**Appendix**

**The explanation for Read codes**

NHS website: <https://digital.nhs.uk/services/terminology-and-classifications/read-codes>

“Read Codes are a coded thesaurus of clinical terms. They have been used in the NHS since 1985. There are two versions: version 2 (v2) and version 3 (CTV3 or v3). Both versions provide a standard vocabulary for clinicians to record patient findings and procedures, in health and social care IT systems across primary and secondary care.”

**Appendix 1: Read codes of Type 1 diabetes used in data extraction**

|  |  |
| --- | --- |
| Read code | Description |
| C100011 | Insulin dependent diabetes mellitus |
| C10E.00 | Type 1 diabetes mellitus |
| C108.00 | Insulin dependent diabetes mellitus |
| C108700 | Insulin dependent diabetes mellitus with retinopathy |
| C108800 | Insulin dependent diabetes mellitus - poor control |
| C10ED00 | Type 1 diabetes mellitus with nephropathy |
| C10EM00 | Type 1 diabetes mellitus with ketoacidosis |
| C10E.11 | Type I diabetes mellitus |
| C108F11 | Type I diabetes mellitus with diabetic cataract |
| C108.12 | Type 1 diabetes mellitus |
| C108J12 | Type 1 diabetes mellitus with neuropathic arthropathy |
| C10E700 | Type 1 diabetes mellitus with retinopathy |
| C108.11 | IDDM-Insulin dependent diabetes mellitus |
| C10EH00 | Type 1 diabetes mellitus with arthropathy |
| C10E500 | Type 1 diabetes mellitus with ulcer |
| C108012 | Type 1 diabetes mellitus with renal complications |
| C10EP00 | Type 1 diabetes mellitus with exudative maculopathy |
| C108.13 | Type I diabetes mellitus |
| C108B00 | Insulin dependent diabetes mellitus with mononeuropathy |
| C108400 | Unstable insulin dependent diabetes mellitus |
| C10EL00 | Type 1 diabetes mellitus with persistent microalbuminuria |
| C10EK00 | Type 1 diabetes mellitus with persistent proteinuria |
| C108900 | Insulin dependent diabetes maturity onset |
| C10E800 | Type 1 diabetes mellitus - poor control |
| C108711 | Type I diabetes mellitus with retinopathy |
| C10EE00 | Type 1 diabetes mellitus with hypoglycaemic coma |
| C108J00 | Insulin dependent diab mell with neuropathic arthropathy |
| C10E900 | Type 1 diabetes mellitus maturity onset |
| C10EN00 | Type 1 diabetes mellitus with ketoacidotic coma |
| C108712 | Type 1 diabetes mellitus with retinopathy |
| C108C00 | Insulin dependent diabetes mellitus with polyneuropathy |
| C108E11 | Type I diabetes mellitus with hypoglycaemic coma |
| C10E200 | Type 1 diabetes mellitus with neurological complications |
| C10E400 | Unstable type 1 diabetes mellitus |
| C108F00 | Insulin dependent diabetes mellitus with diabetic cataract |
| C108E00 | Insulin dependent diabetes mellitus with hypoglycaemic coma |
| C108500 | Insulin dependent diabetes mellitus with ulcer |
| C10E312 | Insulin dependent diabetes mellitus with multiple complicat |
| C108812 | Type 1 diabetes mellitus - poor control |
| C10EC00 | Type 1 diabetes mellitus with polyneuropathy |
| C108811 | Type I diabetes mellitus - poor control |
| C10E000 | Type 1 diabetes mellitus with renal complications |
| C10E100 | Type 1 diabetes mellitus with ophthalmic complications |
| C10E300 | Type 1 diabetes mellitus with multiple complications |
| C108211 | Type I diabetes mellitus with neurological complications |
| C10EF00 | Type 1 diabetes mellitus with diabetic cataract |
| C10E411 | Unstable type I diabetes mellitus |
| C10E.12 | Insulin dependent diabetes mellitus |
| C108511 | Type I diabetes mellitus with ulcer |
| C108300 | Insulin dependent diabetes mellitus with multiple complicatn |
| C10EJ00 | Type 1 diabetes mellitus with neuropathic arthropathy |
| C10E412 | Unstable insulin dependent diabetes mellitus |
| C10EQ00 | Type 1 diabetes mellitus with gastroparesis |
| C108D00 | Insulin dependent diabetes mellitus with nephropathy |
| C108411 | Unstable type I diabetes mellitus |
| C108J11 | Type I diabetes mellitus with neuropathic arthropathy |
| C108600 | Insulin dependent diabetes mellitus with gangrene |
| C108011 | Type I diabetes mellitus with renal complications |
| C108212 | Type 1 diabetes mellitus with neurological complications |
| C10EM11 | Type I diabetes mellitus with ketoacidosis |
| C108H11 | Type I diabetes mellitus with arthropathy |
| C10EA11 | Type I diabetes mellitus without complication |
| C108911 | Type I diabetes mellitus maturity onset |
| C108G00 | Insulin dependent diab mell with peripheral angiopathy |
| C108H00 | Insulin dependent diabetes mellitus with arthropathy |
| C10EN11 | Type I diabetes mellitus with ketoacidotic coma |
| C108D11 | Type I diabetes mellitus with nephropathy |
| C10EB00 | Type 1 diabetes mellitus with mononeuropathy |
| C108512 | Type 1 diabetes mellitus with ulcer |
| ZC2C900 | Dietary advice for type I diabetes |
| C10EA00 | Type 1 diabetes mellitus without complication |
| C10E600 | Type 1 diabetes mellitus with gangrene |
| C108E12 | Type 1 diabetes mellitus with hypoglycaemic coma |
| C10E812 | Insulin dependent diabetes mellitus - poor control |
| C10E311 | Type I diabetes mellitus with multiple complications |
| C10EC11 | Type I diabetes mellitus with polyneuropathy |
| C10EG00 | Type 1 diabetes mellitus with peripheral angiopathy |
| C10E712 | Insulin dependent diabetes mellitus with retinopathy |
| C10E511 | Type I diabetes mellitus with ulcer |
| C10E711 | Type I diabetes mellitus with retinopathy |
| C108A11 | Type I diabetes mellitus without complication |
| C10E911 | Type I diabetes mellitus maturity onset |
| C108912 | Type 1 diabetes mellitus maturity onset |
| C108412 | Unstable type 1 diabetes mellitus |
| C10E912 | Insulin dependent diabetes maturity onset |
| C10EP11 | Type I diabetes mellitus with exudative maculopathy |
| C10E512 | Insulin dependent diabetes mellitus with ulcer |
| C108B11 | Type I diabetes mellitus with mononeuropathy |
| C10E111 | Type I diabetes mellitus with ophthalmic complications |
| C10EE12 | Insulin dependent diabetes mellitus with hypoglycaemic coma |
| C10EF12 | Insulin dependent diabetes mellitus with diabetic cataract |
| C10EC12 | Insulin dependent diabetes mellitus with polyneuropathy |
| C10E611 | Type I diabetes mellitus with gangrene |
| C10ED12 | Insulin dependent diabetes mellitus with nephropathy |
| C10EL11 | Type I diabetes mellitus with persistent microalbuminuria |
| C108112 | Type 1 diabetes mellitus with ophthalmic complications |
| 66At011 | Type 1 diabetic dietary review |
| C10E811 | Type I diabetes mellitus - poor control |
| C108311 | Type I diabetes mellitus with multiple complications |
| C10P000 | Type I diabetes mellitus in remission |
| C10EQ11 | Type I diabetes mellitus with gastroparesis |
| C10E612 | Insulin dependent diabetes mellitus with gangrene |
| C10P011 | Type 1 diabetes mellitus in remission |
| C10E011 | Type I diabetes mellitus with renal complications |
| C108F12 | Type 1 diabetes mellitus with diabetic cataract |
| C108A12 | Type 1 diabetes mellitus without complication |
| C108D12 | Type 1 diabetes mellitus with nephropathy |
| C10ED11 | Type I diabetes mellitus with nephropathy |
| C108C11 | Type I diabetes mellitus with polyneuropathy |
| C108612 | Type 1 diabetes mellitus with gangrene |
| C100011 | Insulin dependent diabetes mellitus |

**Appendix 2:** **Read codes of Type 2 diabetes used in data extraction**

|  |  |
| --- | --- |
| **Read code** | **Description** |
| C100112 | Non-insulin dependent diabetes mellitus |
| C10F.00 | Type 2 diabetes mellitus |
| C10FJ00 | Insulin treated Type 2 diabetes mellitus |
| 66A4.00 | Diabetic on oral treatment |
| C109.00 | Non-insulin dependent diabetes mellitus |
| C109.11 | NIDDM - Non-insulin dependent diabetes mellitus |
| 66A3.00 | Diabetic on diet only |
| C109700 | Non-insulin dependent diabetes mellitus - poor control |
| C10FC00 | Type 2 diabetes mellitus with nephropathy |
| C10F500 | Type 2 diabetes mellitus with gangrene |
| C109600 | Non-insulin-dependent diabetes mellitus with retinopathy |
| C109.12 | Type 2 diabetes mellitus |
| C109G11 | Type II diabetes mellitus with arthropathy |
| C109012 | Type 2 diabetes mellitus with renal complications |
| C109.13 | Type II diabetes mellitus |
| C109J12 | Insulin treated Type II diabetes mellitus |
| C109J00 | Insulin treated Type 2 diabetes mellitus |
| C10FM00 | Type 2 diabetes mellitus with persistent microalbuminuria |
| C10FB00 | Type 2 diabetes mellitus with polyneuropathy |
| C10F600 | Type 2 diabetes mellitus with retinopathy |
| C10F000 | Type 2 diabetes mellitus with renal complications |
| C10F.11 | Type II diabetes mellitus |
| C109711 | Type II diabetes mellitus - poor control |
| C109G00 | Non-insulin dependent diabetes mellitus with arthropathy |
| C109C12 | Type 2 diabetes mellitus with nephropathy |
| ZC2CA00 | Dietary advice for type II diabetes |
| C10FQ00 | Type 2 diabetes mellitus with exudative maculopathy |
| C10F700 | Type 2 diabetes mellitus - poor control |
| C10FL00 | Type 2 diabetes mellitus with persistent proteinuria |
| C109900 | Non-insulin-dependent diabetes mellitus without complication |
| C10FN00 | Type 2 diabetes mellitus with ketoacidosis |
| C10F200 | Type 2 diabetes mellitus with neurological complications |
| C10FK00 | Hyperosmolar non-ketotic state in type 2 diabetes mellitus |
| C109400 | Non-insulin dependent diabetes mellitus with ulcer |
| C10FH00 | Type 2 diabetes mellitus with neuropathic arthropathy |
| C109K00 | Hyperosmolar non-ketotic state in type 2 diabetes mellitus |
| C109J11 | Insulin treated non-insulin dependent diabetes mellitus |
| C10FF00 | Type 2 diabetes mellitus with peripheral angiopathy |
| C109500 | Non-insulin dependent diabetes mellitus with gangrene |
| C109H00 | Non-insulin dependent d m with neuropathic arthropathy |
| C109612 | Type 2 diabetes mellitus with retinopathy |
| C10F311 | Type II diabetes mellitus with multiple complications |
| C109D00 | Non-insulin dependent diabetes mellitus with hypoglyca coma |
| C109E12 | Type 2 diabetes mellitus with diabetic cataract |
| C10FE00 | Type 2 diabetes mellitus with diabetic cataract |
| C109B00 | Non-insulin dependent diabetes mellitus with polyneuropathy |
| C109712 | Type 2 diabetes mellitus - poor control |
| C109212 | Type 2 diabetes mellitus with neurological complications |
| C109512 | Type 2 diabetes mellitus with gangrene |
| C10FD00 | Type 2 diabetes mellitus with hypoglycaemic coma |
| C10F711 | Type II diabetes mellitus - poor control |
| C10F100 | Type 2 diabetes mellitus with ophthalmic complications |
| C109B11 | Type II diabetes mellitus with polyneuropathy |
| C109H11 | Type II diabetes mellitus with neuropathic arthropathy |
| C10F900 | Type 2 diabetes mellitus without complication |
| C109E11 | Type II diabetes mellitus with diabetic cataract |
| C10F400 | Type 2 diabetes mellitus with ulcer |
| C10F611 | Type II diabetes mellitus with retinopathy |
| C109G12 | Type 2 diabetes mellitus with arthropathy |
| C109011 | Type II diabetes mellitus with renal complications |
| C109100 | Non-insulin-dependent diabetes mellitus with ophthalm comps |
| C10FB11 | Type II diabetes mellitus with polyneuropathy |
| L180600 | Pre-existing diabetes mellitus, non-insulin-dependent |
| C109A11 | Type II diabetes mellitus with mononeuropathy |
| C10FP00 | Type 2 diabetes mellitus with ketoacidotic coma |
| C109000 | Non-insulin-dependent diabetes mellitus with renal comps |
| C10F911 | Type II diabetes mellitus without complication |
| C109F00 | Non-insulin-dependent d m with peripheral angiopath |
| C109F11 | Type II diabetes mellitus with peripheral angiopathy |
| C109411 | Type II diabetes mellitus with ulcer |
| C109200 | Non-insulin-dependent diabetes mellitus with neuro comps |
| C109D11 | Type II diabetes mellitus with hypoglycaemic coma |
| C107400 | NIDDM with peripheral circulatory disorder |
| C10F011 | Type II diabetes mellitus with renal complications |
| C109611 | Type II diabetes mellitus with retinopathy |
| C10FG00 | Type 2 diabetes mellitus with arthropathy |
| C109C00 | Non-insulin dependent diabetes mellitus with nephropathy |
| C109111 | Type II diabetes mellitus with ophthalmic complications |
| C109F12 | Type 2 diabetes mellitus with peripheral angiopathy |
| C10FL11 | Type II diabetes mellitus with persistent proteinuria |
| C109D12 | Type 2 diabetes mellitus with hypoglycaemic coma |
| C109511 | Type II diabetes mellitus with gangrene |
| C109300 | Non-insulin-dependent diabetes mellitus with multiple comps |
| C10FA00 | Type 2 diabetes mellitus with mononeuropathy |
| C10FR00 | Type 2 diabetes mellitus with gastroparesis |
| C109C11 | Type II diabetes mellitus with nephropathy |
| C10FJ11 | Insulin treated Type II diabetes mellitus |
| C10F300 | Type 2 diabetes mellitus with multiple complications |
| C109412 | Type 2 diabetes mellitus with ulcer |
| C109H12 | Type 2 diabetes mellitus with neuropathic arthropathy |
| C109211 | Type II diabetes mellitus with neurological complications |
| C109E00 | Non-insulin depend diabetes mellitus with diabetic cataract |
| C109112 | Type 2 diabetes mellitus with ophthalmic complications |
| C109A00 | Non-insulin dependent diabetes mellitus with mononeuropathy |
| C10FM11 | Type II diabetes mellitus with persistent microalbuminuria |
| C10F411 | Type II diabetes mellitus with ulcer |
| C10FE11 | Type II diabetes mellitus with diabetic cataract |
| C10FA11 | Type II diabetes mellitus with mononeuropathy |
| C10F211 | Type II diabetes mellitus with neurological complications |
| C10FD11 | Type II diabetes mellitus with hypoglycaemic coma |
| C10F111 | Type II diabetes mellitus with ophthalmic complications |
| C10FC11 | Type II diabetes mellitus with nephropathy |
| C10FG11 | Type II diabetes mellitus with arthropathy |
| C10F511 | Type II diabetes mellitus with gangrene |
| C10FF11 | Type II diabetes mellitus with peripheral angiopathy |
| C109912 | Type 2 diabetes mellitus without complication |
| C10FP11 | Type II diabetes mellitus with ketoacidotic coma |
| C10FN11 | Type II diabetes mellitus with ketoacidosis |
| C10FK11 | Hyperosmolar non-ketotic state in type II diabetes mellitus |
| C10P100 | Type II diabetes mellitus in remission |
| C109312 | Type 2 diabetes mellitus with multiple complications |
| C109911 | Type II diabetes mellitus without complication |
| C10FH11 | Type II diabetes mellitus with neuropathic arthropathy |
| 66AH300 | Conversion to non-insulin injectable medication |
| C109B12 | Type 2 diabetes mellitus with polyneuropathy |
| 66o2.00 | Diabetic on non-insulin injectable medication |
| 66o5.00 | Diabetic on oral treatment and glucagon-like peptide 1 |
| C10P111 | Type 2 diabetes mellitus in remission |
| C10FQ11 | Type II diabetes mellitus with exudative maculopathy |
| C109311 | Type II diabetes mellitus with multiple complications |
| C10FR11 | Type II diabetes mellitus with gastroparesis |

**Appendix 3: Read codes of STDR used in data extraction**

|  |  |
| --- | --- |
| **Read code** | **Description** |
| 8D36.00 | Removable artificial eye |
| 6689 | Registered blind |
| F4K2800 | Vitreous haemorrhage |
| 7270100 | Extirpation of vitreous body NEC |
| F42y900 | Macular oedema |
| F490.00 | Blindness, both eyes |
| 7272013 | Laser therapy lesion of retina |
| 6688 | Registered partially sighted |
| F420200 | Preproliferative diabetic retinopathy |
| 1B75.00 | Loss of vision |
| 7272012 | Photocoagulation of lesion of retina NEC |
| F420100 | Proliferative diabetic retinopathy |
| 2BB8.00 | O/E - vitreous haemorrhages |
| F420400 | Diabetic maculopathy |
| 22EF.00 | O/E - has one eye |
| F495000 | Blindness, one eye, unspecified |
| 2B7A.11 | O/E - blind L-eye |
| F49..13 | Partial sight |
| F49..11 | Impaired vision |
| 7270 | Operations on vitreous body |
| 6688.11 | Registered partially blind |
| F492.00 | Low vision, both eyes |
| F422.00 | Other proliferative retinopathy |
| 1B77.00 | Deteriorating vision |
| F49..00 | Blindness and low vision |
| 7272300 | Laser destruction of lesion of retina |
| F49..14 | Sight impaired |
| 2BBL.00 | O/E - diabetic maculopathy present both eyes |
| F420300 | Advanced diabetic maculopathy |
| Z6F..11 | Laser therapy |
| 2B6A.11 | O/E - blind R-eye |
| F404100 | Blind hypotensive eye |
| Z9E1100 | Provision of artificial eye |
| 7276 | Pan retinal photocoagulation for diabetes |
| 7270400 | Pars plana vitrectomy |
| 5B4..11 | Retinal laser therapy |
| F49..12 | Low vision |
| 2BBT.00 | O/E - right eye proliferative diabetic retinopathy |
| 2BBR.00 | O/E - right eye preproliferative diabetic retinopathy |
| 2BBV.00 | O/E - left eye proliferative diabetic retinopathy |
| 2BBW.00 | O/E - right eye diabetic maculopathy |
| 2BBS.00 | O/E - left eye preproliferative diabetic retinopathy |
| 2BBn.00 | O/E - left eye clinically significant macular oedema |
| 2BBX.00 | O/E - left eye diabetic maculopathy |
| 668C.00 | Certificate of vision impairment |
| F495.00 | Profound impairment, one eye |
| ZV43000 | [V]Has artificial eye globe |
| 2BBO.00 | O/E - Laser photocoagulation scars |
| 2BBY.00 | O/E - referable retinopathy |
| F493.00 | Visual loss, both eyes unqualified |
| F496000 | Low vision, one eye, unspecified |
| 22E6.12 | O/E - glass eye |
| C10EP00 | Type 1 diabetes mellitus with exudative maculopathy |
| 2B78.00 | O/E - visual acuity L-eye=6/60 |
| F49z.11 | Acquired blindness |
| Z9E2.00 | Optical low vision aid provision |
| F496200 | Lesser eye: severe VI, Better eye: near normal vision |
| F49y.00 | Visual loss, one eye, unqualified |
| C10FQ00 | Type 2 diabetes mellitus with exudative maculopathy |
| F496.00 | Low vision, one eye |
| 2BBm.00 | O/E - right eye clinically significant macular oedema |
| 2B6A.00 | O/E-R-eye perceives light only |
| 5B42.00 | Laser therapy - retinal lesion |
| 22E6.11 | O/E - false eye |
| F491000 | One eye blind, one eye low vision |
| FyuH400 | [X]Vitreous haemorrhage in diseases classified elsewhere |
| F420700 | High risk proliferative diabetic retinopathy |
| 7270300 | Injection into vitreous body NEC |
| 7270z00 | Operation on vitreous body NOS |
| 7270500 | Air/gas exchange of vitreous |
| 22E6.13 | O/E - prosthetic eye |
| F4H7300 | Cortical blindness |
| Z9E1200 | Provision of removable artificial eye |
| Z96..00 | Provision for visual and hearing impairment |
| 2B68.00 | O/E - visual acuity R-eye=6/60 |
| 2B6B.00 | O/E - R-eye completely blind |
| 2B69.00 | O/E -R-eye counts fingers only |
| 2B7B.00 | O/E - L-eye completely blind |
| 2B7C.00 | O/E - L-eye sees hand movements |
| F492z00 | Low vision, both eyes NOS |
| 2B79.00 | O/E -L-eye counts fingers only |
| 2BB7.00 | O/E - retinal vascular prolif. |
| F422y00 | Other specified other proliferative retinopathy |
| F404200 | Blind hypertensive eye |
| Z9E3100 | Provision of magnifier low vision aid - near |
| F496z00 | Low vision, one eye NOS |
| F495A00 | Acquired blindness, one eye |
| F422z00 | Proliferative retinopathy NOS |
| 2B6W.00 | O/E - R-eye visual acuity (corrected) 4/60 |
| 2B7A.00 | O/E-L-eye perceives light only |
| 2B7W.00 | O/E - L-eye visual acuity (corrected) 4/60 |
| 7270200 | Injection of vitreous substitute into vitreous body |
| 7270y00 | Other specified operation on vitreous body |
| Z961.00 | Provision of guide help for visual and hearing impairment |
| 7273000 | Epiretinal dissection |
| 2B7E.00 | O/E - visual acuity L-eye=3/60 |
| Z9E4.00 | Provision of optical low vision aid - distance |
| F492000 | Low vision, both eyes unspecified |
| ZV52200 | [V]Fitting or adjustment of artificial eye |
| 2B6L.00 | O/E - pinhole visual acuity R-eye=6/60 |
| 2B6R.00 | O/E - pinhole R-eye perceives light only |
| 2B7L.00 | O/E - pinhole visual acuity L-eye=6/60 |
| F490900 | Acquired blindness, both eyes |
| ZV43100 | [V]Has artificial eye lens |
| F495z00 | Profound impairment one eye NOS |
| 2B6C.00 | O/E - R-eye sees hand movements |
| 2B6T.00 | O/E - R-eye visual acuity (corrected) 1/60 |
| 7272500 | Panretinal laser photocoagulation to lesion of retina NEC |
| 2B6Q.00 | O/E - pinhole R-eye counts fingers only |
| 2BBk.00 | O/E - right eye stable treated prolif diabetic retinopathy |
| F420500 | Advanced diabetic retinal disease |
| 2B6E.00 | O/E - visual acuity R-eye=3/60 |
| 2B6V.00 | O/E - R-eye visual acuity (corrected) 2/60 |
| 2B7T.00 | O/E - L-eye visual acuity (corrected) 1/60 |
| F490z00 | Blindness both eyes NOS |
| 2B6P.00 | O/E - pinhole R-eye sees hand movements |
| 2B7Q.00 | O/E - pinhole L-eye counts fingers only |
| 22E6.00 | O/E - glass (prosthetic) eye |
| F491300 | Better eye: severe VI, Lesser eye: near total VI |
| 2B7P.00 | O/E - pinhole L-eye sees hand movements |
| 2B6S.00 | O/E - pinhole R-eye completely blind |
| 2BBl.00 | O/E - left eye stable treated prolif diabetic retinopathy |
| 2BBo.00 | O/E - sight threatening diabetic retinopathy |
| Z9E5400 | Provision of ancillary low vision aid |
| 2B7S.00 | O/E - pinhole L-eye completely blind |
| 2B7R.00 | O/E - pinhole L-eye perceives light only |
| F491z00 | One eye blind, one eye low vision NOS |
| F490000 | Unspecified blindness both eyes |
| F490100 | Both eyes total visual impairment |
| F491.00 | Better eye: low vision, Lesser eye: profound VI |
| 8F6..11 | Blind rehabilitation |
| 7272600 | Laser photocoagulation to lesion of retina NEC |
| 2B7V.00 | O/E - L-eye visual acuity (corrected) 2/60 |
| F495400 | Lesser eye: near total VI, Better eye: unspecified |
| F494.00 | Legal blindness USA |
| Z9E3.00 | Provision of optical low vision aid - near |
| Z9E3B00 | Near low vision aid - integral spectacle telescope |
| Z9E5.00 | Provision of non-optical low vision aid |
| F496500 | Lesser eye: moderate VI, Better eye: near normal vision |
| F495100 | Lesser eye: total visual impairment, Better eye: unspecified |
| Z9E3500 | Provision of spectacle low vision aid - near |
| F495500 | Lesser eye: near total VI, Better eye: near normal vision |
| F495600 | Lesser eye: near total VI, Better eye: normal vision |
| 7270A00 | Removal of internal tamponade agent from vitreous body |
| F420800 | High risk non proliferative diabetic retinopathy |
| 2B7X.00 | O/E - L-eye visual acuity (corrected) 5/60 |
| 2B6X.00 | O/E - R-eye visual acuity (corrected) 5/60 |
| F492200 | Better eye: severe VI, Lesser eye: severe VI |
| 8F61.00 | Blind rehabilitation |
| 7270600 | Internal tamponade of retina using gas |
| Z9E3300 | Provision of low vision stand magnifier |
| F491400 | Better eye: severe VI, Lesser eye: profound VI |
| F496300 | Lesser eye: severe VI, Better eye: normal vision |
| F496600 | Lesser eye: moderate VI, Better eye: normal vision |
| F492400 | Better eye: moderate VI, Lesser eye: severe VI |
| F491500 | Better eye: moderate VI, Lesser eye: blind, unspecified |
| Z9E3200 | Provision of low vision hand magnifier |
| F495800 | Lesser eye: profound VI, Better eye: near normal vision |
| F492500 | Better eye: moderate VI, Lesser eye: moderate VI |
| F491700 | Better eye: moderate VI, Lesser eye: near total VI |
| 727C200 | Injection therapeutic substance posterior segment of eye NEC |
| 7274800 | Injection of therapeutic substance around the eye |
| F492300 | Better eye: moderate VI, Lesser eye: low vision unspecified |
| ZN56800 | Blind telephone user |
| 7L19E00 | Injection of triamcinolone |
| 727C100 | Injection of steroid into posterior segment of eye |
| 7272800 | Panretinal laser photocoagulation to lesion of retina |
| 727Cy00 | Other specified operations on posterior segment of eye |
| 7270411 | Vitrectomy using pars plana approach |
| 7270900 | Internal tamponade of retina using oil |
| 7270C00 | Injection of vitreous substitute into vitreous body NEC |
| 8F62.00 | Blind lead dog rehabilitation |
| Z9E3900 | Near low vision aid - clip-on spectacle magnifier |
| 7270800 | Internal tamponade of retina using liquid |
| F490400 | Better eye: near total VI, Lesser eye: near total VI |
| FyuF700 | [X]Other proliferative retinopathy |
| C10EP11 | Type I diabetes mellitus with exudative maculopathy |
| Z9E3C00 | Near low vision aid - clip-on spectacle telescope |
| 9NlD.00 | Seen by visual impairment teacher |
| FyuL.00 | [X]Visual disturbances and blindness |
| F490200 | Better eye: near total VI, Lesser eye: unspecified |
| 8HlE.00 | Referral to visual impairment multidisciplinary team |
| F495200 | Lesser eye: total VI, Better eye: near normal vision |
| F495300 | Lesser eye: total VI, Better eye: normal vision |
| F490600 | Better eye: profound VI, Lesser eye: total VI |
| F491100 | Better eye: severe VI, Lesser eye: blind, unspecified |
| ZK74.00 | Issue of local authority blind registration |
| 7270D00 | Injection of Ranibizumab into vitreous body |
| 7277600 | Injection of therapeutic substance into macula |
| F496400 | Lesser eye: moderate VI, Better eye: unspecified |
| 7272900 | Focal laser photocoagulation of retina |
| 668D.00 | Registered sight impaired |
| 6689.11 | Registered severely sight impaired |
| 2BBr.00 | Impaired vision due to diabetic retinopathy |
| Z9E3D00 | Near low vision aid - extra cap for telescope |
| Fy1..00 | Combined visual and hearing impairment |
| 727C000 | Insertion sustained release device posterior segment of eye |
| F49A.00 | Blindness, monocular |
| F496100 | Lesser eye: severe VI, Better eye: unspecified |
| 727Cz00 | Operations on posterior segment of eye NOS |
| F425900 | Maculopathy |
| F497.00 | Severe visual impairment, binocular |
| F49B.00 | Severe visual impairment, monocular |
| F49C.00 | Moderate visual impairment, monocular |
| F498.00 | Moderate visual impairment, binocular |
| 9NfB.00 | Requires deafblind communicator guide |
| 9m08.00 | Excluded from diabetic retinopathy screening as blind |
| 1a00000 | Uses guide dog for the blind |
| Z962.00 | Provision of communicator for visual and hearing impairment |
| F49D.00 | Visual impairment |
| Fy1..12 | Deafblind |
| 9Nfb.00 | Requires deafblind block alphabet interpreter |
| ZN56A00 | Deaf-blind telephone user |
| C10FQ11 | Type II diabetes mellitus with exudative maculopathy |
| 9Nfa.00 | Requires deafblind manual alphabet interpreter |
| Z9E3800 | Near low vision aid - integral spectacle magnifier |
| Fy1..11 | Dual sensory impairment - deafblind |
| F490500 | Better eye: profound VI, Lesser eye: unspecified |
| F492100 | Better eye: severe VI, Lesser eye: low vision unspecified |

**Appendix Table 1: Baseline characteristics of participants with diabetes**

|  |  |  |
| --- | --- | --- |
| **Type 1 diabetes** | **With Townsend index (*n =* *3,601*)** | **Without Townsend index (*n = 805*)** |
| **Age (years), meanSD** | 17.1 | 16.89.5 |
| **Male sex, *n (%)*** | 2,116 (58.8) | 444 (55.2) |
| **Ethnicity, *n (%)*** |  |  |
| White | 1,619 (45.0) | 380 (47.2) |
| Mixed or Multiples | 13 (0.4) | 2 (0.2) |
| Other ethnic groups | 15 (0.4) | 8 (1.0) |
| Black, Black British, Black Welsh, Caribbean or African | 22 (0.6) | 8 (1.0) |
| Asian, Asian British, Asian Welsh | 37 (1.0) | 20 (2.5) |
| Missing | 1,895 (52.6) | 387 (48.1) |
| **Smoking Status, *n (%)*** |  |  |
| Smoker | 1,644 (45.7) | 376 (46.7) |
| Ex-smoker | 417 (11.6) | 89 (11.1) |
| Non-smoker | 210 (5.8) | 35 (4.3) |
| Missing | 1,330 (36.9) | 305 (37.9) |
| **HbA1c categories, *n (%)\**** |  |  |
| <6.5% | 505 (14.0) | 104 (12.9) |
| 6.5-7.5% | 776 (21.5) | 165 (20.5) |
| 7.5-8.5% | 720 (20.0) | 162 (20.1) |
| 8.5% | 962 (26.7) | 210 (26.1) |
| Missing | 638 (17.7) | 164 (20.4) |
| **Hypertension, *n (%)*** | 32 (0.9) | 9 (1.1) |
| **Chronic kidney disease, *n (%)*** | 43 (1.2) | 4 (0.5) |
| **Diabetic Foot Disease, *n (%)*** | 49 (1.4) | 11 (1.4) |
| **Metformin, *n (%)*** | 153 (4.2) | 48 (6.0) |
| **Lipid-lowering drugs, *n (%)*** | 89 (2.5) | 17 (2.1) |
|  |  |  |
| **Type 2 diabetes** | **With Townsend index (*n = 142,991*)** | **Without Townsend index (*n = 28,231*)** |
| **Age (years), meanSD** | 62.913.1 | 61.613.3 |
| **Male sex, *n (%)*** | 18,314 (59.3) | 17,044 (57.3) |
| **Ethnicity, *n (%)*** |  |  |
| White | 65,404 (45.7) | 13,025 (46.1) |
| Mixed or Multiples | 875 (0.6) | 362 (1.3) |
| Other ethnic groups | 318 (0.2) | 110 (0.4) |
| Black, Black British, Black Welsh, Caribbean or African | 1,841 (1.3) | 641 (2.3) |
| Asian, Asian British, Asian Welsh | 4,363 (3.1) | 1,411 (5.0) |
| Missing | 70,190 (49.1) | 12,682 (44.9) |
| **Smoking Status, *n (%)*** |  |  |
| Smoker | 191 (0.1) | 18 (0.1) |
| Ex-smoker | 23,302 (16.3) | 4,876 (17.3) |
| Non-smoker | 52,229 (36.5) | 9,679 (34.3) |
| Missing | 67,269 (47.0) | 13,658 (48.4) |
| **BMI (kg/m2), meanSD** | 31.6 | 31.9 |
| **BMI categories** |  |  |
| Underweight/Normal Weight (<25) | 17,974 (12.6) | 3,506 (12.4) |
| Overweight (25-30) | 45,323 (31.7) | 8,689 (30.8) |
| Class 1 Obesity (30-35) | 41,049 (28.7) | 8,023 (28.4) |
| Class 2 Obesity (35-40) | 21,382 (15.0) | 4,331 (15.3) |
| Class 3 Obesity (≥40) | 14,837 (10.4) | 3,217 (11.4) |
| Missing | 2426 (1.7) | 465 (1.6) |
| **HbA1c categories, *n (%)\**** |  |  |
| 6.5% | 59,056 (41.3) | 11,322 (40.1) |
| 6.5-7.5% | 55,428 (38.8) | 10,852 (38.4) |
| 7.5-8.5% | 13,988 (9.8) | 2,896 (10.3) |
| 8.5% | 11,473 (8.0) | 2,490 (8.8) |
| Missing | 3,046 (2.1) | 671 (2.4) |
| **Hypertension, *n (%)*** | 77,971 (54.5) | 14,927 (52.9) |
| **Peripheral vascular disease, *n (%)*** | 4,462 (3.1) | 690 (2.4) |
| **Stroke, *n (%)*** | 10,399 (7.3) | 1,826 (6.5) |
| **Ischemic heart disease, *n (%)*** | 24,619 (17.2) | 4,332 (15.3) |
| **Heart Failure, *n (%)*** | 5,129 (3.6) | 964 (3.4) |
| **Chronic kidney diseases, *n (%)*** | 24,429 (17.1) | 4,307 (15.3) |
| **Diabetic Foot Disease, *n (%)*** | 21,329 (14.9) | 3,459 (12.3) |
| **Insulin, *n (%)*** | 9,771 (6.8) | 1,975 (7.0) |
| **Metformin, *n (%)*** | 76,978 (53.8) | 16,050 (56.9) |
| **All other glucose-lowering drugs, *n (%)*** | 23,710 (16.6) | 4,521 (16.0) |
| **Lipid-lowering drugs, *n (%)*** | 104,603 (73.2) | 19,401 (68.7) |
| HbA1c, hemoglobin A1c. | | |

**Appendix Table 2: The incidence rate and hazard ratio of STDR in sensitivity analysis**

|  |  |  |
| --- | --- | --- |
| **Type 1 diabetes** | **With Townsend index** | **Without Townsend index** |
| **N** | 3,601 | 805 |
| **STDR,** n (%) | 73 | 16 |
| **Person-years** | 15,895.9 | 3,373 |
| **Incidence rate (per 1,000 person-years)** | 4.6 | 4.7 |
| **Crude hazard ratio (95% CI)** | Ref | 1.00 (0.58, 1.73) |
| **Adjusted hazard ratio (95% CI) \*†** | Ref | 0.67 (0.32, 1.38) |
|  |  |  |
| **Type 2 diabetes** | **With Townsend index** | **Without Townsend index** |
| **N** | 142,991 | 28,231 |
| **STDR,** n (%) | 4,312 | 1,051 |
| **Person-years** | 626,666.1 | 128,179.6 |
| **Incidence rate (per 1,000 person-years)** | 6.9 | 8.2 |
| **Crude hazard ratio (95% CI)** | Ref | 1.02 (0.95, 1.10) |
| **Adjusted hazard ratio (95% CI) \***‡ | Ref | 1.04 (0.97, 1.12) |
| STDR, sight-threatening diabetic retinopathy.  \* Missing data on ethnicity, smoking status, weight, height, BMI and HbA1c were imputed using multiple imputation using chained equations approach.  †Adjusted for age at index, sex, ethnicity, weight and height, HbA1c, smoking, hypertension, chronic kidney disease (stage 3 to 5), diabetic foot disease, glucose-lowering medicine, and lipid-lowering medicine.  ‡Adjusted for age at index, sex, ethnicity, BMI, HbA1c, smoking, hypertension, peripheral vascular disease, ischemic heart disease stroke, heart failure, chronic kidney disease (stage 3 to 5), diabetic foot disease, glucose-lowering medicine, and lipid-lowering medicine. | | |