smoking	Glaucoma	A systematic review of cross-sectional and case-control studies showed a positive association between current smokers (but not past smokers) and glaucoma. However, a very large prospective cohort study, as well as two studies that were excluded from the systematic review, did not show this association and those with more than 10 pack-years of smoking experience had a reduced risk of glaucoma. (1 pack-year = 1 pack of cigarettes per day for 1 year)	5	4
Smoking	Age-related macular degeneration (AMD)	In two studies, current smoking was associated with an increased risk of developing AMD compared to past smokers and never smokers. Smoking is also associated with a progression to late AMD among those with early or intermediate AMD. For one study which did not show these effects, deaths from other causes may have masked the effect.	1	5
Smoking	Retinitis pigmentosa	No relevant studies found	7	NA
Smoking	Trachoma	No relevant studies found	7	NA
Age/ageing	Cataract	Prevalence of cataract increased with ageing, particularly post-60 years old when the prevalence increased from 1% to 12% at 65–69 years.	1	8
Age/ageing	Amblyopia	In a case-series of children with anisometropia, depth of amblyopia increased with ageing; prevalence also increased up to three years of age.	2	9
Age/ageing	Diabetic retinopathy	There are conflicting results as to whether or not age or ageing is associated with development of diabetic retinopathy. The best quality study in this group (Blue Mountains Eye Study) showed no statistically significant association with ageing. Further research is needed on the relationship between the incidence of DR with the time since onset of diabetes and an ongoing increase in DR with ageing in diabetic patients.	5	10
Age/ageing	Glaucoma	Cross sectional studies (level IV) show that prevalence of glaucoma (primary open-angle glaucoma, POAG) increases with ageing.	2	11
Age/ageing	AMD	Link already established	NA	NA
Age/ageing	Retinitis pigmentosa	No relevant studies found	7	NA
Age/ageing	Trachoma	No relevant studies found	7	NA
Alcohol	Cataract	Drinking increases the risk of nuclear, cortical and posterior subcapsular cataracts. Both the Blue Mountains Eye Study and the Beaver Dam Study found this effect at 'heavy' drinking levels, defined as ≥ 4 drinks/day (equivalent to approximately 280 g ethanol per week). However, a further study found that drinking at lower levels (≥ 91 g pure ethanol per week) increased the risk of posterior subcapsular opacities.	1	15

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
Alcohol	Amblyopia	No relevant studies found	7	NA
Alcohol	Diabetic retinopathy	Alcohol consumption may be associated with an increased risk of retinopathy in diabetics. More research is needed on the long-term effects of alcohol consumption on the noncardiac complications of diabetes mellitus.	2	17
Alcohol	Glaucoma	There are conflicting results on the effect that alcohol has on the development of glaucoma and its major risk factor, ocular hypertension.	5	18
Alcohol	AMD	The relationship between alcohol and AMD is difficult to evaluate due to the number of variables, including the different types and symptoms of AMD, definitions of alcohol intake and types of alcohol. However, the majority of the included literature suggests that drinking more than 6 beers per week increases the risk of developing drusen and drinking more than about 3 drinks per week, particularly of wine or spirits is associated with development of AMD.	2	19
Alcohol	Retinitis pigmentosa	No relevant studies found	7	NA
Alcohol	Trachoma	No relevant studies found	7	NA
Eye infections	Cataract	Eye infections (conjunctivitis and toxoplasmosis) appear to be linked to cataract.	2	22
Eye infections	Amblyopia	Amblyopia appears to occur in some cases of eye infection.	2	23
Eye infections	Diabetic retinopathy	Eye infection appears to be associated with the development of retinopathy in people with diabetes.	2	24
Eye infections	Glaucoma	A range of infectious agents (eg herpes zoster, cytomegalovirus and nematodes) appear to be associated with glaucoma.	2	25
Eye infections	AMD	There may be a link between infection with <i>Chlamydia pneumoniae</i> and macular degeneration.	2	26
Eye infections	Retinitis pigmentosa	No relevant studies found	7	NA
Eye infections	Trachoma	No relevant studies found	7	NA
UV damage	Cataract	A large number of epidemiological studies support an association between medium-wave ultraviolet light (UVB) and the development of cortical cataract.	1	36
UV damage	Amblyopia	No relevant studies found	7	NA
UV damage	Diabetic retinopathy	No relevant studies found	7	NA
UV damage	Glaucoma	No relevant studies found	7	NA
UV damage	AMD	Despite experimental evidence that the retina is susceptible to UV damage there has been no evidence that UV exposure per se is a risk for AMD. However, sunlight exposure in the teenage years and 30s is associated with increased risk of AMD-related pathologies (drusen and pigmentation) and early AMD. Other outdoor exposures did not increase risks (eg working outdoors). Wearing sunglasses and hats for at least half the time was protective for people with the highest levels of exposure when measured at 10 years (but not at five years).	2	40
UV damage	Retinitis pigmentosa	No relevant studies found	7	NA
UV damage	Trachoma	No relevant studies found	7	NA
UV damage	Pterygia	Current and past exposure to UV light appears to increase the population prevalence of pterygia and the risk of developing pterygia. Exposure to UV light also increases re-development of pterygia after surgical removal.	1	41

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
UV damage	Ocular surface neoplasia	Some epidemiology studies indicate that ocular surface neoplasms may be associated with exposure to UVB/sunlight. A causal effect of UV is further substantiated by molecular evidence of UV-induced mutations. Other risk factors include fair skin, light coloured iris, HIV infection, HPV infection and smoking.	1	42
Injuries and accidents	Cataract	Cataract can be caused by ocular trauma.	1	43
Injuries and accidents	Amblyopia	Ocular injuries and accidents can cause young children to develop amblyopia, either from visual deprivation or anisometropia. These injuries can have a wide range of causes, including dangerous toys and shaken baby syndrome.	1	44
Injuries and accidents	Diabetic retinopathy	No relevant studies found	7	NA
Injuries and accidents	Glaucoma	Glaucoma can occur as a complication of ocular trauma by a number of mechanisms. The risk of developing post-traumatic glaucoma after contusion is associated with increased age, poor visual acuity, iris injury, lens injury, hyphema and angle recession. The original trauma may be the result of any type of injury, including sporting injuries and automobile injuries.	1	46
Injuries and accidents	AMD	Macular degeneration does not appear to be linked to ocular injury.	4	47
Injuries and accidents	Retinitis pigmentosa	No relevant studies found	7	NA
Injuries and accidents	Trachoma	No relevant studies found	7	NA
Corticosteroids	Cataract	Inhaled corticosteroids may be associated with cataracts	2	50
Corticosteroids	Amblyopia	No relevant studies found	7	NA
Corticosteroids	Diabetic retinopathy	No relevant studies found	7	NA
Oral corticosteroids	Glaucoma	The use of oral glucocorticoids increases the risk of ocular hypertension or open-angle glaucoma in older people.	1	53
Topical corticosteroids	Glaucoma	The long-term use of potent formulations of topical corticosteroids near the eyes may increase the risk of glaucoma.	2	53
Inhaled corticosteroids	Glaucoma	Inhaled corticosteroid use may present an increased risk of glaucoma and ocular hypertension for people who are on high doses for long periods of time, or for those with a family history of glaucoma.	1	53
Corticosteroids	AMD	No association was found between the use of systemic anti-inflammatory medications and the cross-sectional incidence or prevalence of age-related macular degeneration.	4	54
Corticosteroids	Retinitis pigmentosa	No relevant studies found	7	NA
Corticosteroids	Trachoma	No relevant studies found	7	NA
High myopia	Cataract	Myopia, particularly high myopia, is associated with cortical, nuclear and posterior subcapsular cataract, although the causal mechanism remains unknown.	1	57
High myopia	Amblyopia	It is not clear whether children with high myopia are at increased risk of amblyopia.	5	58
High myopia	Diabetic retinopathy	The relationship between high myopia and diabetic retinopathy remains unclear.	5	59

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
High myopia	Glaucoma	There is an increased risk of POAG in myopic eyes. In studies of patients with ocular hypertension, myopic patients appear more susceptible to developing POAG than nonmyopic patients. Myopic patients may also be more likely to develop glaucoma early in life.	2	60
High myopia	AMD	Myopia does not appear to be a risk factor for age-related macular degeneration.	4	61
High myopia	Retinitis pigmentosa	No relevant studies found	7	NA
High myopia	Trachoma	No relevant studies found	7	NA
Ocular hypertension	Cataract	There are conflicting results from studies of possible links between ocular hypertension and development of cataract.	5	64
Ocular hypertension	Amblyopia	No relevant studies found	7	NA
Ocular hypertension	Diabetic retinopathy	No relevant studies found	7	NA
Ocular hypertension	Glaucoma	Increased ocular hypertension (OHT) can lead to glaucoma; treatment of even mild and moderate OHT may help to prevent the onset of glaucoma.	2	67
Ocular hypertension	AMD	No relevant studies found	7	NA
Ocular hypertension	Retinitis pigmentosa	No relevant studies found	7	NA
Ocular hypertension	Trachoma	No relevant studies found	7	NA
Poor living conditions	Cataract	It is not clear whether or not poor living conditions are linked to cataracts. Two studies found an association between low socioeconomic status and cataract (confined to nuclear cataract in one study and type not specified in the other) and a third study did not. Possible reasons for the discrepancy are the lack of a standard classification system for socioeconomic status, and the use of cataract surgery as a surrogate for cataract.	5	71
Poor living conditions	Amblyopia	No relevant studies found	7	72
Poor living conditions	Diabetic retinopathy	Lower socioeconomic status may be linked to a higher incidence of diabetic retinopathy.	2	73
Poor living conditions	Glaucoma	Low income may be associated with glaucoma.	2	74
Poor living conditions	AMD	It is not clear whether or not poor living conditions are associated with AMD. Two studies found an association between socioeconomic factors (income, education and occupation) and AMD; two did not. Possible reasons for the discrepancy are the lack of a standard classification system for socioeconomic status and the different factors measured in the different studies.	5	75
Poor living conditions	Retinitis pigmentosa	No relevant studies found	7	NA
Poor living conditions	Trachoma	No relevant studies found	7	NA
Diabetes	Cataract	Type 1 and type 2 diabetes are both significantly associated with cataract formation (all three types). If diagnosed early, diabetic cataract can be reversed with a change in diet and medication.	1	78
Diabetes	Amblyopia	No relevant studies found	7	NA
Diabetes	Diabetic retinopathy	Link already established	NA	NA

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
Diabetes	Glaucoma	A systematic review with meta-analysis indicates that diabetes is a risk factor for open-angle glaucoma; however, some prospective cohort studies suggest the opposite.	5	81
Diabetes	AMD	Diabetes appears not to be a risk factor for macular degeneration.	4	82
Diabetes	Retinitis pigmentosa	No relevant studies found	7	NA
Diabetes	Trachoma	There are high rates of diabetes in patients with trachoma, but causality is not clear. Both diseases are poverty-related and this single study looked at a very poor population. Diabetic retinopathy appears to make people more susceptible to poor visual acuity after trachoma.	2	84
Heredity	Cataract	Heredity is the major factor in determining cataract development.	1	85
Heredity	Amblyopia	Heredity strabismus appears to be linked with amblyopia.	2	86
Heredity	Diabetic retinopathy	No relevant studies found	7	NA
Heredity	Glaucoma	Development of primary open-angle glaucoma appears to be strongly linked to heredity factors in some cases. Secondary open-angle glaucoma may not be as strongly linked to heredity factors. Ethnic variations in physiology also account for differences in rates of glaucoma across different ethnic groups.	1	88
Heredity	AMD	No relevant studies found	7	NA
Heredity	Retinitis pigmentosa	No relevant studies found	7	NA
Heredity	Trachoma	No relevant studies found	7	NA
Hypertension	Cataract	There are conflicting results on the relationship between hypertension and cataract. Further studies are required, and should distinguish between different types of cataract in their analysis.	5	92
Hypertension	Amblyopia	No relevant studies found	7	NA
Hypertension	Diabetic retinopathy	Hypertension is a risk factor for retinopathy in both people with diabetes and people without diabetes.	1	94
Hypertension	Glaucoma	Ocular hypertension is a risk factor for glaucoma in the general population.	1	95
Hypertension	AMD	There may be an association between hypertension/blood pressure and age-related macular degeneration (AMD). One study showed no association between hypertension and ARM; others showed that hypertension/high blood pressure were risk factors for ARM/AMD. Beaver Dam Eye study had a smaller number of incident cases of ARM than Klein et al 2003 (see results column). Van Leeuwen study had a much larger study sample than other two studies (other 2 were of comparable size).	5	96
Hypertension	Retinitis pigmentosa	No relevant studies found	7	NA
Hypertension	Trachoma	No relevant studies found	7	NA
Squint	Cataract	No relevant studies found	7	NA
Squint	Amblyopia	Although there is debate about different intervention and screening programs, strabismus is clearly a cause of amblyopia.	1	100
Squint	Diabetic retinopathy	No relevant studies found	7	NA
Squint	Glaucoma	No relevant studies found	7	NA
Squint	AMD	No relevant studies found	7	NA

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
Squint	Retinitis pigmentosa	No relevant studies found	7	NA
Squint	Trachoma	No relevant studies found	7	NA
Anisometropia	Cataract	This study shows that anisometropia is associated with the presence of cataract. Further research would be required, however, to confirm causality.	2	106
Anisometropia	Amblyopia	It is well-established that anisometropia can lead to amblyopia, although it is not the only cause of this condition. Australian studies have shown that amblyopia is a significant cause of reduced visual acuity in the adult population.	1	107
Anisometropia	Diabetic retinopathy	No relevant studies found	7	NA
Anisometropia	Glaucoma	No relevant studies found	7	NA
Anisometropia	AMD	No relevant studies found	7	NA
Anisometropia	Retinitis pigmentosa	No relevant studies found	7	NA
Anisometropia	Trachoma	No relevant studies found	7	NA
Cataract	Amblyopia	Congenital cataracts cause abnormal or reduced visual stimulation during the sensitive period of visual development, which can result in amblyopia.	1	114
Cataract	Diabetic retinopathy	No relevant studies found	7	NA
Cataract	Glaucoma	No relevant studies found	7	NA
Cataract	AMD	It is not clear whether incidence of cataracts or cataract surgery is linked to age-related macular degeneration.	5	117
Cataract	Retinitis pigmentosa	No relevant studies found	7	NA
Cataract	Trachoma	No relevant studies found	7	NA
Physical activity	Cataract	Physically active people may be less likely to develop cataract than those who are inactive, although more research is needed.	6	120
Physical activity	Amblyopia	No relevant studies found	7	NA
Physical activity	Diabetic retinopathy	No relevant studies found	7	NA
Physical activity	Glaucoma	No relevant studies found	7	NA
Physical activity	AMD	Physical activity may have a protective effect against exudative AMD, independent of body mass index and other confounders.	6	124
Physical activity	Retinitis pigmentosa	No relevant studies found	7	NA
Physical activity	Trachoma	No relevant studies found	7	NA
Diet (Fruit and vegetables)	Cataract	These studies suggest that diet high in fruit and vegetables has a modest protective effect on cataract. This is especially true for spinach and kale, which are naturally high in the antioxidant lutein, found to be protective against nuclear cataract.	1	258
Diet (Glycaemic load)	Cataract	Glycaemic load does not appear related to the incidence of cataract.	4	258
Diet (Other nutrients)	Cataract	Other nutrients such as riboflavin, thiamin, vitamin C and vitamin E may protect against cataract but further studies are required.	2	258
Diet	Amblyopia	No relevant studies found	7	NA

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
Diet	Diabetic retinopathy	Although in vitro and animal studies have suggested that vitamins E and C may protect against the development of retinopathy, there is insufficient evidence from epidemiological studies to confirm this protective effect.	6	260
Diet	Glaucoma	These prospective studies suggest that diet, specifically fatty acids and antioxidants, is neither a causative nor a protective factor for primary open-angle glaucoma.	3	261
Diet	Macular degeneration	A low-fat, low-glycaemic diet high in fruit, fish and nuts may be protective against the onset of age-related macular degeneration. Other factors, such as zinc, coffee or carbohydrate intake, were not related to AMD. Further research is required before any supplements could be recommended.	6	262
Diet	Retinitis pigmentosa	No relevant studies found	7	NA
Diet	Trachoma	Numerous studies have shown that malnutrition predisposes an individual to infections, due to immunological deficits. Although malnutrition and trachoma share risk factors, such as poor hygiene and low socioeconomic status, this study did not find a direct causal relationship between malnutrition and trachoma.	4	264
Nutritional supplements	Cataract	Major studies show no association between vitamins E, C and β -carotene; vitamin E alone; vitamin C alone; or carotenoid supplements and the risk of any type of cataract development. One randomised controlled trial (RCT) from China and a number of observational studies have shown a reduction in all types of cataracts after multivitamin use or supplements with riboflavin and niacin. NB: Adverse effects of supplements need to be taken into account (eg β -carotene has been shown to increase risk of lung cancer in smokers; vitamin E has increased heart disease in people with vascular disease or diabetes).	6	222
Nutritional supplements	Amblyopia	No relevant studies found	7	NA
Nutritional supplements	Diabetic retinopathy	No relevant studies found	7	NA
Nutritional supplements	Glaucoma	Supplements (in the form of antioxidants) do not significantly reduce the risk of glaucoma.	3	224
Nutritional supplements	AMD	It is not clear whether supplements (vitamins, antioxidants, lutein, zeaxanthin and zinc) have a positive, negative or no effect on macular degeneration. Other adverse effects of supplements should be taken into account (eg β -carotene has been shown to increase risk of lung cancer in smokers; vitamin E has increased heart disease in people with vascular disease or diabetes).	5	226
Nutritional supplements	Retinitis pigmentosa	It is not clear whether lutein supplements are beneficial in retinitis pigmentosa. Docosa-hexaenoic acid (DHA, long chain omega-3 fatty acid) supplements do not appear to be beneficial.	5	227
Nutritional supplements	Trachoma	No relevant studies found	7	NA

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
Fatty acids	Cataract	Most types of dietary fat do not appear associated with cataract. The Nurses' Health Study found that high intakes of the 18-carbon polyunsaturated fatty acids linoleic acid and linolenic acid were significantly associated with the prevalence of nuclear opacities. This is supported by In vitro studies, which have demonstrated a potential mechanism for epithelial lens cell damage by polyunsaturated fatty acids. However, more detailed studies are required, particularly studies that separate different types of polyunsaturated fatty acids, as there is conflicting evidence from cross-sectional studies.	5	251
Fatty acids	Amblyopia	No relevant studies found	7	NA
Fatty acids	Diabetic retinopathy	No relevant studies found	7	NA
Fatty acids	Glaucoma	The association of fatty acids and glaucoma is unclear from this literature. Further randomised control trials would be required to support recommending fatty acids as a treatment.	5	254
Fatty acids	Macular degeneration	Although some studies suggest that omega 3 fatty acid consumption has a protective effect against AMD, the studies that have been done on this issue are not of very good quality and the results have been inconsistent. Further research with well-designed RCTs or prospective cohort studies is required to resolve this issue.	5	255
Fatty acids	Retinitis pigmentosa	Although trends of improvement in some retinitis pigmentosa outcomes were found in randomised control trials, more research is required in this area before fatty acids can be recommended as a therapy for retinitis pigmentosa.	6	256
Fatty acids	Trachoma	No relevant studies found	7	NA
Obesity	Cataract	Although causality has not been established, these studies suggest that obesity is associated with an increased risk of cataract, especially posterior subcapsular cataract.	2	244
Obesity	Amblyopia	No relevant studies found	7	NA
Obesity	Diabetic retinopathy	Abdominal obesity appears to be a risk factor for retinopathy in people with and without diabetes; however, body mass index is not.	2	246
Obesity	Glaucoma	Obesity does not appear to be a risk factor for glaucoma, although more research is required in this area.	4	247
Obesity	Macular degeneration	High body mass index (BMI) is a risk factor for visually significant AMD (but possibly not neovascular) in males; however, a low BMI is also associated with increased risk of visually significant ARM. A BMI within the normal range offers the lowest risk of ARM in men.	1	248
Obesity	Retinitis pigmentosa	No relevant studies found	7	NA
Obesity	Trachoma	No relevant studies found	7	NA

a Groups are as follows:

- Group 1 — Clear association/causality
- Group 2 — Possible association/causality (more research needed)
- Group 3 — Lack of association/causality
- Group 4 — Possible lack of association/causality (more research needed)
- Group 5 — Conflicting results
- Group 6 — Possible protection
- Group 7 — No studies

b Summary sheets number refers to the results tables in Appendix 3.

Table 4.2 Summary of results for eye injury

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
Eye protection	Eye injuries (impact, blunt force, foreign bodies)	Eye injury is associated with lack of eye protection, often occurs at work and is particularly prominent in young men. The use of eye protection leads to a marked decrease in eye injuries.	1	127
Eye protection	Chemical injury	No relevant studies found	7	NA
Eye protection	Radiation	No relevant studies found	7	NA
Occupation	Eye injury (impact, blunt force, foreign bodies)	Eye injury is a common hazard in certain jobs, and is particularly prominent in males between 20 and 34 years. Foreign bodies in the eye are the most common work-related injury. Regular wearing of appropriate eye protection can reduce the incidence of eye injury (see summary table 135).	1	135
Occupation	Chemical injury	Chemical injury to the eye is the second-most common cause of eye trauma, after foreign bodies. Males are more at risk from this type of injury than females.	1	137
Occupation	Radiation	No relevant studies found	7	NA
Sport	Impact/blunt force injury	A large proportion of injuries occur during sporting activity, with young men being most at risk. The sports resulting in the most number of injuries usually reflect their popularity in the country in question, rather than their inherent danger, although sports using hard, small balls warrant particular caution. Eye injury is less likely to occur in established sports with compulsory and well-designed eye protection.	1	139
Sport	Foreign bodies	Activities such as walking or running near roads may carry a small risk to eye health due to the potential for metallic foreign bodies to be projected from the road by passing cars.	2	140
Sport	Chemical injury	No relevant studies found	7	NA
Sport	Radiation	No relevant studies found	7	NA
Assault	Eye injury (impact, blunt force, foreign bodies, chemicals)	The type of eye injury resulting from an assault depends on the method of assault. Blunt trauma was the most common type of injury. Most assaults, particularly chemical assaults, result in serious injury or blindness. Further studies would be required to evaluate the severity and incidence of eye trauma from assault in Australia.	1	143
Assault	Radiation	No relevant studies found	7	NA
Alcohol consumption	Impact/blunt force injury	No relevant studies found	7	NA
Alcohol consumption	Foreign bodies	No relevant studies found	7	NA
Alcohol consumption	Chemical injury	No relevant studies found	7	NA
Alcohol consumption	Radiation	No relevant studies found	7	NA
Home environment	Impact/blunt force injury	No relevant studies found	7	NA
Home environment	Foreign bodies	No relevant studies found	7	NA
Home environment	Chemical injury	No relevant studies found	7	NA
Home environment	Radiation	No relevant studies found	7	NA

a Groups are as follows:

- Group 1 — Clear association/causality
- Group 2 — Possible association/causality (more research needed)
- Group 3 — Lack of association/causality
- Group 4 — Possible lack of association/causality (more research needed)
- Group 5 — Conflicting results
- Group 6 — Possible protection
- Group 7 — No studies

b Summary sheets number refers to the results tables in Appendix 3.

Table 4.3 Summary of results for refractive error

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
Alcohol consumption	Myopia	No relevant studies found	7	NA
Alcohol consumption	Hyperopia	No relevant studies found	7	NA
Alcohol consumption	Astigmatism	No relevant studies found	7	NA
Alcohol consumption	Presbyopia	No relevant studies found	7	NA
Eye infections	Myopia	No relevant studies found	7	NA
Eye infections	Hyperopia	No relevant studies found	7	NA
Eye infections	Astigmatism	No relevant studies found	7	NA
Eye infections	Presbyopia	No relevant studies found	7	NA
Age/ageing	Myopia	Myopia increases with age up to the age of 30, and again for people over the age of 70.	1	167
Age/ageing	Hyperopia	Hyperopia appears to increase with age up to the age of 70. Some studies report a stabilising and then a further increase with extreme old age, whereas others report a shift to myopia between 70 and 85 years.	2	168
Age/ageing	Astigmatism	It is not clear whether ageing affects the incidence of astigmatism or just the type of astigmatism present.	5	169
Age/ageing	Presbyopia	Link already established		170
UV damage	Myopia	No relevant studies found	7	NA
UV damage	Hyperopia	No relevant studies found	7	NA
UV damage	Astigmatism	No relevant studies found	7	NA
UV damage	Presbyopia	No relevant studies found	7	NA
Diabetes	Myopia	Diabetes does not appear to be a risk factor for myopia.	4	175
Diabetes	Hyperopia	Diabetes can cause transient hyperopia. This effect is corrected when hyperglycaemia is corrected.	2	176
Diabetes	Astigmatism	No relevant studies found	7	NA
Diabetes	Presbyopia	No relevant studies found	7	NA
Heredity	Myopia	High myopia may have a genetic link, but more research is needed.	2	179
Heredity	Hyperopia	No relevant studies found	7	NA
Heredity	Astigmatism	Heredity may be a predisposing factor for astigmatism.	2	181
Heredity	Presbyopia	No relevant studies found	7	NA
Hyperopia	Myopia	No relevant studies found	7	NA
Hyperopia	Astigmatism	No relevant studies found	7	NA
Hyperopia	Presbyopia	Hyperopia may predispose to early development of presbyopia in normal individuals.	2	186
Near-vision work	Myopia	The studies are not sufficient to examine in detail the relationship between the effect of near work and incidence and progression of myopia. Two studies suggest that near work has less effect than heredity; one study suggests that intensive near work could initiate myopia or lead to its progression in young adults. Further longitudinal studies are needed to examine the effect of near work.	2	187
Near-vision work	Hyperopia	No relevant studies found	7	NA
Near-vision work	Astigmatism	No relevant studies found	7	NA
Near-vision work	Presbyopia	No relevant studies found	7	NA
Ocular disease	Myopia	Nuclear opacities (cataract) and glaucoma (and ocular hypertension) may increase the risk of myopia. Further studies are needed to examine the effect of ocular diseases on myopia. Untreated retinopathy of prematurity (ROP) leads	2	191

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
		to a high incidence of myopia in adults.		
Ocular disease	Hyperopia	Hyperopia incidence decreased with incidence of glaucoma and ocular hypertension.	6	192
Ocular disease	Astigmatism	Grave's ophthalmopathy may be associated with greater with-the-rule (horizontal) astigmatism. However, given the low prevalence of Grave's ophthalmopathy, it is unlikely to be a significant risk factor for astigmatism in the general population.	2	193
Ocular disease	Presbyopia	No relevant studies found	7	NA
Trauma	Myopia	No relevant studies found	7	NA
Trauma	Hyperopia	No relevant studies found	7	NA
Trauma	Astigmatism	Although rare, a wound can lead to secondary problems, such as lenticular astigmatism.	2	197
Trauma	Presbyopia	No relevant studies found	7	NA
Antidepressants	Myopia	No relevant studies found	7	NA
Antidepressants	Hyperopia	No relevant studies found	7	NA
Antidepressants	Astigmatism	No relevant studies found	7	NA
Antidepressants	Presbyopia	No relevant studies found	7	NA
Antihistamines	Myopia	No relevant studies found	7	NA
Antihistamines	Hyperopia	No relevant studies found	7	NA
Antihistamines	Astigmatism	No relevant studies found	7	NA
Antihistamines	Presbyopia	No relevant studies found	7	NA
Warm climate	Myopia	No relevant studies found	7	NA
Warm climate	Hyperopia	No relevant studies found	7	NA
Warm climate	Astigmatism	No relevant studies found	7	NA
Warm climate	Presbyopia	No relevant studies found	7	NA
Excessive reading	Myopia	There are conflicting results about the relationship between reading and other near work and development of myopia.	5	211
Excessive reading	Hyperopia	No relevant studies found	7	NA
Excessive reading	Astigmatism	No relevant studies found	7	NA
Excessive reading	Presbyopia	No relevant studies found	7	NA
Computer or TV	Myopia	There appears to be no relationship between computer and television (TV) use and myopia, although further prospective studies would be useful to confirm this result. However, 'near work' such as reading and writing or practical near work is associated with a refractive change towards myopia (see summary table 211). (In one study, sport was protective for myopia development.)	4	215
Computer or TV	Hyperopia	In one study of visual display unit operators, extended use of visual display units caused a slight tendency toward hyperopia, but there is no other research data to support or refute this finding.	2	216
Computer or TV	Astigmatism	No relevant studies found	7	NA
Computer or TV	Presbyopia	No relevant studies found	7	NA
Diet	Myopia	The link between a high glycaemic diet and myopia remains a theory but would be an interesting area for future research.	2	240
Diet	Hyperopia	No relevant studies found	7	NA
Diet	Astigmatism	No relevant studies found	7	NA
Diet	Presbyopia	No relevant studies found	7	NA
Fatty acids	Myopia	No relevant studies found	7	NA
Fatty acids	Hyperopia	No relevant studies found	7	NA

Risk factor	Condition	Finding	Group ^a	Summary sheet number ^b
Fatty acids	Astigmatism	No relevant studies found	7	NA
Fatty acids	Presbyopia	No relevant studies found	7	NA
Obesity	Myopia	No relevant studies found	7	NA
Obesity	Hyperopia	Obesity may be a risk factor for hyperopia, although more research is required in this area.	2	233
Obesity	Astigmatism	No relevant studies found	7	NA
Obesity	Presbyopia	No relevant studies found	7	NA

a Groups are as follows:

- Group 1 — Clear association/causality
- Group 2 — Possible association/causality (more research needed)
- Group 3 — Lack of association/causality
- Group 4 — Possible lack of association/causality (more research needed)
- Group 5 — Conflicting results
- Group 6 — Possible protection
- Group 7 — No studies

b Summary sheets number refers to the results tables in Appendix 3.

Table 4.4 Summary of results for eye infections

Question	Finding	Group ^a	Summary sheet number ^b
Do infection control methods reduce the incidence of eye infections?	In the case of trachoma, there is conflicting evidence as to whether infection control methods, such as insecticide sprays, antibiotics, health education and face washing, reduce the incidence of the disease.	NA	231
What impact does use of contact lenses have on the incidence of eye infections?	Contact lens wear appears to be a significant risk factor for acanthamoebic keratitis.	1	229
Does education on use and misuse of contact lens affect the incidence of eye infections?	One RCT showed that education did not significantly increase compliance with correct contact lens use in lens users; however, no studies looked specifically at incidence of eye infections.	NA	230

a Groups are as follows:

- Group 1 — Clear association/causality
- Group 2 — Possible association/causality (more research needed)
- Group 3 — Lack of association/causality
- Group 4 — Possible lack of association/causality (more research needed)
- Group 5 — Conflicting results
- Group 6 — Possible protection
- Group 7 — No studies

b Summary sheets number refers to the results tables in Appendix 3.

Table 4.5 Summary of results for eye tests

Question	Finding	Group	Summary sheet number ^b
Do regular eye tests reduce the incidence of eye disease?	<p>Community-based screening of asymptomatic older people did not result in improvements in vision.</p> <p>A cohort study in Melbourne found that regular eye examinations in people with normal vision only identified very few people (maximum of 0.88%) with vision loss that could not have been identified by symptoms and/or family history. Further research is needed.</p> <p>There are no RCTs to show the effectiveness or otherwise of population-based screening for glaucoma or for amblyopia in childhood.</p> <p>No studies were found that properly addressed the issue of frequency of eye testing.</p>	<p>Cochrane review (Level 1)</p> <p>Prospective cohort (Level III-2)</p> <p>2 Cochrane reviews (more research needed)</p>	220
Do regular eye tests improve outcomes for diabetic retinopathy?	<p>Regular eye tests appear to be effective for decreasing the incidence of diabetic retinopathy in high-risk patients (although it is not clear how frequent such tests should be), but there appears to be less benefit to frequent screening of low-risk patients or those with negative test results.</p>	<p>Large review from general practitioner-based diabetic population in the United Kingdom (Level 1)</p>	221

a Groups are as follows:

- Group 1 — Clear association/causality
- Group 2 — Possible association/causality (more research needed)
- Group 3 — Lack of association/causality
- Group 4 — Possible lack of association/causality (more research needed)
- Group 5 — Conflicting results
- Group 6 — Possible protection
- Group 7 — No studies

b Summary sheets number refers to the results tables in Appendix 3.

