

Online supplementary material

Comparing different definitions of pre-diabetes with subsequent risk of diabetes: An individual participant data meta-analysis involving 76,513 individuals and 8208 cases of incident diabetes

Obesity, Diabetes and Cardiovascular Disease Collaboration

Study investigators

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sTable 1: Characteristics of participants by study: mean (standard deviation) unless stated

Study	Country	Baseline year	N	Female (%)	Follow-up (years)	DM incidence cases*	Baseline							
							Age (years)	FPG† (mmol/L)	2hPG† (mmol/L)	HbA1c (%)	BMI (kg/m ²)	SBP (mmHg)	Current smoker (%)	Family diabetes history (%)
AICHI (Ref1)	Japan	2005, 2007	5281	19.3	5.4 (2.0)	259	47.4 (7.0)	5.1 (0.5)	-	-	22.9 (2.8)	124.3 (16.0)	24.7	-
ARIC (Ref2)	USA	1987-1989	12061	54.5	13.2 (8.1)	2286	54.0 (5.7)	5.5 (0.5)	-	-	27.2 (5.0)	119.7 (18.0)	25.6	22.3
AUSDIAB (Ref3)	Australia	1999-2000	6558	55.0	10.1 (3.2)	464	50.5 (12.7)	5.4 (0.6)	6.0 (1.8)	5.1 (0.3)	26.7 (4.7)	127.8 (17.4)	12.1	18.3
CARDIA (Ref4)	USA	1985-1986	4797	55.8	21.4 (6.0)	626	24.9 (3.6)	4.5 (0.5)	-	-	24.5 (5.0)	110.4 (11.1)	29.1	15.5
FAMAS (Ref5)	Australia	2002-2005	798	0	4.9 (0.6)	59	53.7 (11.1)	4.7 (0.7)	-	5.5 (0.4)	28.3 (4.1)	136.4 (18.1)	17.8	27.8
GOS (Ref6)	Australia	1994-1997	639	100	9.5 (1.2)	30	47.3 (14.3)	5.3 (0.5)	-	-	26.2 (5.1)	120.2 (19.8)	14.4	36.0
JHS (Ref7)	USA	2000-2004	3419	63.4	7.3 (1.8)	465	53.6 (12.5)	5.0 (0.5)	-	5.5 (0.5)	31.4 (7.2)	125.9 (16.1)	11.8	45.5
MCCS (Ref8)	Australia	1990-1994	17025	61.2	11.7 (1.8)	1445	54.8 (8.4)	5.5 (0.5)	-	-	26.5 (4.2)	135.3 (18.1)	8.3	17.6
MCDS (Ref9)	Mexico	1990-1992	1690	59.3	11.8 (5.8)	333	46.3 (8.0)	4.6 (0.7)	5.9 (2.0)	-	28.1 (4.3)	116.6 (16.7)	32.8	32.5

MESA (Ref10)	USA	2000-2002	5532	53.2	7.7 (2.7)	564	51.6 (10.2)	5.0 (0.6)	-	-	28.0 (5.3)	125.1 (20.9)	12.8	-
NWAHS (Ref11)	Australia	1999-2000, 2002-2003	3062	53.2	6.7 (2.3)	155	50.4 (15.6)	5.0 (0.7)	-	5.4 (0.5)	27.7 (5.2)	127.4 (17.8)	20.2	10.3
PSWG (Ref12)	Sweden	1968	1320	100	18.3 (7.2)	113	46.7 (6.2)	4.1 (0.7)	-	-	24.0 (3.7)	132.5 (21.3)	41.8	15.2
TLGS (Ref13)	Iran	1999-2001	4409	57.4	11.1 (3.7)	780	41.1 (13.9)	5.0 (0.6)	6.1 (2.0)	-	26.6 (4.6)	118.0 (17.9)	13.6	25.8
TOYAMA (Ref14)	Japan	2009	6507	33.6	5.0 (1.4)	185	41.5 (11.8)	5.2 (0.6)	-	5.3 (0.4)	22.9 (3.3)	116.8 (16.3)	27.9	15.4
ULSAM (Ref15)	Sweden	1970-1973	1881	0	21.7 (10.0)	294	49.6 (06)	4.9 (0.5)	-	-	25.0 (3.1)	132.5 (17.6)	34.4	15.5
VIVA (Ref16)	Spain	1996-1997	1534	56.1	11.0 (1.7)	150	48.3 (8.4)	5.1 (0.6)	5.5 (1.7)	-	27.5 (4.4)	125.2 (19.5)	30.3	21.9
Total			76513	51.7	11.1 (6.3)	8208	49.6 (12.7)	5.2 (0.6)	6.0 (1.9)	5.3 (0.4)	26.3 (5.0)	125.0 (19.1)	19.1	20.8

*Diabetes is defined as FPG \geq 7.0 mmol/L, self-report, or use of anti-diabetic medication;

† To convert from mmol/L to mg/dl: divide value by 0.0555

DM = diabetes mellitus; WHO = World Health Organization; FPG = fasting plasma glucose; ADA = American Diabetes Association; 2hPG = 2 hour post-load plasma glucose; HbA1c = glycated haemoglobin; BMI = body mass index; SBP = systolic blood pressure; AICHI = Aichi Workers' Cohort Study; ARIC = Atherosclerosis Risk in Communities Study; AUSDIAB = Australian Diabetes, Obesity and Lifestyle Study; CARDIA = Coronary Artery Risk Development in Young Adults Study; FAMAS = Florey Adelaide Male Ageing Study; GOS = Geelong Osteoporosis Study; JHS = Jackson Heart Study; MCCS = Melbourne Collaborative Cohort Study; MCDS = Mexico City Diabetes Study; MESA = Multi-Ethnic Study of Atherosclerosis; NWAHS = North

West Adelaide Health Study; PSWG = Prospective Population Study of Women in Gothenburg; TLGS = Tehran Lipid and Glucose Study; TOYAMA = Toyama Prefecture Study; ULSAM = Uppsala Longitudinal Study of Adult Men; VIVA = Variability of Insulin with Visceral Adiposity project;

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- Ref9 Gonzalez C, Stern MP, Gonzalez E et al. The Mexico City Diabetes Study: a population-based approach to the study of genetic and environmental interactions in the pathogenesis of obesity and diabetes. *Nutr Rev* 1999;57:S71-6.
- Ref10 Bild DE, Bluemke DA, Burke GL et al. Multi-Ethnic Study of Atherosclerosis: objectives and design. *Am J Epidemiol* 2002;156:871-81.
- Ref11 Grant JF, Taylor AW, Ruffin RE et al. Cohort profile: The North West Adelaide Health Study 9NWAHS). *Int J Epidemiol* 2009;38:1479-86.
- Ref12 Bengtsson C, Ahlqvist M, Andersson K et al. The prospective Population Study of Women in Gothenburg, Sweden, 1968-69 to 1992-93. A 24-year follow-up stud with special reference to participation, representativeness, and mortality. *Scand J Prim Health Care* 1997;15:214-9.
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- Ref14 Sakurai M, Nakamura K, Miura K et al. Dietary carbohydrate intake, presence of obesity and the incident risk of type 2 diabetes in Japanese men. *J Diabetes Investig* 2016;7:343-51.
- Ref15 Lithell H, Sundstrom J, Arnlov J et al. Epidemiological and clinical studies on insulin resistance and diabetes. *Ups J Med Sci* 2000;105:135-50.
- Ref16 Pladevall M, Singal B, Williams LK et al. A single factor underlies the metabolic syndrome. A confirmatory factor analysis. *Diabetes Care* 2006;29:113-22.

sTable 2: Prediabetes conversion to diabetes by pre-diabetes definition

Study	Pre-diabetes conversion to diabetes (per 1000 person years)				
	WHO-FPG	ADA-FPG	2hPG	ADA-HbA1c	IEC-HbA1c
AICHI	87.3	36.3	-	-	-
ARIC	57.5	29.0	-	-	-
AUSDIAB	36.2	15.2	30.5	87.7	154.3
CARDIA	20.0	15.5	-	-	-
FAMAS	113.0	80.8	-	48.8	95.6
GOS	22.4	11.2	-	-	-
JHS	136.8	76.6	-	49.0	83.4
MCCS	24.6	13.5	-	-	-
MCDS	92.0	69.7	54.1	-	-
MESA	138.4	70.3	-	-	-
NWAHS	53.3	26.3	-	31.0	51.1
PSWG	49.3	18.6	-	-	-
TLGS	107.8	66.4	62.2	-	-
TOYAMA	99.3	36.6	-	42.0	113.4
ULSAM	32.2	17.9	-	-	-
VIVA	30.8	21.0	36.5	-	-
Total	45.7	23.7	43.8	45.2	79.4

WHO = World Health Organization; FPG = fasting plasma glucose; ADA = American Diabetes Association; 2hPG = 2 hour post-load plasma glucose; HbA1c = glycated haemoglobin; IEC = International Expert Committee; AICHI = Aichi Workers' Cohort Study; ARIC = Atherosclerosis Risk in Communities Study; AUSDIAB = Australian Diabetes, Obesity and Lifestyle Study; CARDIA = Coronary Artery Risk Development in Young Adults Study; FAMAS = Florey Adelaide Male Ageing Study; GOS = Geelong Osteoporosis Study; JHS = Jackson Heart Study; MCCS = Melbourne Collaborative Cohort Study; MCDS = Mexico City Diabetes Study; MESA = Multi-Ethnic Study of Atherosclerosis; NWAHS = North West Adelaide Health Study; PSWG = Prospective Population Study of Women in Gothenburg; TLGS = Tehran Lipid and Glucose Study; TOYAMA = Toyama Prefecture Study; ULSAM = Uppsala Longitudinal Study of Adult Men; VIVA = Variability of Insulin with Visceral Adiposity project;

sTable 3: Pooled hazard ratios (HR) and 95% confidence intervals (CI) for incident diabetes associated with pre-diabetes status at baseline by country/geographical region

Pre-diabetes definition	Subgroup	Multiple adjusted*			Heterogeneity between subgroup p-value
		n	Hazard ratio (95% CI)†	I ² (%)	
WHO-FPG	Australia	27368	4.67 (3.04, 7.19)	89.8	0.128
	Europe	4683	3.59 (2.67, 4.82)	8.8	
	Iran	4289	5.41 (4.45, 6.58)	-	
	Japan	9739	12.21 (7.19, 20.74)	84.2	
	North America	27072	5.92 (3.71, 9.44)	95.5	
ADA-FPG	Australia	27368	3.56 (2.73, 4.64)	75.1	0.133
	Europe	4683	2.70 (2.20, 3.32)	0	
	Iran	4289	4.98 (4.27, 5.80)	-	
	Japan	9739	7.32 (3.88, 13.80)	88.0	
	North America	27072	4.57 (2.89, 7.24)	96.7	
2hPG	Australia	5763	4.82 (3.93, 5.91)	-	0.303
	Iran	3956	3.98 (3.38, 4.68)	-	
	Mexico	1644	3.20 (2.52, 4.06)	-	
	Spain	1483	3.04 (2.17, 4.26)	-	
ADA-HbA1c	Australia	9720	5.68 (2.77, 11.64)	93.5	0.505
	Japan	6481	29.95 (19.09, 46.99)	-	
	USA	3174	5.67 (4.58, 7.02)	-	
IEC-HbA1c	Australia	9720	6.54 (3.70, 11.57)	87.0	0.555
	Japan	6481	23.35 (16.51, 33.03)	-	
	USA	3174	6.26 (5.20, 7.53)	-	

WHO = World Health Organization; FPG = fasting plasma glucose; ADA = American Diabetes Association; 2hPG = 2 hour post-load plasma glucose; HbA1c = glycated haemoglobin; IEC = International Expert Committee; Europe = Spain, Sweden; North America = Mexico, USA; CI = confidence intervals;

* Adjusted for age, body mass index, systolic blood pressure, smoking, and family history of diabetes

† Normal (i.e. non pre-diabetes or diabetes) was the reference group, see Table 1 for the respective definitions;

sTable 4: Pooled hazard ratios (HR) and 95% confidence intervals (CI) for incident diabetes associated with pre-diabetes status at baseline by obesity status

Pre-diabetes definition	Subgroup	Multiple adjusted*			Heterogeneity between subgroup p-value
		n	Hazard ratio (95% CI)†	I ² (%)	
WHO-FPG	BMI 18.5-24.9	29924	10.49 (7.2, 15.27)	83.3	<0.001
	BMI 25.0-29.9	26314	6.56 (4.86, 8.86)	79.0	
	BMI ≥30.0	14025	4.36 (3.36, 5.68)	75.2	
ADA-FPG	BMI 18.5-24.9	29924	5.92 (4.23, 8.28)	85.0	0.049
	BMI 25.0-29.9	26314	4.71 (3.68, 6.04)	86.6	
	BMI ≥30.0	14025	3.51 (2.74, 4.49)	86.9	
2hPG	BMI 18.5-24.9	4485	5.71 (3.40, 9.60)	60.6	0.052
	BMI 25.0-29.9	5410	4.02 (3.13, 5.17)	51.7	
	BMI ≥30.0	2806	3.36 (2.62, 4.32)	55.4	
ADA-HbA1c	BMI 18.5-24.9	8433	13.36 (3.35, 53.35)	92.8	0.145
	BMI 25.0-29.9	6265	8.46 (4.07, 17.59)	90.7	
	BMI ≥30.0	4013	5.05 (4.23, 6.01)	0	
IEC-HbA1c	BMI 18.5-24.9	8433	12.51 (3.50, 44.74)	92.1	0.123
	BMI 25.0-29.9	6265	10.44 (4.78, 22.80)	92.2	
	BMI ≥30.0	4013	5.41 (4.55, 6.43)	0	

WHO = World Health Organization; FPG = fasting plasma glucose; ADA = American Diabetes Association; 2hPG = 2 hour post-load plasma glucose; HbA1c = glycated haemoglobin; IEC = International Expert Committee; Europe = Spain, Sweden; North America = Mexico, USA; CI = confidence intervals;

* Adjusted for age, sex, systolic blood pressure, smoking, and family history of diabetes

† Normal (i.e. non pre-diabetes or diabetes) was the reference group, see Table 1 for the respective definitions;

sTable 5: Pooled hazard ratios (HR) for incident diabetes^{†‡} associated with pre-diabetes status at baseline and Harrell's c-statistics for predicting 5 year risk of diabetes for studies which measured both FPG and 2hPG or FPG and HbA1c, respectively

Pre-diabetes definition	Multiple adjusted*			
	Hazard ratio (95% CI)	I ² (%)	c-statistics (95% CI)	I ² (%)
Based on studied that measured FPG and 2hPG (n=12,844)				
WHO-FPG[†]	3.61 (2.63, 4.97)	49.2	0.738 (0.718, 0.758)	0
ADA-FPG[†]	3.11 (2.35, 4.11)	83.1	0.757 (0.738, 0.776)	0
2hPG[†]	3.79 (3.12, 4.60)	66.8	0.792 (0.773, 0.811)	0
Based on studies that measured FPG and HbA1c (n=16,979)				
WHO-FPG[‡]	5.81 (4.18, 8.06)	81.4	0.766 (0.719, 0.813)	87.3
ADA-FPG[‡]	3.96 (2.82, 5.55)	87.8	0.770 (0.729, 0.812)	85.3
ADA-HbA1c[‡]	6.18 (4.16, 9.18)	89.4	0.785 (0.754, 0.816)	73.7
IEC-HbA1c[‡]	7.13 (4.77, 10.66)	88.2	0.774 (0.738, 0.811)	80.0

*Age, sex, body mass index (BMI), systolic blood pressure, smoking, and family history of diabetes;

[†] Normal (i.e. non pre-diabetes or diabetes) was the reference group, incident diabetes was self-report, use of anti-diabetic medication, FPG \geq 7.0 mmol/L (126 mg/dl), and/or 2hPG \geq 11.1 mmol/L (200 mg/dl);

[‡] Normal (I.e. non-pre-diabetes or diabetes) was the reference group, incident diabetes was self-report, use of anti-diabetic medication, FPG \geq 7.0 mmol/L (126 mg/dl), and/or HbA1c \geq 6.5% (48 mmol/mol);

WHO = World Health Organization; FPG = fasting plasma glucose; ADA = American Diabetes Association; 2hPG = 2 hour post-load plasma glucose; HbA1c = glycated haemoglobin; IEC = International Expert Committee;

sTable 6: Harrell's c-statistics for predicting 5 year risk of diabetes by sex

Pre-diabetes definition	Subgroup	Age adjusted			Multiple adjusted†			Heterogeneity between subgroup p-value
		n	c-statistics (95% CI)*	I ² (%)	n	c-statistics (95% CI)*	I ² (%)	
WHO-FPG	Men	35217	0.714 (0.680, 0.748)	76.7	34743	0.796 (0.780, 0.813)	30.7	0.354
	Women	38878	0.674 (0.643, 0.706)	65.2	38408	0.783 (0.762, 0.804)	49.9	
ADA-FPG	Men	35217	0.753 (0.724, 0.782)	75.7	34743	0.811 (0.792, 0.831)	57.5	0.465
	Women	38878	0.730 (0.700, 0.759)	69.0	38408	0.801 (0.781, 0.820)	45.7	
2hPG	Men	5930	0.771 (0.733, 0.809)	33.5	5586	0.819 (0.786, 0.853)	40.8	0.137
	Women	7606	0.724 (0.655, 0.793)	77.5	7260	0.784 (0.758, 0.809)	0	
ADA-HbA1c	Men	10592	0.768 (0.682, 0.855)	94.6	10300	0.818 (0.738, 0.898)	94.8	0.938
	Women	9383	0.741 (0.629, 0.853)	95.7	9075	0.822 (0.706, 0.938)	98.2	
IEC-HbA1c	Men	10592	0.739 (0.674, 0.804)	87.0	10300	0.809 (0.753, 0.864)	87.0	0.761
	Women	9383	0.715 (0.594, 0.836)	95.3	9075	0.823 (0.707, 0.938)	97.9	

WHO = World Health Organization; FPG = fasting plasma glucose; ADA = American Diabetes Association; 2hPG = 2 hour post-load plasma glucose; HbA1c = glycated haemoglobin; IEC = International Expert Committee; CI = confidence intervals;

* Normal (i.e. non pre-diabetes or diabetes) was the reference group, see Table 1 for the respective definitions;

† Adjusted for age, body mass index, systolic blood pressure, smoking, and family history of diabetes

sTable 7: Harrell's c-statistics for predicting 5 year risk of diabetes by age

Pre-diabetes definition	Subgroup	Sex adjusted			Multiple adjusted†			Heterogeneity between subgroup p-value
		n	c-statistics (95% CI)*	I ² (%)	n	c-statistics (95% CI)*	I ² (%)	
WHO-FPG	Age <50 years	34014	0.619 (0.560, 0.678)	95.0	33646	0.800 (0.783, 0.817)	17.0	0.731
	Age 50-59 years	23755	0.673 (0.632, 0.715)	80.9	23487	0.809 (0.736, 0.882)	98.3	
	Age ≥60 years	16225	0.680 (0.635, 0.726)	75.0	15912	0.790 (0.759, 0.821)	58.0	
ADA-FPG	Age <50 years	34014	0.699 (0.661, 0.737)	75.1	33651	0.819 (0.795, 0.842)	54.6	0.551
	Age 50-59 years	23755	0.742 (0.713, 0.772)	71.6	23487	0.833 (0.768, 0.899)	98.1	
	Age ≥60 years	16291	0.685 (0.605, 0.766)	96.8	15978	0.801 (0.770, 0.832)	66.9	
2hPG	Age <50 years	8075	0.711 (0.665, 0.757)	47.6	7777	0.798 (0.771, 0.825)	0	0.290
	Age 50-59 years	3172	0.710 (0.668, 0.751)	0	3007	0.793 (0.758, 0.827)	4.9	
	Age ≥60 years	2289	0.734 (0.674, 0.794)	38.8	2062	0.857 (0.727, 0.986)	96.0	
ADA-HbA1c	Age <50 years	10866	0.470 (0.644, 0.836)	91.4	10634	0.827 (0.722, 0.932)	95.7	0.398
	Age 50-59 years	5168	0.720 (0.637, 0.803)	90.8	5005	0.795 (0.741, 0.849)	79.2	
	Age ≥60 years	3941	0.732 (0.686, 0.778)	68.3	3736	0.793 (0.745, 0.841)	68.6	
IEC-HbA1c	Age <50 years	10866	0.664 (0.616, 0.713)	57.7	10634	0.805 (0.714, 0.897)	92.4	0.342
	Age 50-59 years	5168	0.699 (0.608, 0.791)	89.9	5005	0.794 (0.769, 0.819)	2.1	
	Age ≥60 years	3941	0.693 (0.614, 0.772)	84.6	3736	0.779 (0.749, 0.809)	14.4	

WHO = World Health Organization; FPG = fasting plasma glucose; ADA = American Diabetes Association; 2hPG = 2 hour post-load plasma glucose; HbA1c = glycated haemoglobin; IEC = International Expert Committee; CI = confidence intervals;

* Normal (i.e. non pre-diabetes or diabetes) was the reference group, see Table 1 for the respective definitions;

† Adjusted for sex, body mass index, systolic blood pressure, smoking, and family history of diabetes

sTable 8: Harrell's c-statistics for predicting 5 year risk of diabetes by country/geographical region

Pre-diabetes definition	Subgroup	Age and sex adjusted			Multiple adjusted†			Heterogeneity between subgroup p-value
		n	c-statistics	I ²	n	c-statistics	I ²	
			(95% CI)*	(%)		(95% CI)*	(%)	
WHO-FPG	Australia	27920	0.701 (0.655, 0.747)	51.9	27368	0.786 (0.762, 0.809)	0	0.949
	Europe	4735	0.639 (0.561, 0.717)	0	4683	0.801 (0.721, 0.880)	42.7	
	Iran	4407	0.739 (0.712, 0.766)	-	4289	0.763 (0.736, 0.789)	-	
	Japan	9739	0.782 (0.734, 0.830)	78.7	9739	0.820 (0.761, 0.879)	85.4	
	North America	27294	0.662 (0.624, 0.701)	78.7	27072	0.782 (0.755, 0.810)	74.6	
ADA-FPG	Australia	27920	0.724 (0.692, 0.756)	26.4	27368	0.786 (0.762, 0.809)	0	0.709
	Europe	4735	0.752 (0.684, 0.821)	1.9	4683	0.845 (0.792, 0.899)	0	
	Iran	4407	0.776 (0.750, 0.803)	-	4289	0.797 (0.771, 0.822)	-	
	Japan	9739	0.799 (0.752, 0.846)	75.4	9739	0.825 (0.771, 0.879)	84.7	
	North America	27294	0.708 (0.661, 0.754)	88.5	27072	0.798 (0.777, 0.819)	61.7	
2hPG	Australia	6297	0.725(0.686, 0.764)	-	5763	0.788 (0.755, 0.821)	-	0.906
	Iran	4061	0.776 (0.749, 0.804)	-	3956	0.797 (0.769, 0.825)	-	
	Mexico	1644	0.687 (0.629, 0.746)	-	1644	0.790 (0.747, 0.833)	-	
	Spain	1534	0.702 (0.565, 0.839)	-	1483	0.800 (0.697, 0.904)	-	
ADA-HbA1c	Australia	10281	0.709 (0.685, 0.733)	0	9720	0.783 (0.761, 0.805)	0	0.529
	Japan	6481	0.905 (0.879, 0.931)	-	6481	0.935 (0.920, 0.950)	-	
	USA	3213	0.730 (0.701, 0.759)	-	3174	0.770 (0.744, 0.796)	-	
IEC-HbA1c	Australia	10281	0.660 (0.587, 0.734)	85.7	9720	0.770 (0.730, 0.810)	66.1	0.401
	Japan	6481	0.855 (0.822, 0.887)	-	6481	0.911 (0.891, 0.932)	-	

USA	3213	0.727 (0.692, 0.762)	-	3174	0.782 (0.753, 0.811)	-
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WHO = World Health Organization; FPG = fasting plasma glucose; ADA = American Diabetes Association; 2hPG = 2 hour post-load plasma glucose; HbA1c = glycated haemoglobin; IEC = International Expert Committee; Europe = Spain, Sweden; North America = Mexico, USA; CI = confidence intervals;

* Normal (i.e. non pre-diabetes or diabetes) was the reference group, see Table 1 for the respective definitions;

† Adjusted for age, sex, body mass index, systolic blood pressure, smoking, and family history of diabetes

sTable 9: Harrell's c-statistics for predicting 5 year risk of diabetes by body mass index (BMI) defined obesity status

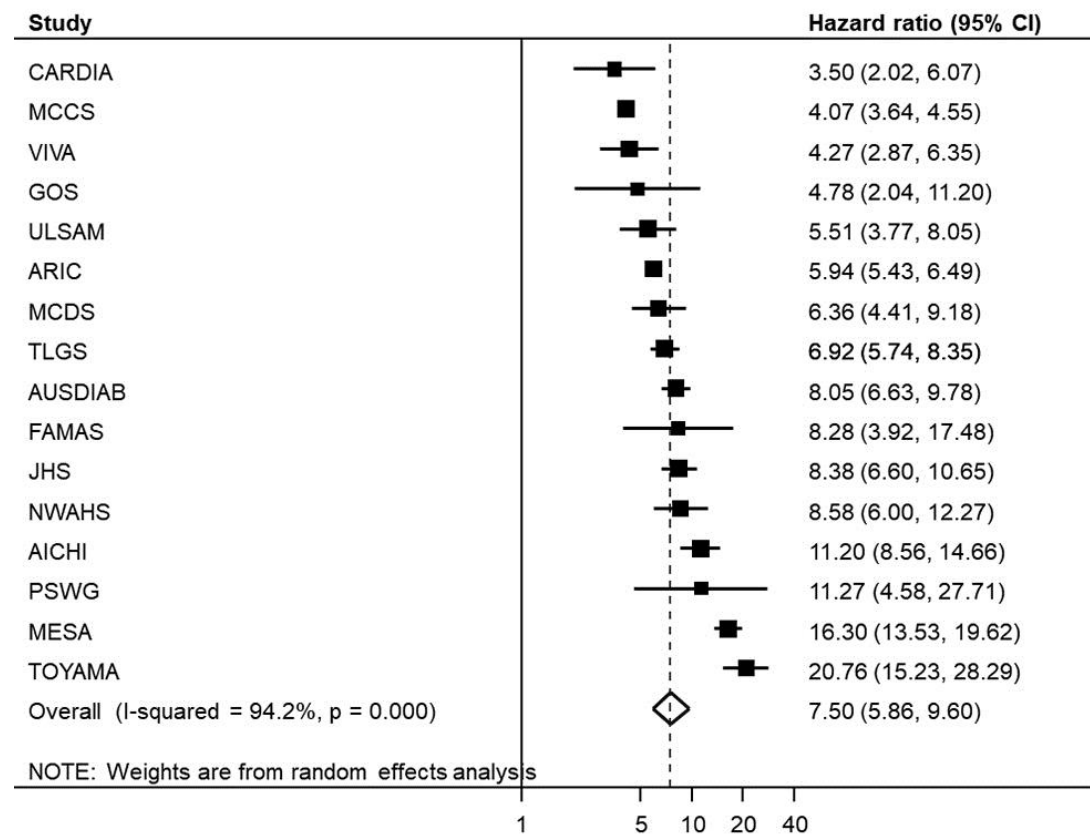
Pre-diabetes definition	Subgroup	Age and sex adjusted			Multiple adjusted†			Heterogeneity between subgroup p-value
		n	c-statistics	I ²	n	c-statistics	I ²	
			(95% CI)*	(%)		(95% CI)*	(%)	
WHO-FPG	BMI 18.5-24.9	30247	0.749 (0.710, 0.788)	57.5	29924	0.795 (0.759, 0.831)	56.5	0.033
	BMI 25.0-29.9	26709	0.713 (0.695, 0.730)	0	26314	0.770 (0.728, 0.812)	85.6	
	BMI ≥30.0	14236	0.681 (0.655, 0.707)	43.9	14025	0.734 (0.698, 0.771)	77.1	
ADA-FPG	BMI 18.5-24.9	30247	0.774 (0.736, 0.811)	59.8	29924	0.808 (0.775, 0.841)	54.2	0.058
	BMI 25.0-29.9	26709	0.739 (0.724, 0.754)	0	26314	0.795 (0.761, 0.828)	80.0	
	BMI ≥30.0	14236	0.702 (0.671, 0.734)	65.2	14025	0.755 (0.701, 0.809)	93.1	
2hPG	BMI 18.5-24.9	4735	0.823 (0.650, 0.997)	97.1	4485	0.785 (0.737, 0.833)	0	0.123
	BMI 25.0-29.9	5693	0.746 (0.713, 0.778)	0	5410	0.785 (0.755, 0.816)	0	
	BMI ≥30.0	2957	0.721 (0.688, 0.753)	0	2806	0.747 (0.705, 0.789)	38.4	
ADA-HbA1c	BMI 18.5-24.9	8648	0.767 (0.592, 0.942)	95.5	8433	0.804 (0.664, 0.944)	93.5	0.076
	BMI 25.0-29.9	6510	0.745 (0.701, 0.788)	45.1	6265	0.778 (0.747, 0.809)	5.9	
	BMI ≥30.0	4150	0.708 (0.678, 0.739)	32.0	4013	0.735 (0.712, 0.757)	0	
IEC-HbA1c	BMI 18.5-24.9	8648	0.748 (0.570, 0.926)	95.5	8433	0.790 (0.659, 0.922)	92.0	0.092
	BMI 25.0-29.9	6510	0.713 (0.640, 0.787)	79.2	6265	0.765 (0.722, 0.807)	43.4	
	BMI ≥30.0	4150	0.677 (0.635, 0.719)	52.0	4013	0.720 (0.676, 0.764)	61.5	

WHO = World Health Organization; FPG = fasting plasma glucose; ADA = American Diabetes Association; 2hPG = 2 hour post-load plasma glucose; HbA1c = glycated haemoglobin; IEC = International Expert Committee; CI = confidence intervals;

* Normal (i.e. non pre-diabetes or diabetes) was the reference group, see Table 1 for the respective definitions;

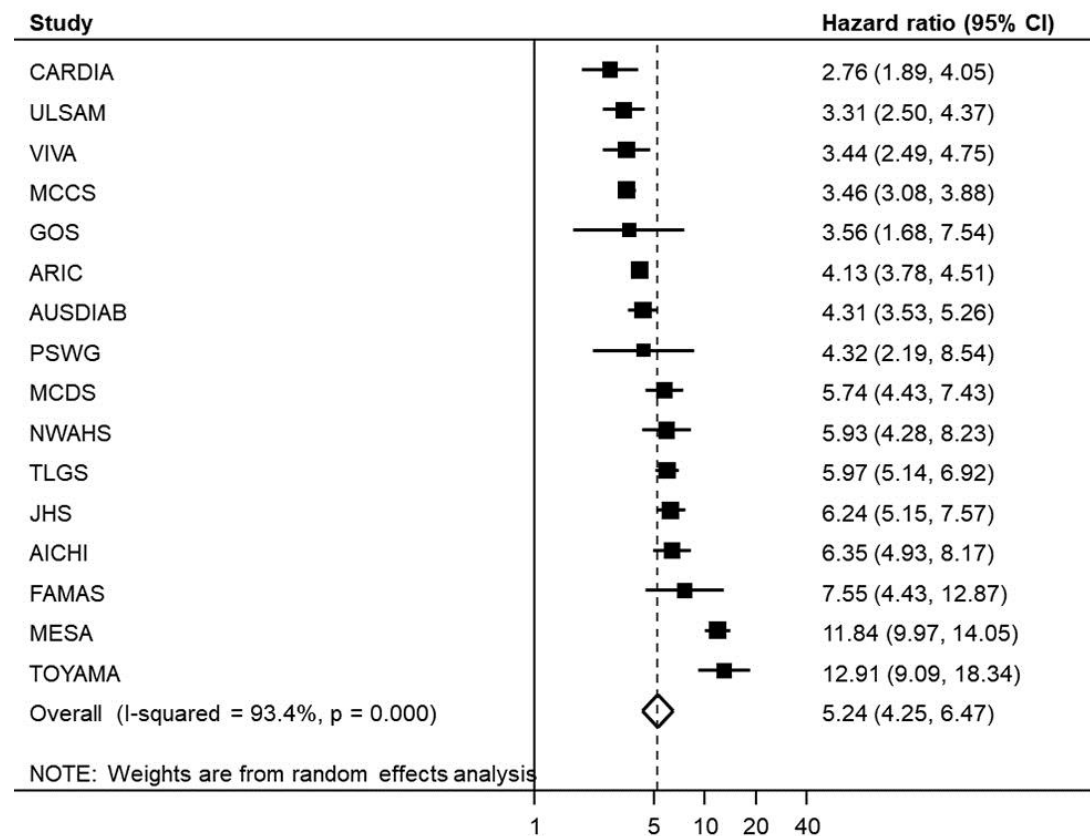
† Adjusted for age, sex, systolic blood pressure, smoking, and family history of diabetes

sFigure 1: Age- and sex-adjusted pooled hazard ratios (HR) for incident diabetes association with World Health Organization-fasting plasma glucose defined pre-diabetes status (fasting plasma glucose 6.1–6.9 mmol/L (110–124 mg/dl) at baseline



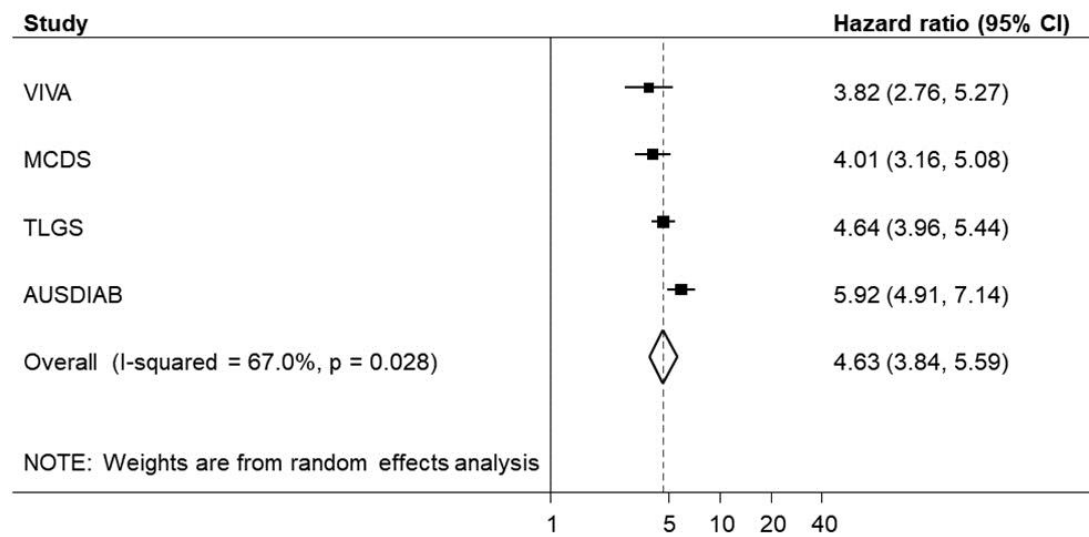
Normal fasting plasma glucose (fasting plasma glucose <6.1 mmol/L (110 mg/dl)) was the reference group;

sFigure 2: Age- and sex-adjusted pooled hazard ratios (HR) for incident diabetes association with American Diabetes Association-fasting plasma glucose defined pre-diabetes status (fasting plasma glucose 5.6–6.9 mmol/L (101–124 mg/dl) at baseline



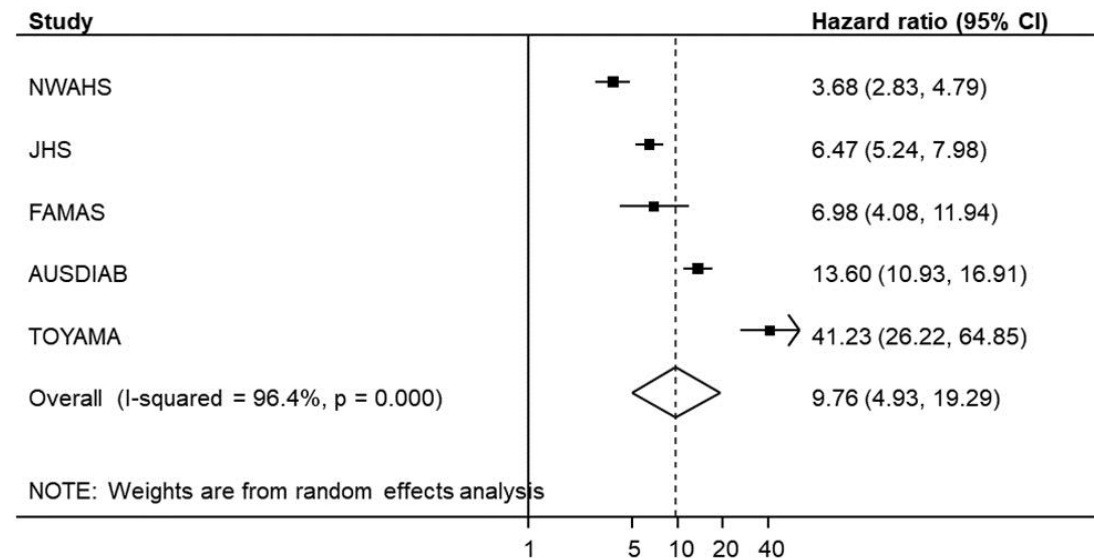
Normal fasting plasma glucose (fasting plasma glucose <5.6 mmol/L (101 mg/dl)) was the reference group;

sFigure 3: Age- and sex-adjusted pooled hazard ratios (HR) for incident diabetes association with 2 hour postload plasma glucose defined pre-diabetes status (2 hour plasma glucose 7.8–11.0 mmol/L (141–198 mg/dl) at baseline



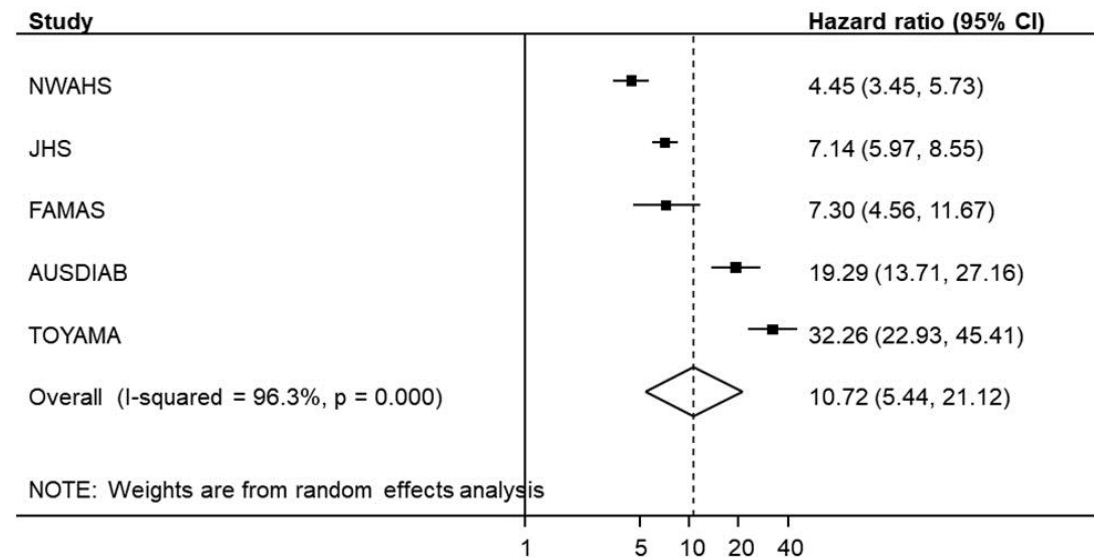
Normal 2 hour plasma glucose (2 hour plasma glucose <7.8 mmol/L (141 mg/dl)) was the reference group;

sFigure 4: Age- and sex-adjusted pooled hazard ratios (HR) for incident diabetes association with American Diabetes Association-HbA1c defined pre-diabetes status (HbA1c 5.7–6.4% (39–47 mmol/mol)) at baseline



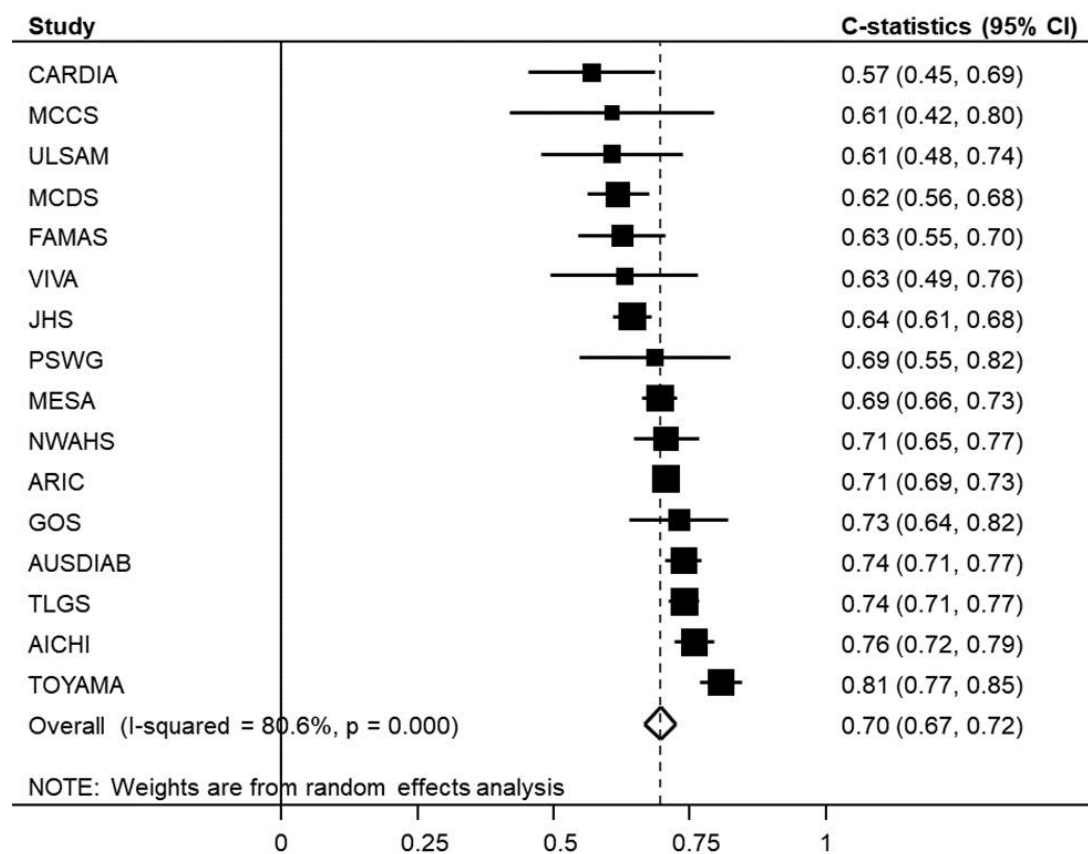
Normal HbA1c (HbA1c <5.7% (39 mmol/mol)) was the reference group;

sFigure 5: Age- and sex-adjusted pooled hazard ratios (HR) for incident diabetes association with International Expert Committee-HbA1c defined pre-diabetes status (HbA1c 6.0–6.4% (42–47 mmol/mol)) at baseline



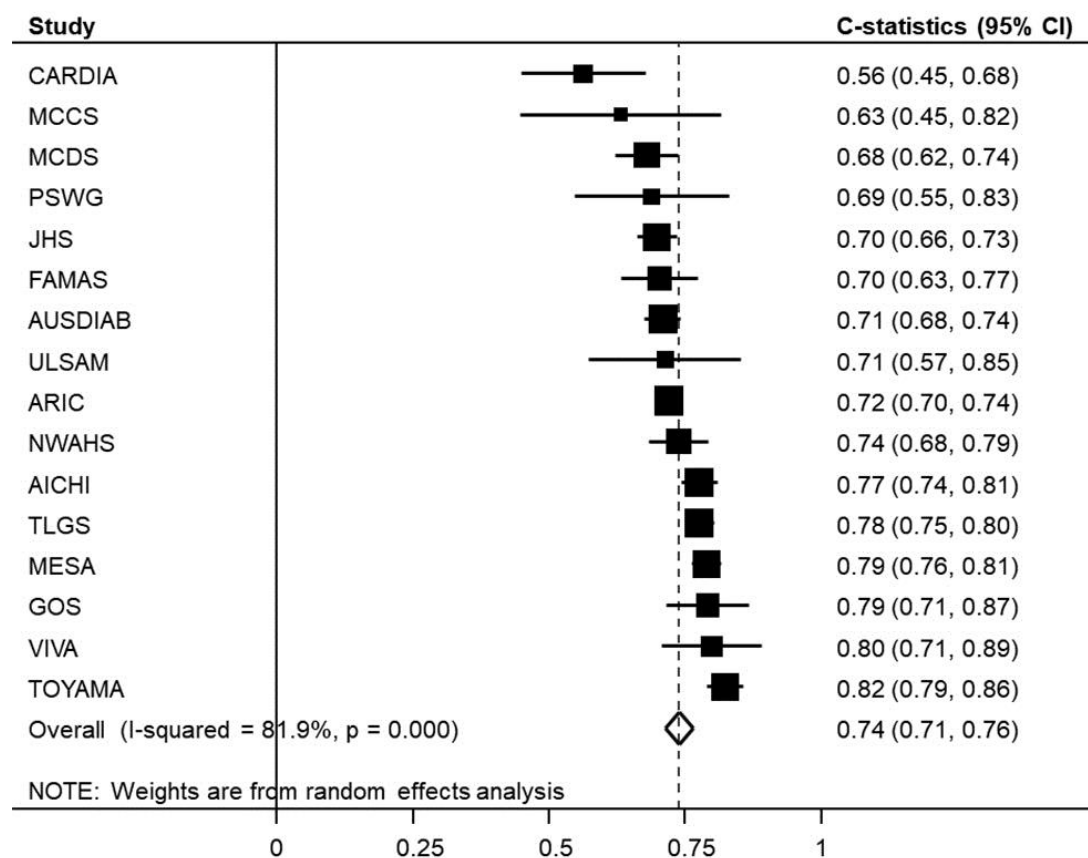
Normal HbA1c (HbA1c < 6.0% (42 mmol/mol)) was the reference group;

sFigure 6: Age- and sex-adjusted Harrell's c-statistics for predicting 5 year risk of diabetes associated with World Health Organization-fasting plasma glucose defined pre-diabetes status (fasting plasma glucose 6.1–6.9 mmol/L (110–124 mg/dl) at baseline



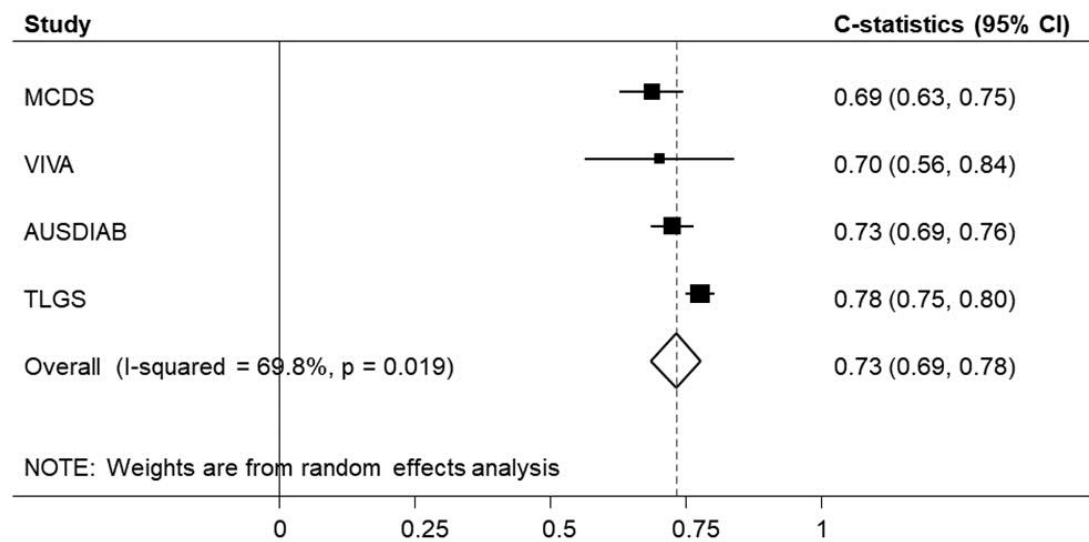
Normal fasting glucose (fasting plasma glucose <6.1 mmol/L (110 mg/dl)) was the reference group;

sFigure 7: Age- and sex-adjusted Harrell's c-statistics for predicting 5 year risk of diabetes associated with American Diabetes Association-fasting plasma glucose defined pre-diabetes status (fasting plasma glucose 5.6–6.9 mmol/L (101–124 mg/dl) at baseline



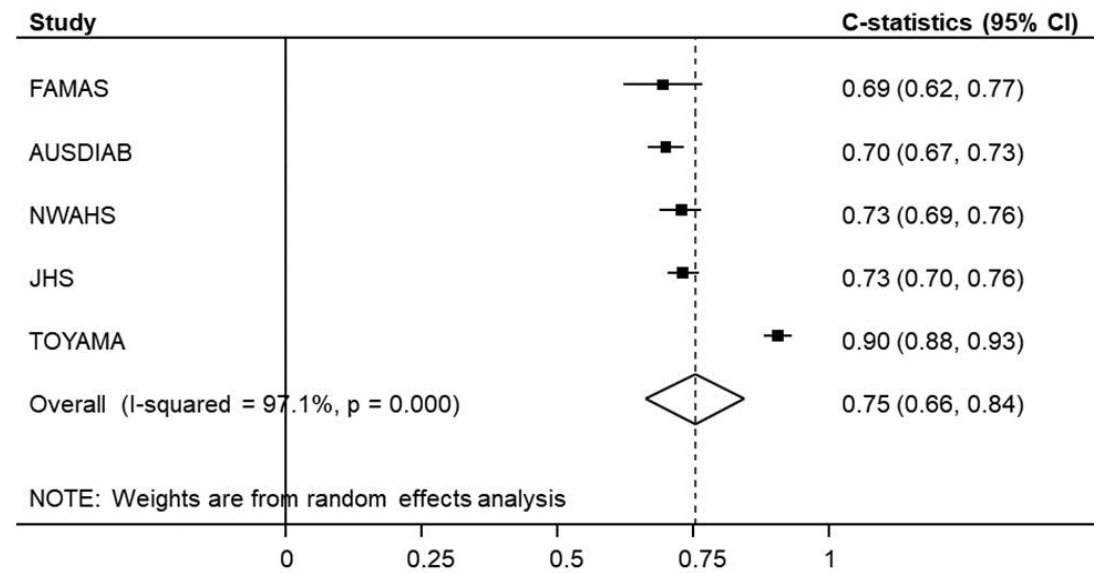
Normal fasting plasma glucose (fasting plasma glucose <5.6 mmol/L (101 mg/dl)) was the reference group;

sFigure 8: Age- and sex-adjusted Harrell's c-statistics for predicting 5 year risk of diabetes associated with 2 hour postload plasma glucose defined pre-diabetes status (2 hour plasma glucose 7.8–11.0 mmol/L (141–198 mg/dl) at baseline



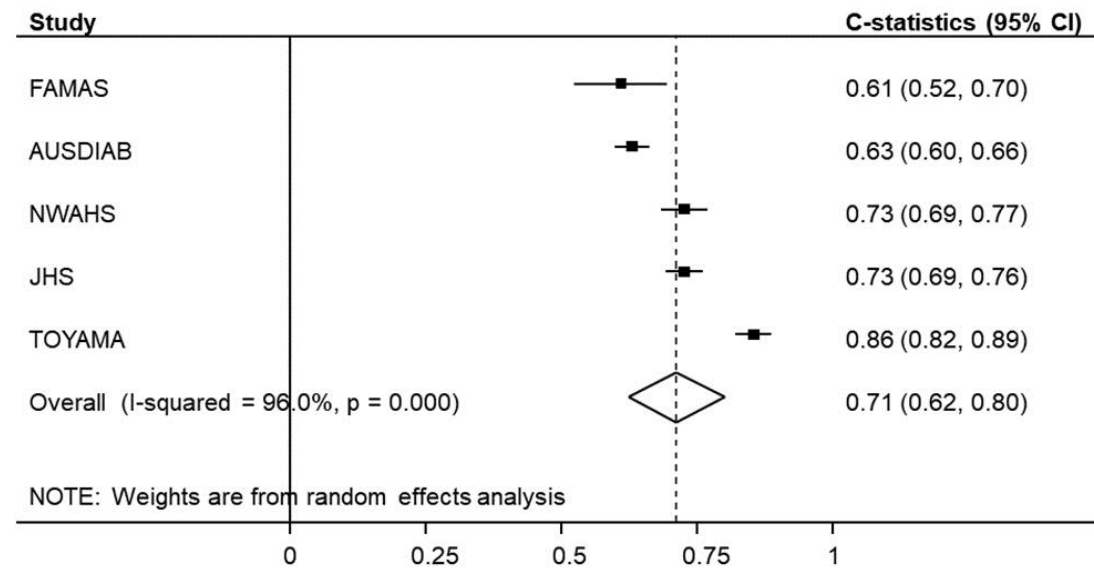
Normal 2 hour plasma glucose (2 hour plasma glucose <7.8 mmol/L (141 mg/dl)) was the reference group;

sFigure 9: Age- and sex-adjusted Harrell's c-statistics for predicting 5 year risk of diabetes associated with American Diabetes Association-HbA1c defined pre-diabetes status (HbA1c 5.7–6.4% (39–47 mmol/mol)) at baseline



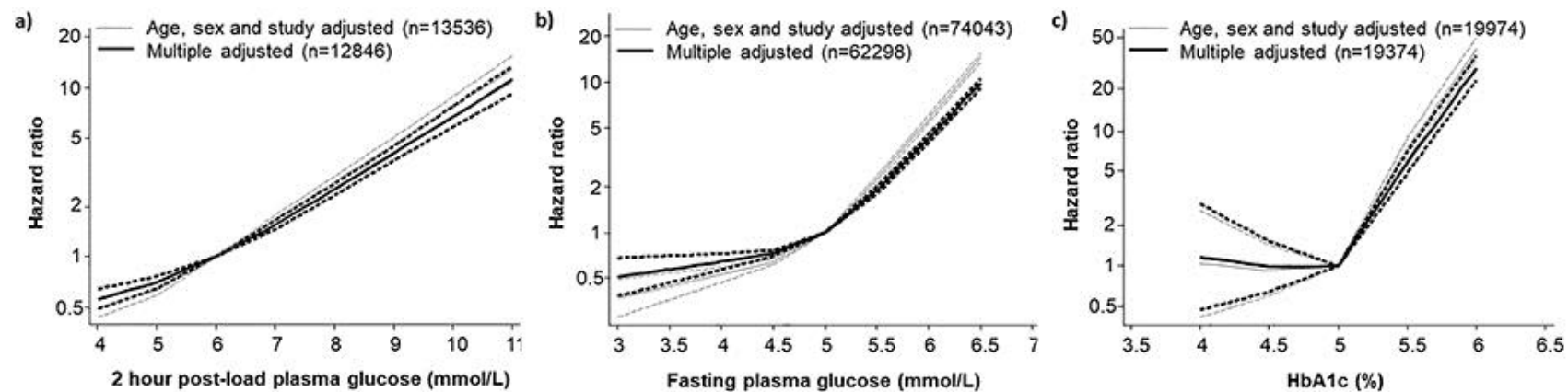
Normal HbA1c (HbA1c <5.7% (39 mmol/mol)) was the reference group;

sFigure 10: Age- and sex-adjusted Harrell's c-statistics for predicting 5 year risk of diabetes associated with International Expert Committee-HbA1c defined pre-diabetes status ((HbA1c 6.0–6.4% (42–47 mmol/mol)) at baseline



Normal HbA1c (HbA1c < 6.0% (42 mmol/mol)) was the reference group;

sFigure 11: Relationships between each of three measures of glycaemia and incident diabetes



a) Knots at fasting plasma glucose (FPG) 4.2, 4.9, 5.4, and 6.2 mmol/L (76, 88, 97, 112 mg/dl) and reference at 5.0 mmol/L (90 mg/dl); b) knots at 2 hour post-load plasma glucose (2hPG) 3.4, 5.1, 6.2, and 8.9 mmol/L (61, 92, 112, 160 mg/dl) and reference at 6.0 mmol/L (108 mg/dl); c) knots at HbA1c 4.7, 5.1, 5.4, and 6.0% and reference at 5.0%;

Multiple adjusted = adjusted for age, sex, study, body mass index, systolic blood pressure, smoking, and family history of diabetes;