

Appendix 1: 7 Step Process of Read codes selection methods

Read codes cover clinical features, diagnosis, procedures, some drugs and investigations (1). Ones used in IMRD consist of 7 characters. They have a hierarchy with more specific ones down the order. This was done in collaboration with Jhot Chandan, a fellow doctoral researcher and my supervisor Krishnarajah Nirantharakumar (Institute of Applied Health Research)

1. The Read code database (MsAccess, MsExcel) is divided into two main columns: A Medcode column with unique 8 character codes for each condition and a description column. Both were used.
2. We developed a list of key search terms for the read codes of interest. These were searched for in the description column. Appendix below provides a list of key search words.
3. Results from the key word search were used to identify the main stem codes where the Read codes of interest belong to.
4. The Next step involved searching the MedCode column for the main stem codes to pick out codes that were otherwise missed on searching the description column.
5. We then also conducted an online search of published articles that have published similar Read Codes (2, 3).
6. Once collected, they were split into possible, probable and definite. There was deliberation between clinicians in the THINKing group to achieve these three lists.
7. They were then hand over to a group of data scientists within the THINKing group who split them into various files following epidemiological principles and saved them in CSV files database.

References:

1. Health I. THIN Data Guide for Researchers. 2017(Version 3):108.
2. Mathur R, Bhaskaran K, Edwards E, Lee H, Chaturvedi N, Smeeth L, et al. Population trends in the 10-year incidence and prevalence of diabetic retinopathy in the UK: a cohort study in the Clinical Practice Research Datalink 2004-2014. *BMJ open*. 2017;7(2):e014444.
3. McEwan P, Bennett H, Ward T, Bergenheim K. Refitting of the UKPDS 68 risk equations to contemporary routine clinical practice data in the UK. *Pharmacoeconomics*. 2015;33(2):149-61.

Appendix 2: Search Terms for diabetic Retinopathy

Keywords for identifying diabetic retinopathy in the Read Codes Dictionary
O/E or *PHOTOGRAPHY* or *RETINAL* or *SCR* and *HAEMORRHAGES* or *EXUDATE* or *MICROANEURYSMS* or *INTRARETINAL MICROVASCULAR ANAOMALY* or *ABNORMALITY*
RETINA or *FUNDUS* or *MACULAR* or *VITREOUS* and *LASER" or *PHOTOCOAGULATION* or *INTRA-VITREAL INJECTIONS* or *INJECTIONS* or *RANIBIZUMAB* or *BIVACIZUMAB* or *AFLIBERCEPT* or *TRIAMCINOLON* or *ILEUVIEN* or *DEXAMETHOSON*
RETINOPATHY or *FUNDOSCOPY* or *SEEN or *RETINAL SCR* or *RETINOSCOPY* or *SLIT LAMP* or *DIABETIC EYE* or *EXAMINATION OF RETINA* or *RETINA and OTHER PARTS OF EYE OPERATIONS* or *VITRECTOMY* or *MACULOPATHY* or *BACKGROUND* or *PRE PROLIFERATIVE* or *PROLIFERATIVE*
*BLIND" or *PARTIAL SIGHTED" or **SIGHT IMPAIRMENT" or *VISUAL IMPAIRMENT" or *VISUAL FAILURE"

Appendix 3: Read Codes

Code	Description	Status
No Retinopathy (ROMO)		
2BBD.00	O/E - Right retina normal	Probable
2BBJ.00	O/E - no right diabetic retinopathy	Definite
2BB1.00	O/E - retina normal	Probable
2BBI.00	O/E - no retinopathy	Definite
3128000	Fundoscopy normal	Probable
3128200	Dilated fundoscopy normal	Probable
2BBM.00	O/E - diabetic maculopathy absent both eyes	Possible
Background Retinopathy (R1)		
2BBP.00	O/E - right eye background diabetic retinopathy	Definite
2BBQ.00	O/E - left eye background diabetic retinopathy	Definite
F420000	Background diabetic retinopathy	Definite
F421.00	Other background retinopathy	Definite
F421000	Unspecified background retinopathy	Definite
F421z00	Other background retinopathy NOS	Definite
2BB4.00	O/E - retinal microaneurysms	Definite
2BBa.00	O/E- non-referable retinopathy	Probable
Pre proliferative Diabetic Retinopathy (R2)		
F420200	Pre proliferative diabetic retinopathy	Definite
2BBR.00	O/E - right eye pre proliferative diabetic retinopathy	Definite
2BBS.00	O/E - left eye pre proliferative diabetic retinopathy	Definite
F420800	High risk non proliferative diabetic retinopathy	Definite
Proliferative Diabetic Retinopathy (R3)		
2BBk.00	O/E - right eye stable treated proliferative diabetic retinopathy	Definite
2BBI.00	O/E - left eye stable treated proliferative diabetic retinopathy	Definite
F420100	Proliferative diabetic retinopathy	Definite
F420700	High risk proliferative diabetic retinopathy	Definite
F422z00	Proliferative retinopathy NOS	Definite
F422.00	Other proliferative retinopathy	Definite
FyuF700	[X]Other proliferative retinopathy	Definite
2BBT.00	O/E - right eye proliferative diabetic retinopathy	Definite
2BBV.00	O/E - left eye proliferative diabetic retinopathy	Definite
7272500	Panretinal laser photocoagulation to lesion of retina NEC	Definite
7272800	Panretinal laser photocoagulation to lesion of retina	Definite
2BB7.00	O/E - retinal vascular proliferative	Probable
2BB8.00	O/E - vitreous haemorrhages	Probable
7276	Pan retinal photocoagulation for diabetes	Definite
F420500	Advanced diabetic retinal disease	Possible
F422y00	Other specified other proliferative retinopathy	Definite

F4K2800	Vitreous haemorrhage	Probable
FyuH400	[X]Vitreous haemorrhage in diseases classified elsewhere	Probable
2BB8.00	O/E - vitreous haemorrhages	Probable
Diabetic Maculopathy (M1)		
2BBL.00	O/E - Diabetic maculopathy present both eyes	Definite
2BBm.00	O/E - right eye clinically significant macular oedema	Definite
2BBn.00	O/E - left eye clinically significant macular oedema	Definite
2BBW.00	O/E - right eye diabetic maculopathy	Definite
2BBX.00	O/E - left eye diabetic maculopathy	Definite
F425900	Maculopathy	Definite
F42y900	Macular oedema	Definite
C10EP00	Type 1 diabetes mellitus with exudative maculopathy	Definite
C10EP11	Type I diabetes mellitus with exudative maculopathy	Definite
C10FQ00	Type 2 diabetes mellitus with exudative maculopathy	Definite
C10FQ11	Type II diabetes mellitus with exudative maculopathy	Definite
F420300	Advanced diabetic maculopathy	Definite
7272900	Focal laser photocoagulation of retina	Probable
F420400	Diabetic maculopathy	Definite
Referrable Retinopathy (R2, R3, M1)		
2BBY.00	O/E - referable retinopathy	Definite
2BBo.00	O/E - sight threatening diabetic retinopathy	Definite
Advanced diabetic retinal disease		
F420500	Advanced diabetic retinal disease	Definite

Code	Description	Status
Laser Procedures		
7276	Pan retinal photocoagulation for diabetes	Definite
7272012	Photocoagulation of the retina NEC	Definite
7272013	Laser therapy lesion of retina	Definite
7272300	Laser destruction of lesion of retina	Definite
7272500	Pan retinal laser photocoagulation to lesion of retina NEC	Definite
7272600	Laser photocoagulation to lesion of retina NEC	Definite
7272800	Pan retinal laser photocoagulation to lesion of retina	Definite
7272900	Focal laser photocoagulation of retina	Definite
2BBk.00	O/E - right eye stable treated proliferative diabetic retinopathy	Definite
2BBi.00	O/E - left eye stable treated proliferative diabetic retinopathy	Definite
2BBO.00	O/E - Laser photocoagulation scars	Definite
5B4..11	Retinal laser therapy	Definite
Z6F..11	Laser therapy	Definite

5B42.00	Laser therapy - retinal lesion	Definite
Vitreous/ Peribulbar procedures / haemorrhage		
7270D00	Injection of Ranibizumab into vitreous body	Definite
7270z00	Operation on vitreous body NOS	Definite
7270300	Injection into vitreous body NEC	Definite
7274800	Injection of therapeutic substance around the eye	Possible
727C200	Injection therapeutic substance posterior segment of eye NEC	Definite
7270D00	Injection of Ranibizumab into vitreous body	Definite
7L19E00	Injection of triamcinolone	Probable
727C100	Injection of steroid into posterior segment of eye	Definite
7270200	Injection of vitreous substitute into vitreous body	Definite
7277600	Injection of therapeutic substance into macula	Definite
7270C00	Injection of vitreous substitute into vitreous body NEC	Definite
727C100	Injection of steroid into posterior segment of eye	Definite
7270400	Pars plana vitrectomy	Definite
727Cy00	Other specified operations on posterior segment of eye	Probable
727Cz00	Operations on posterior segment of eye NOS	Probable
7273000	Epiretinal dissection	Possible
727C000	Insertion sustained release device posterior segment of eye	Definite
7270y00	Other specified operation on vitreous body	Definite
7270800	Internal tamponade of retina using liquid	Possible
7270900	Internal tamponade of retina using oil	Possible
7270A00	Removal of internal tamponade agent from vitreous body	Possible
7270411	Vitrectomy using pars plana approach	Probable
7270500	Air/gas exchange of vitreous	Possible
7270600	Internal tamponade of retina using gas	Probable
7270200	Injection of vitreous substitute into vitreous body	Probable
7270300	Injection into vitreous body NEC	Definite
7270400	Pars plana vitrectomy	Definite
7270	Operations on vitreous body	Probable
7270100	Extirpation of vitreous body NEC	Probable
F4K2800	Vitreous haemorrhage	Definite
FyuH400	[X]Vitreous haemorrhage in diseases classified elsewhere	Definite
2BB8.00	O/E - vitreous haemorrhages	Definite
Vision loss / blindness		
ZV52200	[V]Fitting or adjustment of artificial eye	Probable
ZV43000	[V]Has artificial eye globe	Probable
ZV43100	[V]Has artificial eye lens	Possible
FyuL.00	[X]Visual disturbances and blindness	Definite
F49z.11	Acquired blindness	Definite
F490900	Acquired blindness, both eyes	Definite
F495A00	Acquired blindness, one eye	Definite

F491.00	Better eye: low vision, Lesser eye: profound VI	Definite
F491500	Better eye: moderate VI, Lesser eye: blind, unspecified	Definite
F492300	Better eye: moderate VI, Lesser eye: low vision unspecified	Definite
F492500	Better eye: moderate VI, Lesser eye: moderate VI	Definite
F491700	Better eye: moderate VI, Lesser eye: near total VI	Definite
F491800	Better eye: moderate VI, Lesser eye: profound VI	Definite
F492400	Better eye: moderate VI, Lesser eye: severe VI	Definite
F491600	Better eye: moderate VI, Lesser eye: total VI	Definite
F490400	Better eye: near total VI, Lesser eye: near total VI	Definite
F490300	Better eye: near total VI, Lesser eye: total VI	Definite
F490200	Better eye: near total VI, Lesser eye: unspecified	Definite
F490700	Better eye: profound VI, Lesser eye: near total VI	Definite
F490800	Better eye: profound VI, Lesser eye: profound VI	Definite
F490600	Better eye: profound VI, Lesser eye: total VI	Definite
F490500	Better eye: profound VI, Lesser eye: unspecified	Definite
F491100	Better eye: severe VI, Lesser eye: blind, unspecified	Definite
F492100	Better eye: severe VI, Lesser eye: low vision unspecified	Definite
F491300	Better eye: severe VI, Lesser eye: near total VI	Definite
F491400	Better eye: severe VI, Lesser eye: profound VI	Definite
F492200	Better eye: severe VI, Lesser eye: severe VI	Definite
F491200	Better eye: severe VI, Lesser eye: total VI	Definite
8F62.00	Blind lead dog rehabilitation	Definite
8F6..11	Blind rehabilitation	Definite
8F61.00	Blind rehabilitation	Definite
ZN56800	Blind telephone user	Definite
F49..00	Blindness and low vision	Definite
F490z00	Blindness both eyes NOS	Definite
F490.00	Blindness, both eyes	Definite
F49A.00	Blindness, monocular	Definite
F495000	Blindness, one eye, unspecified	Definite
F490100	Both eyes total visual impairment	Definite
668C.00	Certificate of vision impairment	Definite
Fy1..00	Combined visual and hearing impairment	Definite
Fy1..12	Deafblind	Definite
ZN56A00	Deaf-blind telephone user	Definite
Fy1..11	Dual sensory impairment - deafblind	Definite
9m08.00	Exclu diab ret screen as blind	Definite
2BBr.00	Impair vision due diab retinop	Definite
F49..11	Impaired vision	Definite
ZK74.00	Issue of local authority blind registration	Definite
F494.00	Legal blindness USA	Definite
F496500	Lesser eye: moderate VI, Better eye: near normal vision	Definite
F496600	Lesser eye: moderate VI, Better eye: normal vision	Definite

F496400	Lesser eye: moderate VI, Better eye: unspecified	Definite
F495500	Lesser eye: near total VI, Better eye: near normal vision	Definite
F495600	Lesser eye: near total VI, Better eye: normal vision	Definite
F495400	Lesser eye: near total VI, Better eye: unspecified	Definite
F495800	Lesser eye: profound VI, Better eye: near normal vision	Definite
F495900	Lesser eye: profound VI, Better eye: normal vision	Definite
F495700	Lesser eye: profound VI, Better eye: unspecified	Definite
F496200	Lesser eye: severe VI, Better eye: near normal vision	Definite
F496300	Lesser eye: severe VI, Better eye: normal vision	Definite
F496100	Lesser eye: severe VI, Better eye: unspecified	Definite
F495200	Lesser eye: total VI, Better eye: near normal vision	Definite
F495300	Lesser eye: total VI, Better eye: normal vision	Definite
F495100	Lesser eye: total visual impairment, Better eye: unspecified	Definite
F49..12	Low vision	Definite
F492.00	Low vision, both eyes	Definite
F492z00	Low vision, both eyes NOS	Definite
F492000	Low vision, both eyes unspecified	Definite
F496.00	Low vision, one eye	Definite
F496z00	Low vision, one eye NOS	Definite
F496000	Low vision, one eye, unspecified	Definite
F498.00	Moderate visual impairment, binocular	Definite
F49C.00	Moderate visual impairment, monocular	Definite
2B7A.11	O/E - blind L-eye	Definite
2B6A.11	O/E - blind R-eye	Definite
22E6.11	O/E - false eye	Definite
22E6.00	O/E - glass (prosthetic) eye	Definite
22E6.12	O/E - glass eye	Definite
22EF.00	O/E - has one eye	Definite
2B7B.00	O/E - L-eye completely blind	Definite
2B7C.00	O/E - L-eye sees hand movements	Definite
2B7T.00	O/E - L-eye visual acuity (corrected) 1/60	Definite
2B7V.00	O/E - L-eye visual acuity (corrected) 2/60	Definite
2B7W.00	O/E - L-eye visual acuity (corrected) 4/60	Definite
2B7X.00	O/E - L-eye visual acuity (corrected) 5/60	Definite
2B7S.00	O/E - pinhole L-eye completely blind	Definite
2B7Q.00	O/E - pinhole L-eye counts fingers only	Definite
2B7R.00	O/E - pinhole L-eye perceives light only	Definite
2B7P.00	O/E - pinhole L-eye sees hand movements	Definite
2B6S.00	O/E - pinhole R-eye completely blind	Definite
2B6Q.00	O/E - pinhole R-eye counts fingers only	Definite
2B6R.00	O/E - pinhole R-eye perceives light only	Definite
2B6P.00	O/E - pinhole R-eye sees hand movements	Definite
2B7L.00	O/E - pinhole visual acuity L-eye=6/60	Definite

2B6L.00	O/E - pinhole visual acuity R-eye=6/60	Definite
22E6.13	O/E - prosthetic eye	Definite
2B6B.00	O/E - R-eye completely blind	Definite
2B6C.00	O/E - R-eye sees hand movements	Definite
2B6T.00	O/E - R-eye visual acuity (corrected) 1/60	Definite
2B6V.00	O/E - R-eye visual acuity (corrected) 2/60	Definite
2B6W.00	O/E - R-eye visual acuity (corrected) 4/60	Definite
2B6X.00	O/E - R-eye visual acuity (corrected) 5/60	Definite
2B7E.00	O/E - visual acuity L-eye=3/60	Definite
2B78.00	O/E - visual acuity L-eye=6/60	Definite
2B6E.00	O/E - visual acuity R-eye=3/60	Definite
2B68.00	O/E - visual acuity R-eye=6/60	Definite
2B79.00	O/E -L-eye counts fingers only	Definite
2B69.00	O/E -R-eye counts fingers only	Definite
2B7A.00	O/E-L-eye perceives light only	Definite
2B6A.00	O/E-R-eye perceives light only	Definite
F491000	One eye blind, one eye low vision	Definite
F491z00	One eye blind, one eye low vision NOS	Definite
Z9E2.00	Optical low vision aid provision	Definite
F49..13	Partial sight	Definite
F495z00	Profound impairment one eye NOS	Definite
F495.00	Profound impairment, one eye	Definite
Z96..00	Provision for visual and hearing impairment	Definite
Z9E5400	Provision of ancillary low vision aid	Definite
Z9E1100	Provision of artificial eye	Definite
Z962.00	Provision of communicator for visual and hearing impairment	Definite
Z9E5100	Provision of electronic low vision aid	Definite
Z961.00	Provision of guide help for visual and hearing impairment	Definite
Z9E3200	Provision of low vision hand magnifier	Definite
Z9E3400	Provision of low vision headband magnifier	Definite
Z9E3300	Provision of low vision stand magnifier	Definite
Z9E3100	Provision of magnifier low vision aid - near	Definite
Z9E5.00	Provision of non-optical low vision aid	Definite
Z9E4.00	Provision of optical low vision aid - distance	Definite
Z9E3.00	Provision of optical low vision aid - near	Definite
Z9E1200	Provision of removable artificial eye	Definite
Z9E3500	Provision of spectacle low vision aid - near	Definite
8HIE.00	Referral to visual impairment multidisciplinary team	Definite
6689	Registered blind	Definite
6688.11	Registered partially blind	Definite
6688	Registered partially sighted	Definite
6689.11	Registered severely sight impaired	Definite
668D.00	Registered sight impaired	Definite

8D36.00	Removable artificial eye	Definite
9Nfb.00	Requires deafblind block alphabet interpreter	Definite
9NfB.00	Requires deafblind communicator guide	Definite
9Nfc.00	Requires deafblind haptic communication interpreter	Definite
9Nfa.00	Requires deafblind manual alphabet interpreter	Definite
F497.00	Severe visual impairment, binocular	Definite
F49B.00	Severe visual impairment, monocular	Definite
F49..14	Sight impaired	Definite
F490000	Unspecified blindness both eyes	Definite
1a00000	Uses guide dog for the blind	Definite
F49D.00	Visual impairment	Definite
F493.00	Visual loss, both eyes unqualified	Definite
F49y.00	Visual loss, one eye, unqualified	Definite
F404200	Blind hypertensive eye	Definite
F404100	Blind hypotensive eye	Definite
Z9E3900	Near low vision aid - clip-on spectacle magnifier	Definite
Z9E3C00	Near low vision aid - clip-on spectacle telescope	Definite
Z9E3D00	Near low vision aid - extra cap for telescope	Definite
Z9E3800	Near low vision aid - integral spectacle magnifier	Definite
Z9E3B00	Near low vision aid - integral spectacle telescope	Definite
9NID.00	Seen by visual impairment teacher	Definite
1B75.00	Loss of vision, Severe visual loss	Definite
1B77.00	Deteriorating vision, Severe visual loss	Definite

Unclassifiable

Code	Description
2BB5.00	O/E - retinal haemorrhages
2BB6.00	O/E - retinal exudates
2BBF.00	Retinal abnormality-diabetes related
2BBr.00	Impaired vision due diab retinop
C105.00	Diabetes mellitus with ophthalmic manifestation
C105000	Diabetes mellitus, juvenile type, + ophthalmic manifestation
C105100	Diabetes mellitus, adult onset, + ophthalmic manifestation
C105y00	Other specified diabetes mellitus with ophthalmic complicatn
C105z00	Diabetes mellitus NOS with ophthalmic manifestation
C108100	Insulin-dependent diabetes mellitus with ophthalmic comps
C108111	Type I diabetes mellitus with ophthalmic complications
C108112	Type 1 diabetes mellitus with ophthalmic complications
C108700	Insulin dependent diabetes mellitus with retinopathy
C108711	Type I diabetes mellitus with retinopathy
C108712	Type 1 diabetes mellitus with retinopathy
C109100	Non-insulin-dependent diabetes mellitus with ophthalmic comps

C109111	Type II diabetes mellitus with ophthalmic complications
C109112	Type 2 diabetes mellitus with ophthalmic complications
C109600	Non-insulin-dependent diabetes mellitus with retinopathy
C109611	Type II diabetes mellitus with retinopathy
C109612	Type 2 diabetes mellitus with retinopathy
C10A300	Malnutrit-related diabetes mellitus wth ophthalmic complicat
C10E100	Type 1 diabetes mellitus with ophthalmic complications
C10E111	Type I diabetes mellitus with ophthalmic complications
C10E112	Insulin-dependent diabetes mellitus with ophthalmic comps
C10E700	Type 1 diabetes mellitus with retinopathy
C10E711	Type I diabetes mellitus with retinopathy
C10E712	Insulin dependent diabetes mellitus with retinopathy
C10F600	Type 2 diabetes mellitus with retinopathy
C10F611	Type II diabetes mellitus with retinopathy
F420.00	Diabetic retinopathy
F420600	Non proliferative diabetic retinopathy
F420z00	Diabetic retinopathy NOS
F421.11	Microvascular retinal changes
2BB5.00	O/E - retinal haemorrhages
2BBM.00	O/E - diabetic maculopathy absent both eyes

Appendix 4: Summary of Prevalence Trends 1998 to 2018

Decade	Prevalence estimate at the start of the decade	Prevalence estimate at the end of the decade	Percentage increase in prevalence within the decade	Percentage increase in prevalence between the decades
STR in T1DM in two decades				
1998 to 2007	8.15	17.57	216%	
2009 to 2018	20.54	30.22	147%	371%
STR in T2DM in two decades				
1998 to 2007	4.36	8.1	186%	
2009 to 2018	9.01	11.15	124%	256%
DR in T1DM in two decades				
1998 to 2007	26.62	40.32	151%	
2009 to 2018	45.39	57.75	127%	217%
DR in T2DM in two decades				
1998 to 2007	11.53	20.06	174%	
2009 to 2018	23.7	32.64	138%	283%
STR in DM in two decades				
1998 to 2007	4.87	8.84	182%	
2009 to 2018	9.86	12.48	127%	256%
DR in DM in two decades				
1998 to 2007	13.57	21.64	159%	
2009 to 2018	25.3	34.39	136%	253%
T1DM in two decades				
1998 to 2007	0.31%	0.32%	104%	
2009 to 2018	0.33%	0.41%	123%	132%
T2DM in two decades				
1998 to 2007	1.91%	3.65%	191%	
2009 to 2018	4.01%	5.24%	131%	273%

Appendix 5: Future projections

In the four figures below, the grey area is the prediction band (95% confidence interval) and signifies the uncertainty of the estimates.

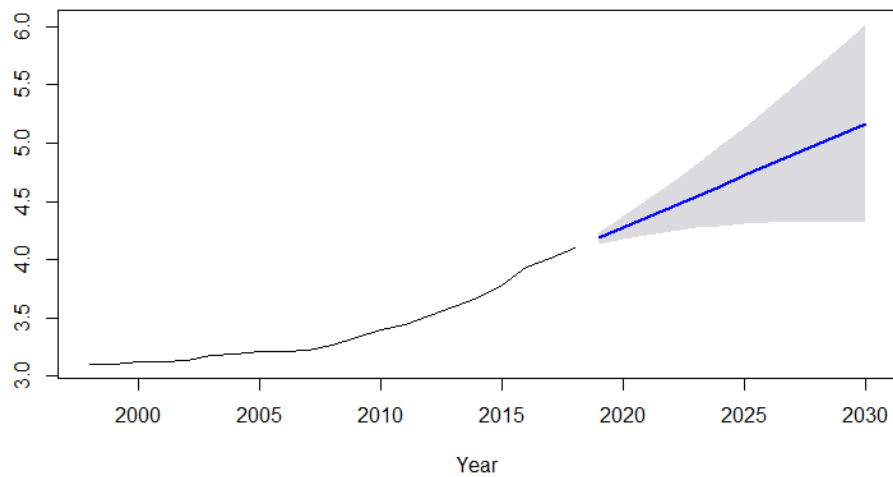


Figure 1: T1DM Projections / 1000 individuals

X axis is calendar years and Y axis is prevalence (cases per 1000 individuals general population), starts at 3.0

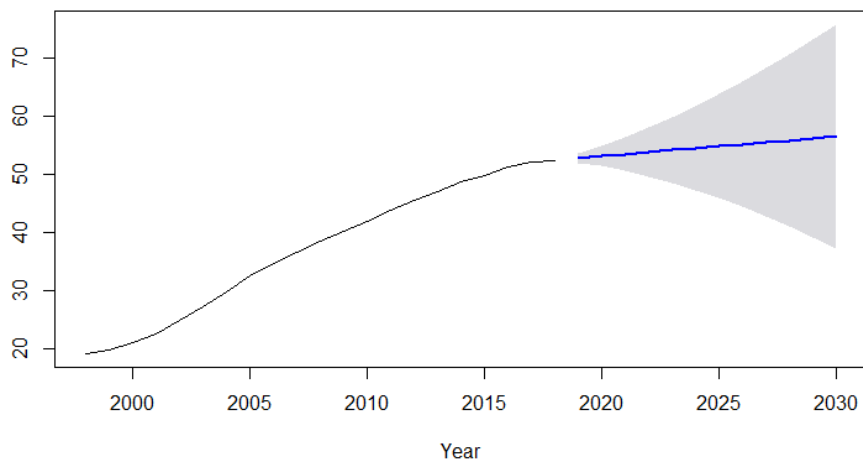


Figure 2: T2DM Projections / 1000 individuals

X axis is calendar years and Y axis is prevalence (cases per 1000 individuals general population) starts at 17

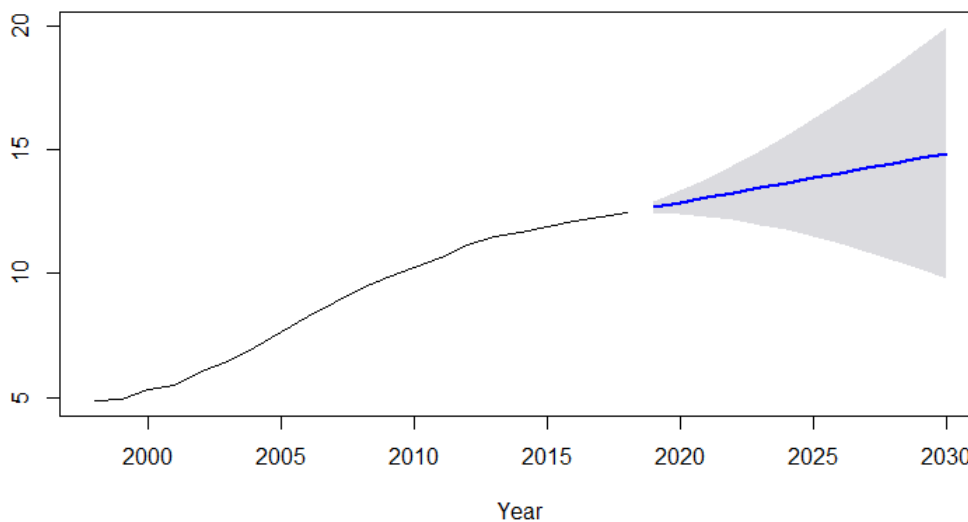


Figure 3: STR Projections (%)

X axis is calendar years and Y axis is prevalence (cases per 100 individuals with diabetes) starts at 4

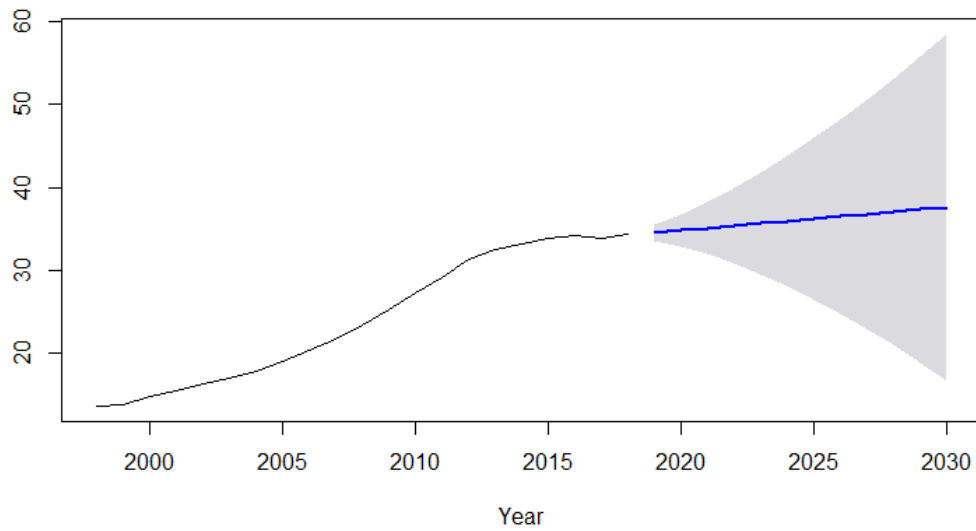


Figure 4: DR Projections (%)

X axis is calendar years and Y axis is prevalence (cases per 100 individuals with diabetes), starts at

10

Annual Prevalence Diabetes Mellitus per 1000 Population and Diabetic Retinopathy per 100 diabetic population (95% PI)

Year	T1DM Forecast			T2DM Forecast			DR Forecast			STR Forecast		
	Forecast	Low 95	High 95	Forecast	Low 95	High 95	Forecast	Low 95	High 95	Forecast	Low 95	High 95
2019	4.2	4.1	4.2	52.7	51.9	53.6	34.5	33.5	35.5	12.7	12.4	12.9
2020	4.3	4.2	4.4	53.1	51.4	54.8	34.8	32.9	36.7	12.9	12.4	13.3
2021	4.4	4.2	4.5	53.4	50.6	56.3	35.1	31.9	38.2	13.1	12.3	13.8
2022	4.5	4.2	4.7	53.8	49.6	57.9	35.4	30.8	39.9	13.3	12.2	14.4
2023	4.5	4.3	4.8	54.1	48.5	59.7	35.6	29.5	41.8	13.5	12.0	15.0
2024	4.6	4.3	5.0	54.4	47.2	61.6	35.9	28.1	43.8	13.7	11.8	15.6
2025	4.7	4.3	5.1	54.8	45.8	63.7	36.2	26.5	45.9	13.9	11.5	16.2
2026	4.8	4.3	5.3	55.1	44.3	65.9	36.5	24.7	48.2	14.1	11.2	16.9
2027	4.9	4.3	5.5	55.4	42.7	68.2	36.8	22.9	50.6	14.3	10.9	17.6
2028	5.0	4.3	5.7	55.8	41.0	70.6	37.0	20.9	53.2	14.5	10.5	18.4
2029	5.1	4.3	5.8	56.1	39.1	73.1	37.3	18.8	55.8	14.7	10.2	19.1
2030	5.2	4.3	6.0	56.4	37.2	75.7	37.6	16.7	58.5	14.9	9.8	19.9

Appendix 6: Previous prevalence studies compared with IMRD based analysis

Publication	Population	T1DM	T2DM	Any DM
Younis et al (1)	Liverpool diabetic retinopathy screening programme 1991 to 1999 – baseline prevalence at entry into the programme	Any DR 45.7% STED 16.4% PDR 3.7%	Any DR 25.3% STED 6.0% PDR 0.5%	
Misra et al (2)	Norwich Diabetic retinopathy screening programme 2006 with dynamic cohort design with repeated measures			Any DR 25.6% STDR 0.6% PPDR 4.6% PDR 0.08% Maculopathy 0.44% Referable (R2, R3, M1) retinopathy 4.7%
Thomas (3) and Minassian et al (4)	Welsh Diabetic retinopathy screening programme 2005 to 2009 and application to England	Any DR 56.3% STDR 11.2%	Any DR 30.9% STDR 2.9%	Any DR 32.4% STDR 3.4% Diabetic Macular Oedema 7.12%
Looker et al (5)	Newly diagnosed type 2 diabetes attending Scottish National screening programme 2005 to 2008. prevalence at first screening		Any DR 19.3% Referable DR 1.9% PPDR ± any maculopathy 0.4% PDR ± any maculopathy 0.3%	

Mathur et al (6)	CPRD based UK wide study 2014 - crude prevalence rate	Any DR 54.8% Severe DR 8.1%	Any DR 30.6% Severe DR 1.2%	Any DR 32.6% Severe DR 1.8%
The present study	IMRD based cross sectional study - 2017	Any DR 57.8% STR 30.2% Any maculopathy 19.62%	Any DR 32.6% STR 11.2% Any maculopathy 6.99%	Any DR 34.4% STR 12.3% Any maculopathy 7.86%

References:

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6. Mathur R, Bhaskaran K, Edwards E, Lee H, Chaturvedi N, Smeeth L, et al. Population trends in the 10-year incidence and prevalence of diabetic retinopathy in the UK: a cohort study in the Clinical Practice Research Datalink 2004-2014. *BMJ open*. 2017;7(2):e014444.

Appendix 7: Previous publications reporting trends in prevalence rates of DR in the UK compared with IMRD based analysis

Publication	Population	T1DM	T2DM	Any DM
Misra et al (1)	Norwich Diabetic retinopathy screening programme 1990 to 2006 (Mostly Type 2) with dynamic cohort design with repeated measures			All DR prevalence increased from 23.2% to 25.3% Referable DR increased from 2 to 4.7%
Mathur et al (2)	CPRD based UK wide study population from 2004 to 2014	All DR remained stable at 55% Severe DR increased from 3.5% in 2004 to 8.0% in 2014	All DR reduced from 24.6% in 2004 to 23.1% in 2014 Severe DR increased from 0.3% in 2004 to 0.9% in 2014	All DR prevalence decreased from 2.6% to 2.2% Severe DR remained stable at 0.1%
This study	IMRD based serial cross-sectional studies 1998 to 2018			

References:

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2. Mathur R, Bhaskaran K, Edwards E, Lee H, Chaturvedi N, Smeeth L, et al. Population trends in the 10-year incidence and prevalence of diabetic retinopathy in the UK: a cohort study in the Clinical Practice Research Datalink 2004-2014. *BMJ open.* 2017;7(2):e014444.