

**Appendix 1: Tables giving details of models**

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Table 1.1: Search strategy of the rapid reviews

<b>Epidemiological models</b>	
<b>Web of Science</b>	from All Databases You searched for: TOPIC: ("diabet*" OR "type 2 diabetes" OR "diabetes mellitus") AND TITLE: ("Engl*" OR "United Kingdom" OR "UK") AND TOPIC: ("model" OR "simulation" OR "project*") AND TOPIC: ("epidemiolog*" OR "prevalence" OR "incidence" OR "trend*") NOT TITLE: ("child*") Refined by: LANGUAGES: ( ENGLISH ) Timespan: All years. Search language=Auto
<b>PubMed</b>	(((((("diabet*" OR "type 2 diabetes" OR "diabetes mellitus")) AND ("Engl*" OR "UK" OR "United Kingdom")) AND ("model" OR "simulation" OR "project*")) AND ("epidemiolog*" OR "prevalence" OR "incidence" OR "trend*")) NOT "child*" AND Humans[Mesh]) AND Humans[Mesh] AND English[lang] AND (Humans[Mesh] AND English[lang]))
<b>Markov chain models</b>	
<b>Web of science</b>	TITLE: ("diabet*" OR "type 2 diabetes" OR "diabetes mellitus" OR "pre-diabetes" OR "prediabetes") AND TITLE: ("economic evaluation" OR "cost-effectiveness" OR "cost effectiveness" OR "cost-utility" OR "cost utility") AND TOPIC: ("Markov") NOT TOPIC: ("child*") Refined by: LANGUAGES: ( ENGLISH ) Timespan: All years. Search language=Auto
<b>PubMed</b>	((("diabet*" OR "type 2 diabetes" OR "diabetes mellitus" OR "prediabetes" OR "pre-diabetes") AND ("economic evaluation" OR "cost-effectiveness" OR "cost effectiveness" OR "cost-utility" OR "cost utility")) AND "Markov" NOT "child") AND ("humans"[MeSH Terms] AND English[lang]))

**Table 1.2: Measures of intermediate hyperglycaemia used in Markov chain models**

Measure of intermediate hyperglycaemia	Definition
Impaired Fasting Glucose (IFG)	<ul style="list-style-type: none"> <li>Diagnosed with an Oral Glucose Tolerance Test (OGTT) performed after an overnight fast</li> <li>Defined by a Fasting Plasma Glucose (FPG) concentration of <ul style="list-style-type: none"> <li>5.6-6.9 mmol/L according to the American Diabetes Association (ADA)[1]</li> <li>6.0-6.9 mmol/L according to the World Health Organization (WHO)[2]</li> </ul> </li> </ul>
Impaired Glucose Tolerance (IGT)	<ul style="list-style-type: none"> <li>Diagnosed with a 2-hour Glucose Tolerance Test (2hrGTT), i.e. a blood test performed 2 hours after a 75-g glucose load</li> <li>Defined by 2-h plasma glucose concentration of <ul style="list-style-type: none"> <li>7.8-11 mmol/L according to the American Diabetes Association (ADA)[1]</li> <li>7-11 mmol/L according to the World Health Organization (WHO)[2]</li> </ul> </li> </ul>
Glycated Haemoglobin (HbA1c)	<ul style="list-style-type: none"> <li>Diagnosed with the HbA1c test, measuring the average blood glucose over 2-3 months</li> <li>Defined by HbA1c concentration of <ul style="list-style-type: none"> <li>39-47 mmol/mol (5.7-6.4%) according to the American Diabetes Association (ADA)[1]</li> <li>42-47 mmol/mol (6.0-6.4%) according to the World Health Organization (WHO)[3]</li> </ul> </li> </ul>

**Table 1.3: Data sources of estimates used by our Markov Chain models**

<b>Estimate</b>	<b>Year(s)</b>	<b>Source</b>
Estimated prevalence of intermediate hyperglycaemia (based on HbA1c)	2015	Public Health England[4]
Estimated prevalence of diabetes (both types)	2015	Public Health England[5]
Estimated prevalence of normoglycaemia: residual of the population for 2015	2015	Office of National Statistics[6]
Age distributions for those with intermediate hyperglycaemia & diabetes	Five years of combined data from 2009 to 2013	Health Surveys for England (HSE)[7]
Mortality rates by age	2015	Office of National Statistics[6]
Hazard ratios for those with diabetes & T2D	2015-16	National Diabetes Audit[8]
Hazard ratios for those for those with intermediate hyperglycaemia	Various years	Systematic review[9]

**Table 1.4: Ratios comparing different estimates**

Numerator	Denominator	Ratio	Sources
Diagnosed prevalence of diabetes	True prevalence of diabetes	75%	[10,11]
Prevalence of T2D	Prevalence of diabetes	90%	[12]
Prevalence of diabetics aged over 80 (England) in 2015, 2030 & 2035	Prevalence of diabetics aged 20 to 79 (England) in 2030 & 2035	<ul style="list-style-type: none"><li>• 2015: 18%</li><li>• 2030: 26%</li><li>• 2035: 29%</li></ul>	[6, 7]

**Table 1.5: The three sets of transition probabilities used in different models**

	<b>Model 1*</b>	<b>Model 2**</b>	<b>Model 3***</b>
Normoglycaemia – Normoglycaemia	0.925	0.925	0.831
Normoglycaemia – Intermediate hyperglycaemia	0.069	0.069	0.163
Normoglycaemia – T2D	0.000	0.000	0.000
Normoglycaemia – Dead	0.006	0.006	0.006
<i>Totals</i>	<i>1.000</i>	<i>1.000</i>	<i>1.000</i>
Intermediate hyperglycaemia -Intermediate hyperglycaemia	0.856	0.878	0.755
Intermediate hyperglycaemia- Normoglycaemia	0.090	0.090	0.162
Intermediate hyperglycaemia – T2D	0.036	0.013	0.060
Intermediate hyperglycaemia – Dead	0.019	0.019	0.023
<i>Totals</i>	<i>1.000</i>	<i>1.000</i>	<i>1.000</i>
T2D-T2D	0.977	0.977	0.973
T2D – Normoglycaemia	0.000	0.000	0.000
T2D- Intermediate hyperglycaemia	0.000	0.000	0.005
T2D – Dead	0.023	0.023	0.022
<i>Totals</i>	<i>1.000</i>	<i>1.000</i>	<i>1.000</i>

Notes:

\* Model 1 is based on the transition probabilities from Roberts et al[14] for HbA1c.

\*\* Model 2 is based on Model 1 modified to generate the PHE projections of the prevalence of T2D: the transition probability from intermediate hyperglycaemia to T2D of Model 2 (0.013) is a third of that of Model 1 (0.036); and has a corresponding increase in the transition probability of remaining as intermediate hyperglycaemia (0.836 to 0.878).

\*\*\* Model 3 is based on the transition probabilities from Neuman et al[15] for IGT.

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