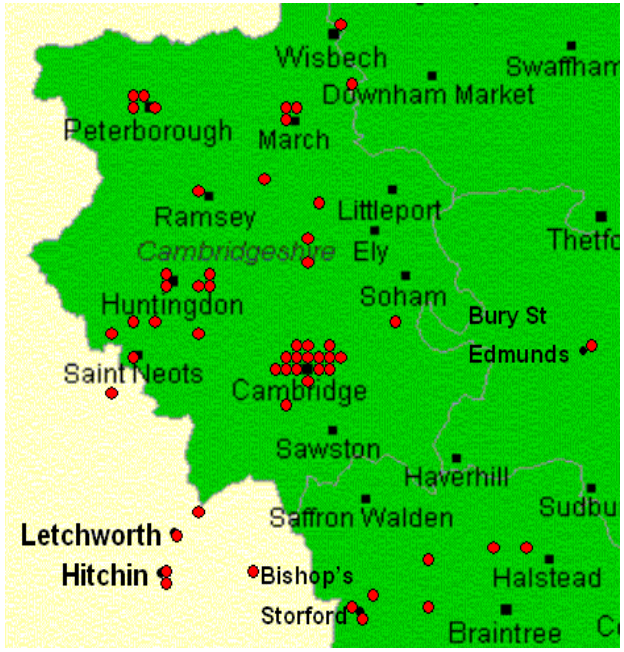
MRC | Epidemiology Unit

ADDITION-Cambridge

Five year results



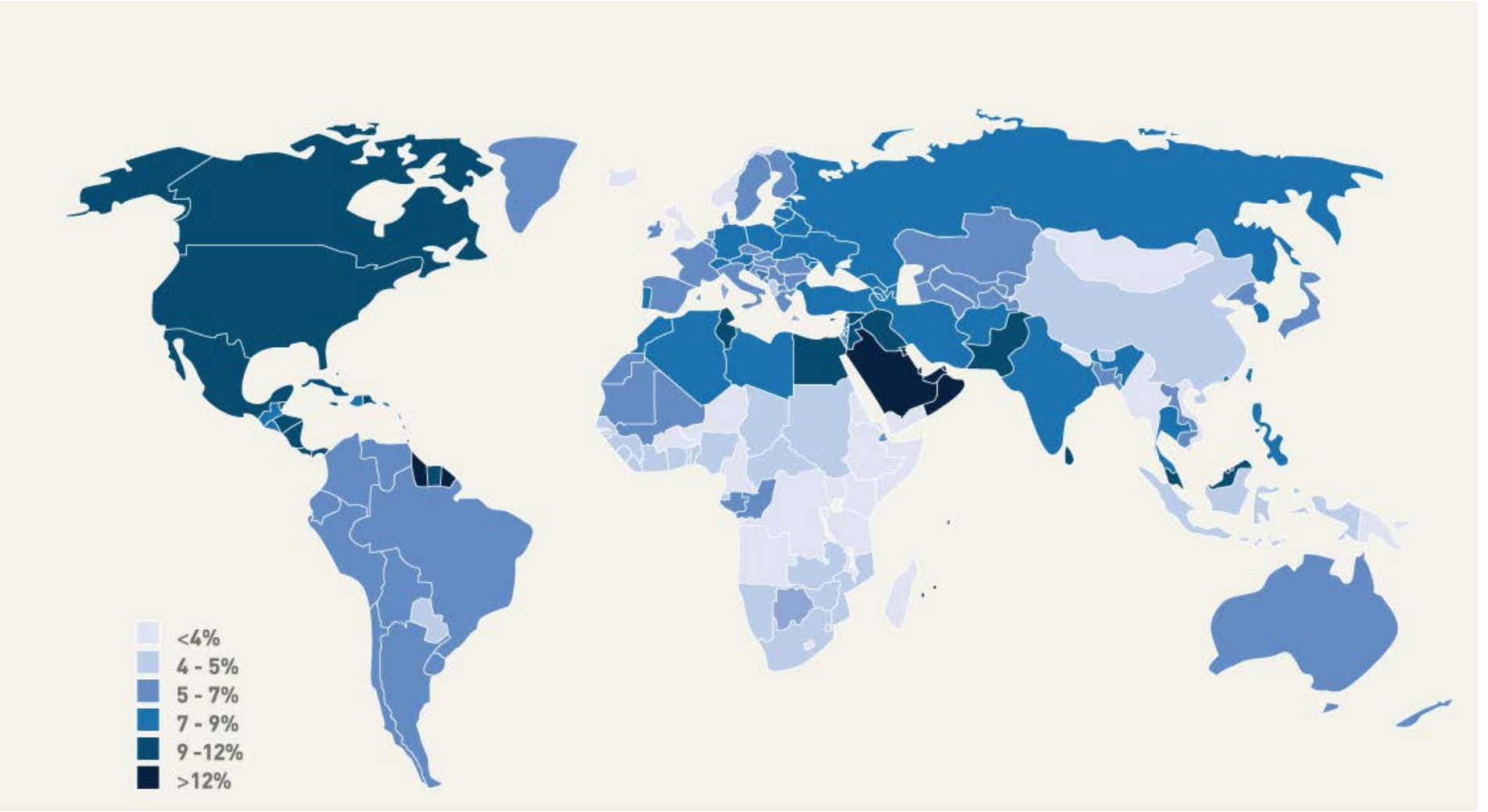
Simon Griffin
Nick Wareham

Outline

1. The diabetes epidemic
2. Why screen for diabetes?
3. *ADDITION-Cambridge*
4. Study results
5. Conclusions
6. Ten-year follow-up

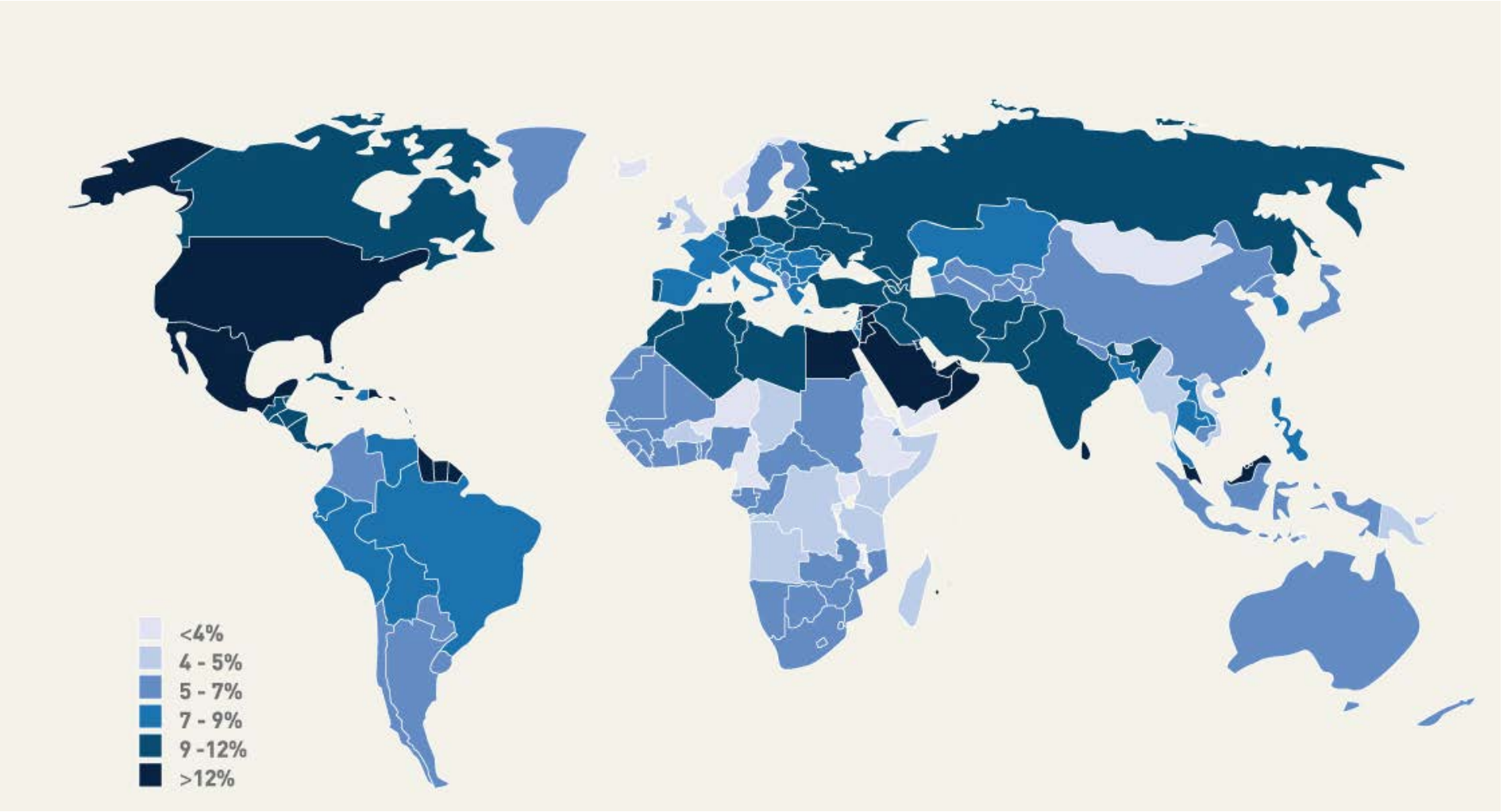
1. The diabetes epidemic

Prevalence (%) estimates of diabetes (20-79 years), 2010



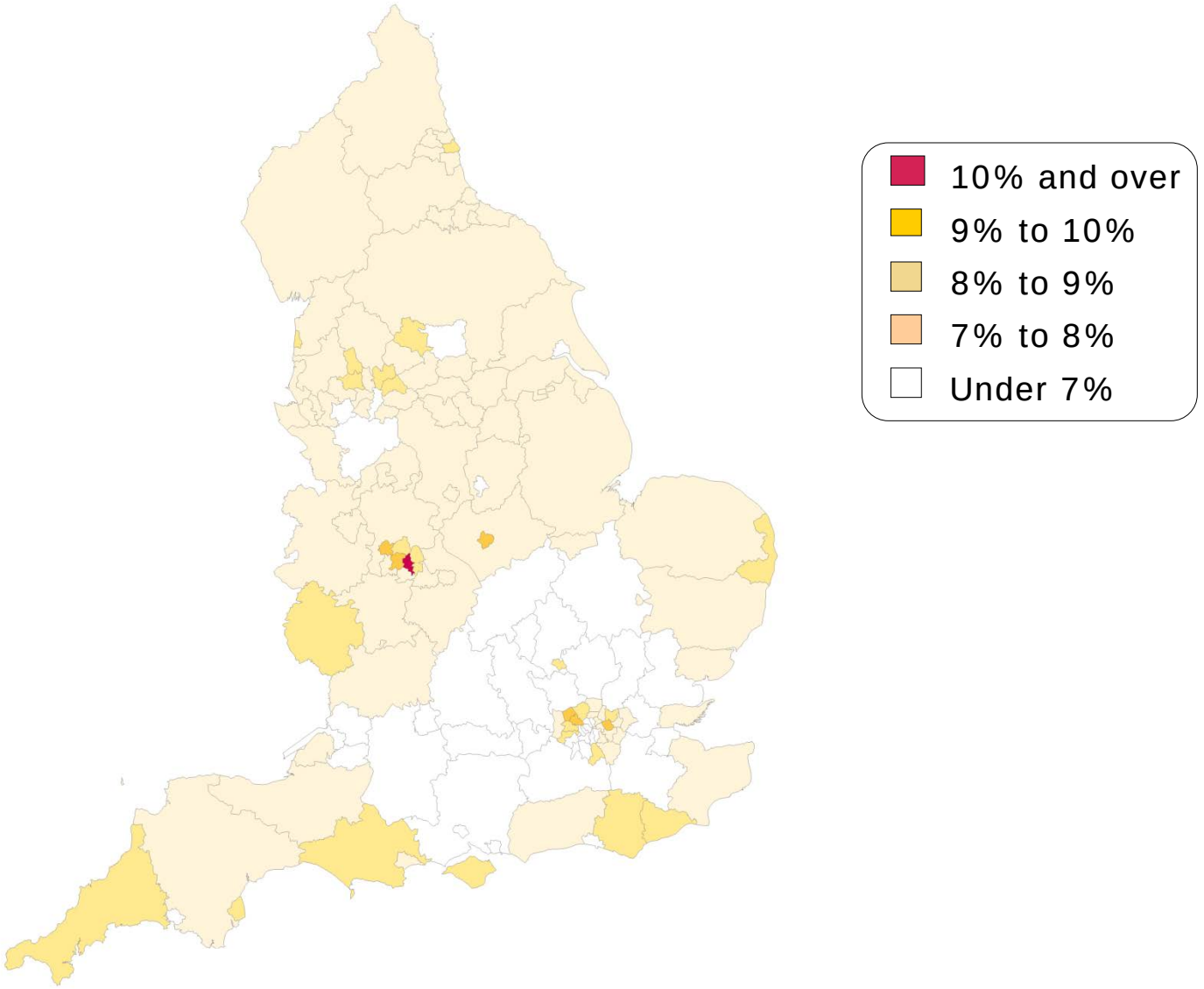
IDF Diabetes Atlas 2009

Prevalence (%) estimates of diabetes (20-79 years), 2030



IDF Diabetes Atlas 2009

England, 2010



Holman *et al*. Diab Med 2011;**28**:575-82

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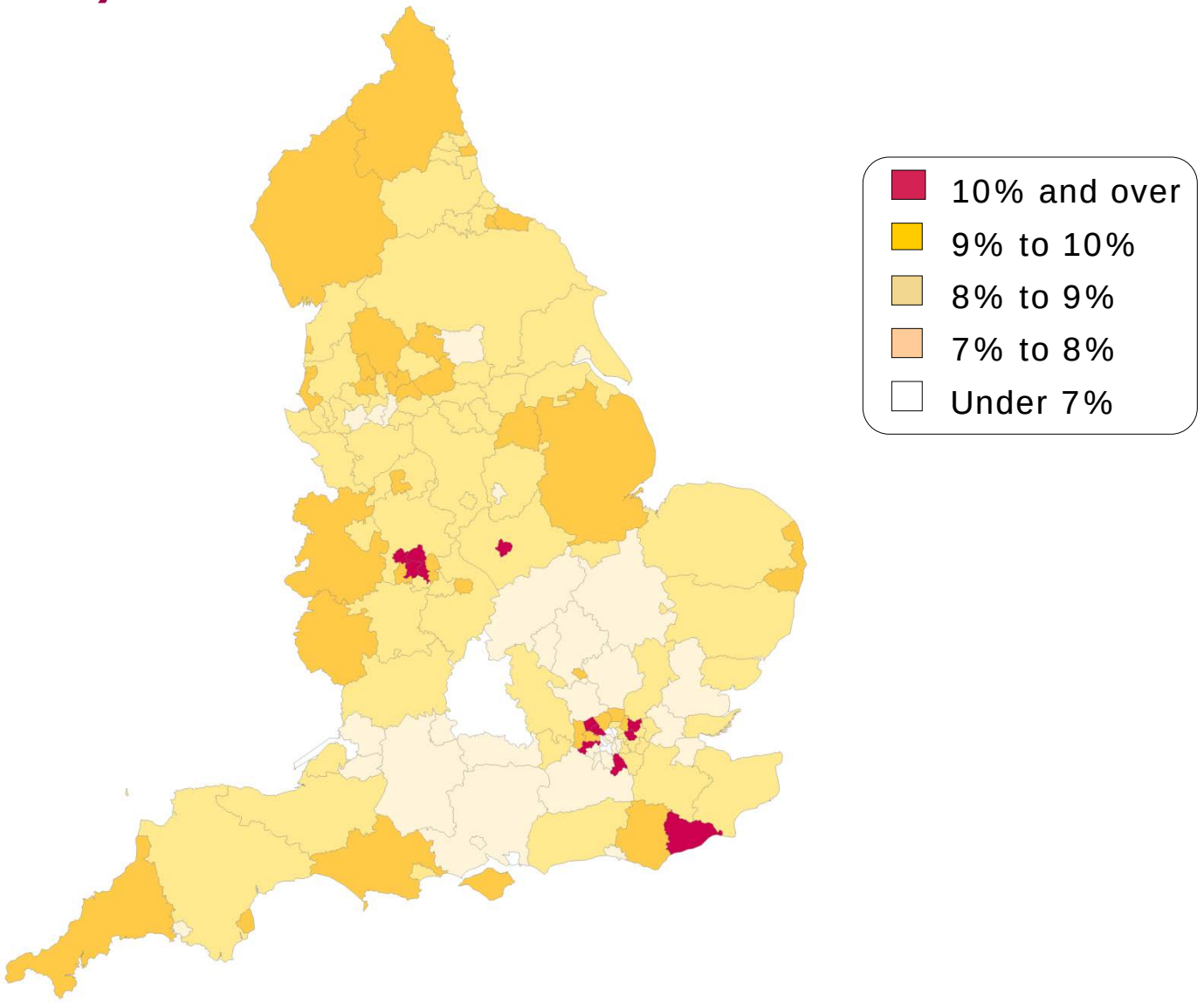
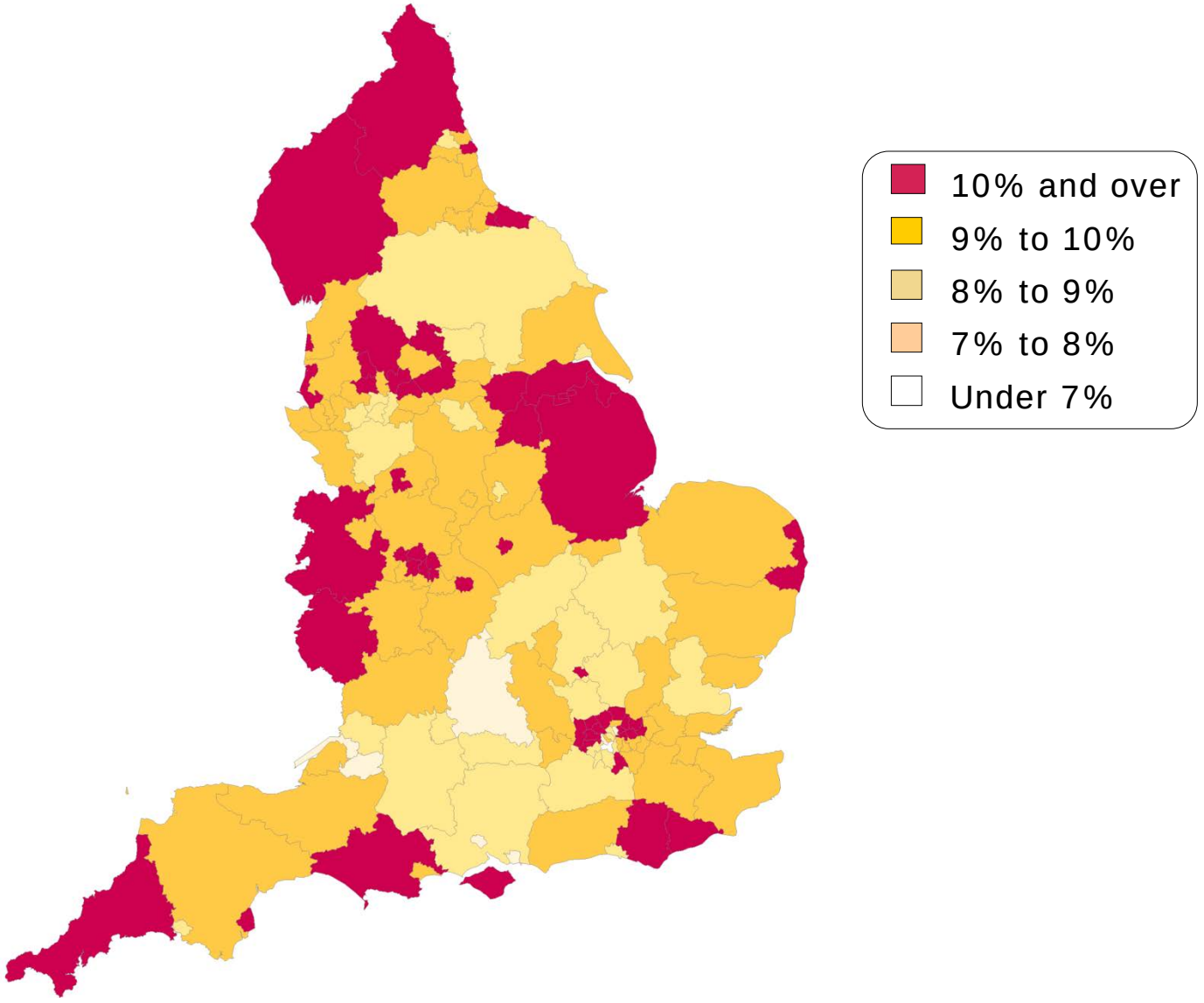
England, 2020



Holman *et al*. Diab Med 2011;**28**:575-82

England, 2030



Holman *et al*. Diab Med 2011;**28**:575-82

- Prevention
- Screening
- Better treatment

International Diabetes Federation

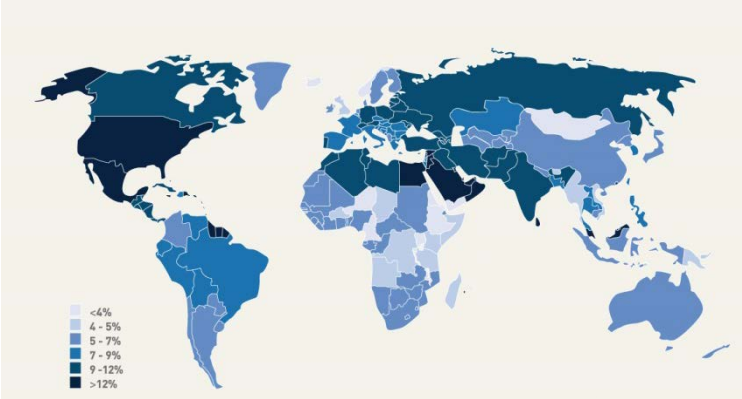
Global Diabetes Plan, IDF 2011

2. Why screen for diabetes?

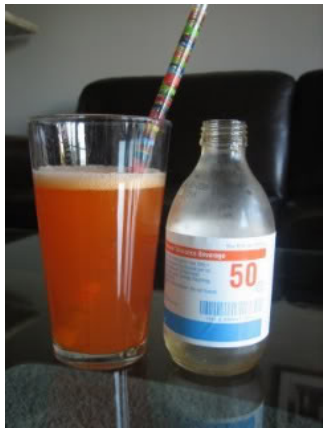
Screening criteria

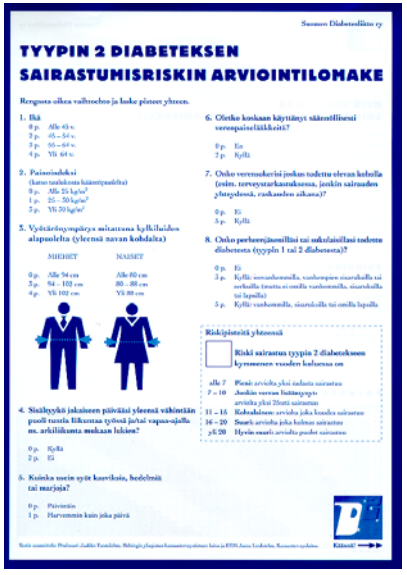
1. Important health problem
2. Simple and safe test available
3. Potential harms investigated
4. Effective treatment for individuals identified early

1. Important health problem



2. Simple and safe test available





TYYPIN 2 DIABETEKSEN
SAIRASTUMISRISKIN ARVIOINTILOMAKE

Diabetes Risk Test

Diabetes Risk Test

Please select your age category:
18-44 45-64 65 or older

Please enter your height:
feet inches — or — centimeters

Please enter your weight:
pounds — or — kilograms

I am under 65 years of age AND I get little or no exercise.
True False

I have a sister or brother with diabetes.
True False

I have a parent with diabetes.
True False

I am a woman who has had a baby weighing more than nine pounds (4,100 grams) at birth.
True False

Calculate score Reset form

Complete the questionnaire below to find out if you are at risk of developing type 2 diabetes.

	Answer	Tick appropriate box	Score
1. How old are you?	44 & under	☐	0
	45-49	☐	7
	50-54	☐	13
	55+	☐	18
2. What sex are you?	Male	☐	4
	Female	☐	0
3. What is your Body Mass Index (BMI)?	24 & under	☐	0
	25-29	☐	7
	30+	☐	15

Use your height and weight to work out your Body Mass Index (BMI) using the graph below: e.g. 4 ft10 ins 11 stone = obese class 1, i.e. BMI is over 30 therefore score 15.

	Answer	Tick appropriate box	Score
4. Have you been diagnosed with high blood pressure?			
	Yes	☐	10
	No	☐	0
5. Are you physically active in your leisure life? *e.g. 30 minutes of moderate physical activity, such as brisk walking, at least 5 days a week*			
	Yes	☐	0
	No	☐	6
6. Are either of your parents diabetic?			
	Yes	☐	7
	No	☐	0
		TOTAL (max 60)	

SCORE RANGES
If you have a total score of 31 or more you may be at increased risk of having undiagnosed diabetes. Please consider following the advice below and overleaf to arrange a simple blood sugar test at a local pharmacy, or discuss the result with your practice nurse.

Identify diabetes early

Diabetes causes elevated levels of sugar in the blood and may run in families. Untreated diabetes may cause damage to the heart, eyes, kidneys and feet. Early diagnosis and treatment can reduce the risk of complications.

Some of the signs of diabetes include always feeling tired, being irritable, being thirsty, passing urine excessively and getting infections and numbness in the feet.

See overleaf

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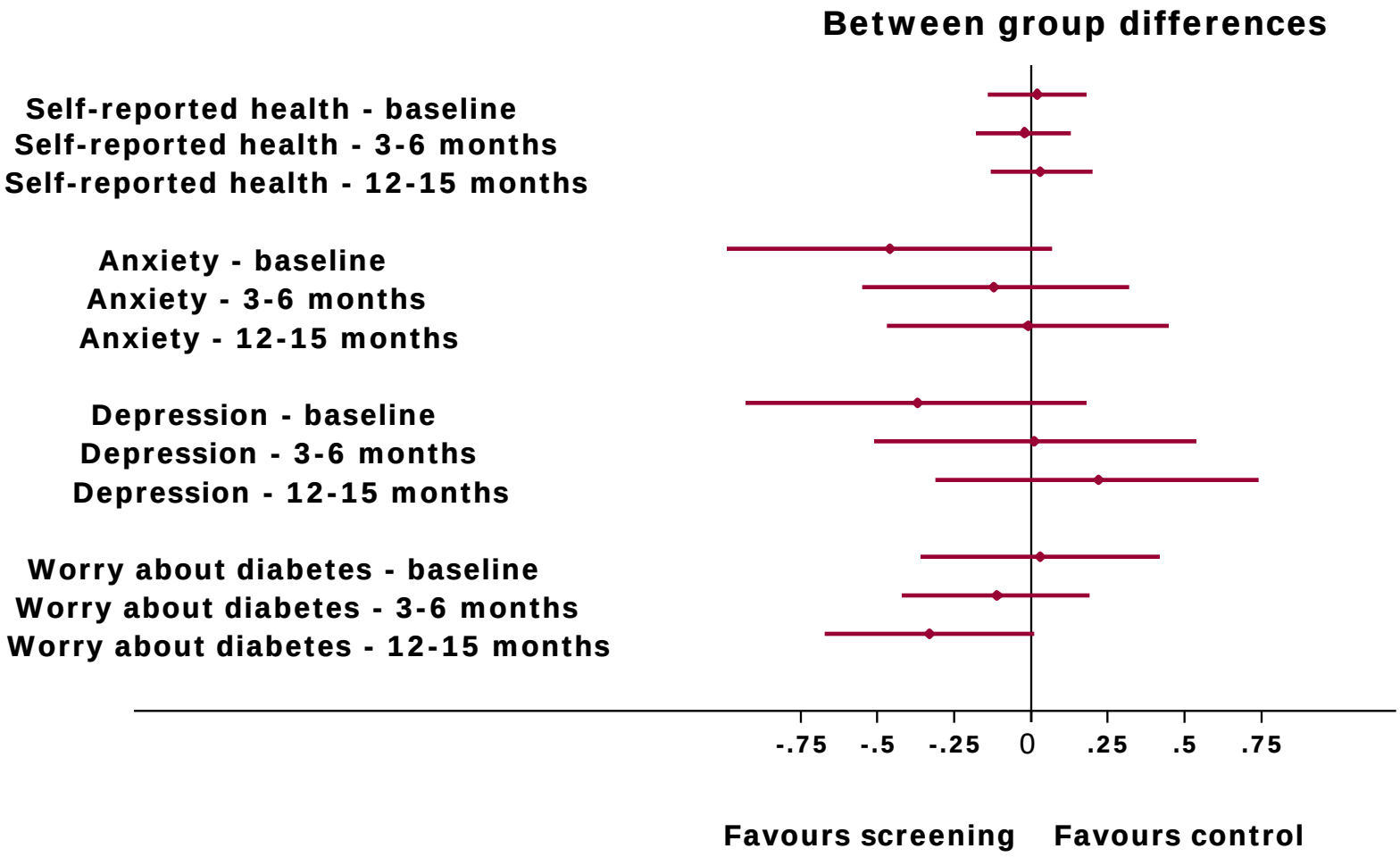
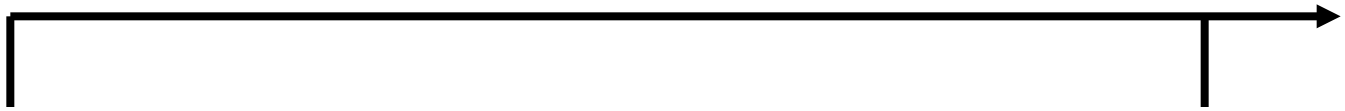
3. Potential harms



BMJ 2007;**335**:486-489
BMJ 2007;**335**:490-493

4. Effective treatment for individuals detected early

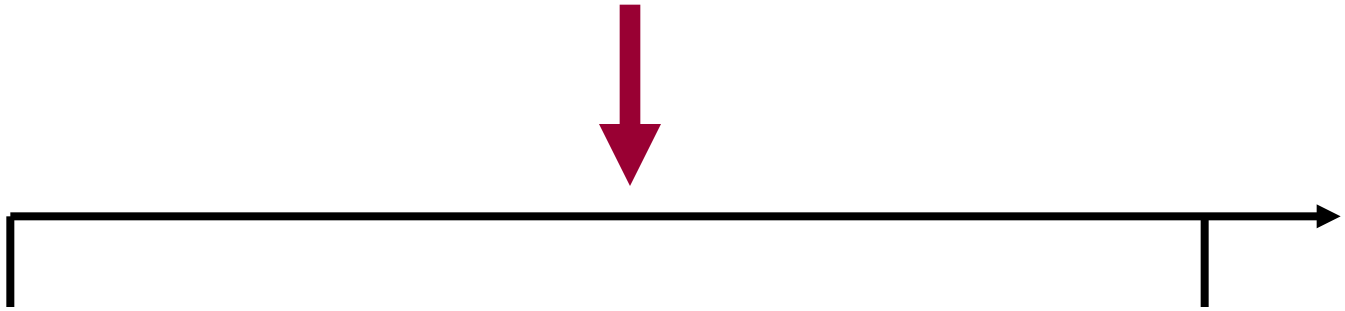


Diabetes detectable in the blood

0 years

Diabetes detected clinically

~8 years



Diabetes detectable in the blood

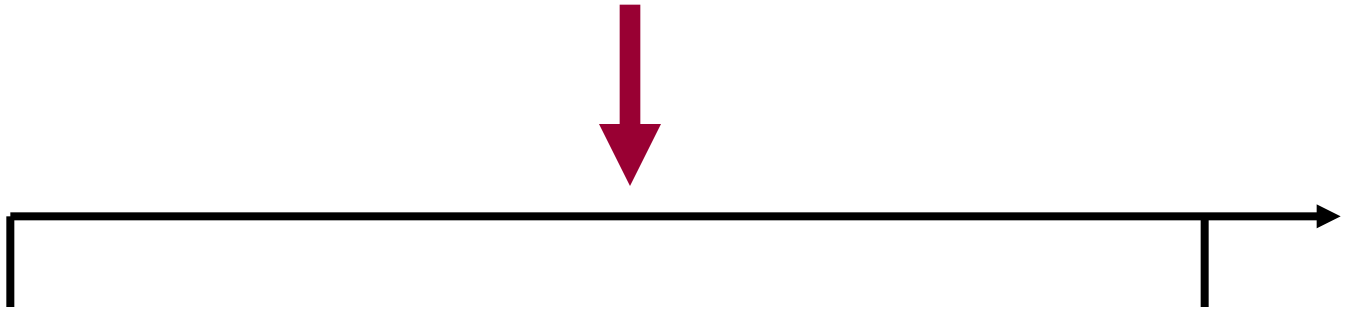
Diabetes detected by screening

Diabetes detected clinically

0 years

~4 years

~8 years



Diabetes detectable in the blood

Diabetes detected by screening

Diabetes detected clinically

0 years

~4 years

~8 years

If we find and treat people earlier, can we reduce the chance of them dying early and/or suffering from heart attacks and strokes?

Mortality by Attendance at Screening in the Ely cohort 1990-1999

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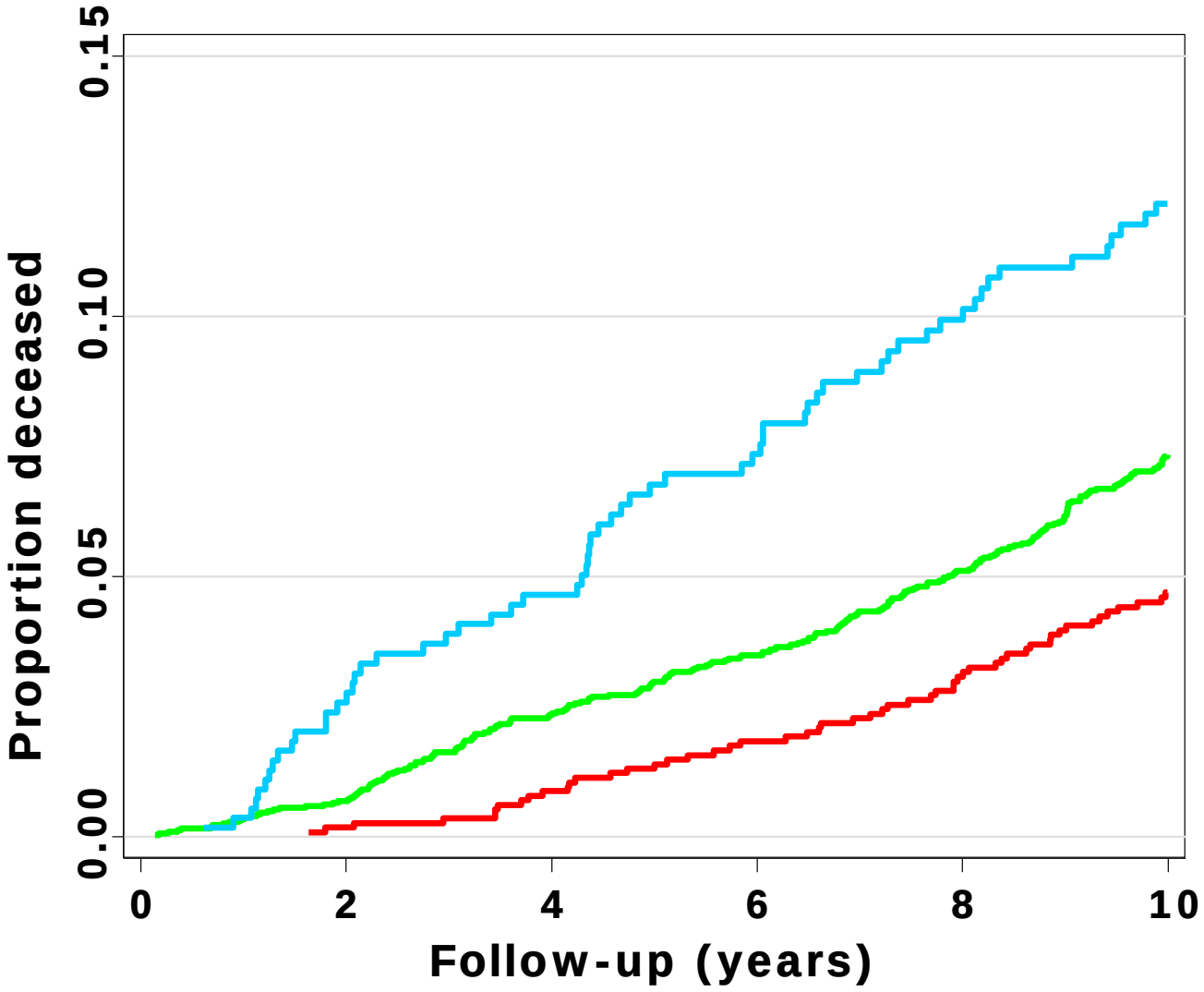


Invited but did not attend - 36% increased mortality

Not invited

Invited and attended - 46% decreased mortality

MRC | Medical Research Council

Diabetologia 2010;54:312-319

MRC | Epidemiology Unit

3. *ADDITION-Cambridge*

MRC | Medical Research Council

Aims

- To evaluate the feasibility of stepwise screening programs to identify individuals with undiagnosed diabetes

- To assess the feasibility of the delivery of intensive treatment of risk factors in people with screen detected diabetes

- To evaluate the effectiveness in primary care of early *intensive treatment* compared to *routine care* on cardiovascular outcomes

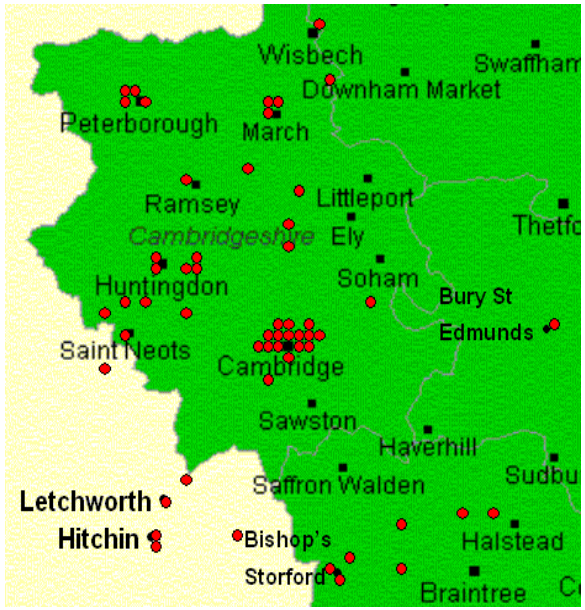
55 practices in the Eastern Region

28 practices screening and intensive target driven management of risk factors

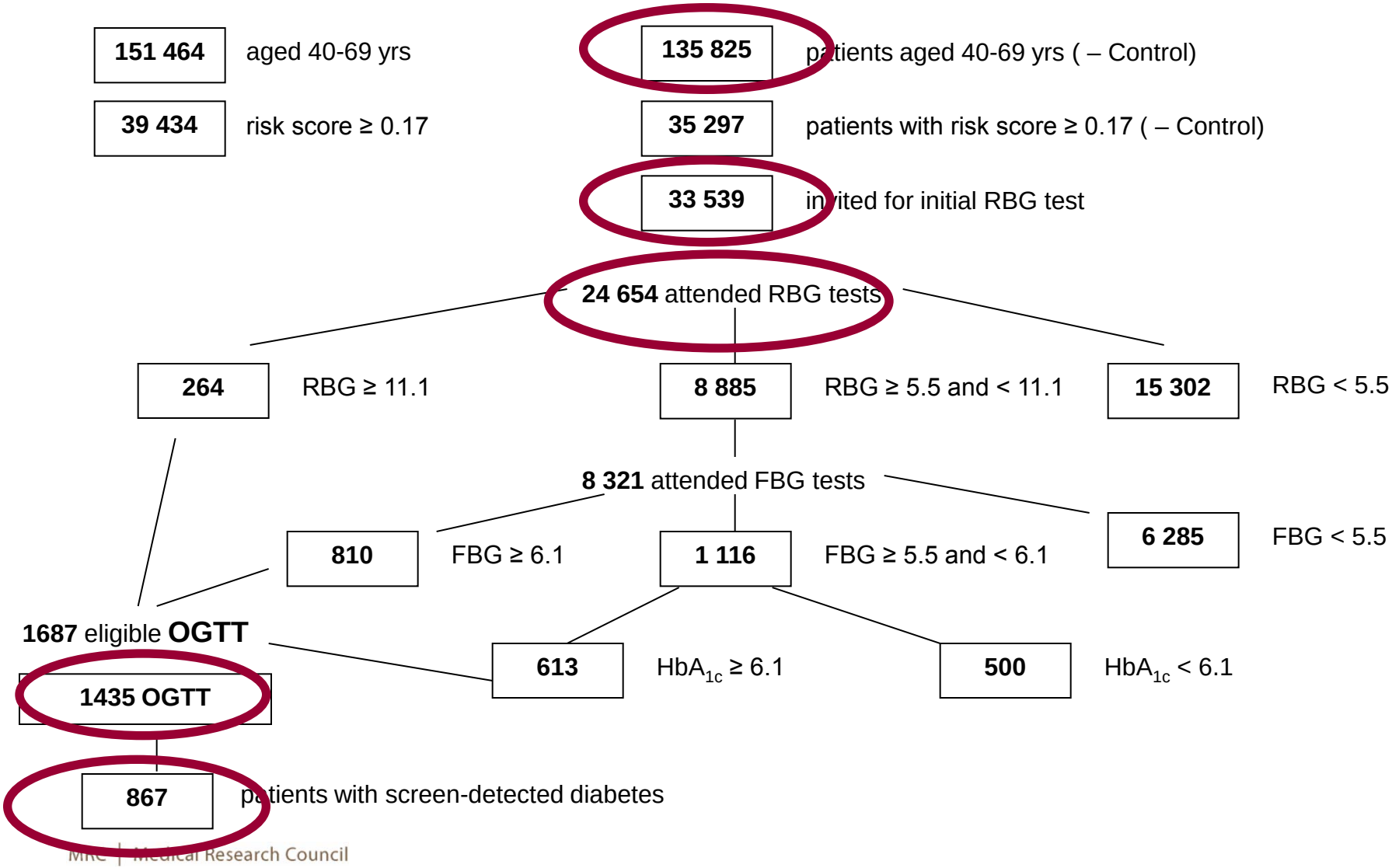
27 practices screening and routine care

1 year — **Assessment of CVD risk among screen-detected diabetic patients**

5 years — **Assessment of CVD events and mortality among screen-detected diabetic patients**



Screening programme



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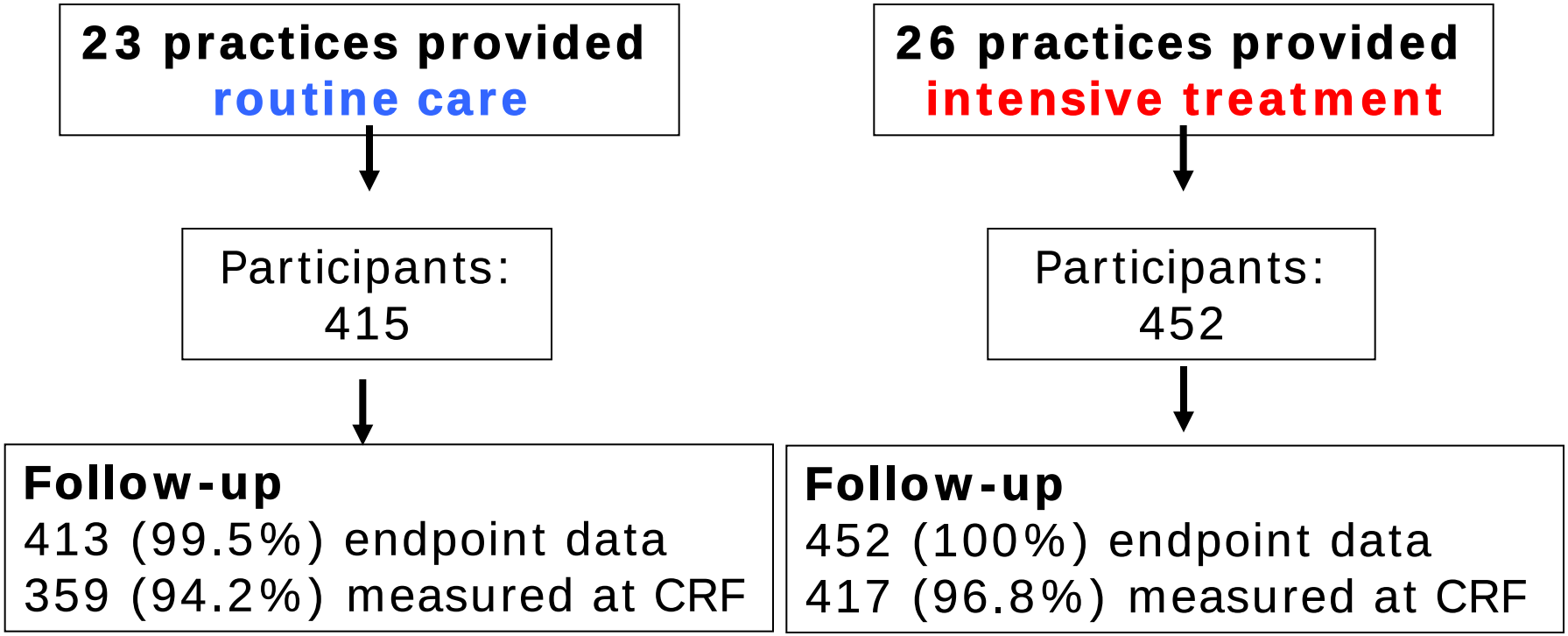
Intervention

4. Study results

Patient baseline characteristics

	Average
Age (years)	60
Current smoker (%)	28
HbA_{1c} (%)	6.8
BMI ($kg/m^{2)}$	33.6
Systolic blood pressure (mmHg)	142
Diastolic blood pressure (mmHg)	81
Cholesterol (mmol/l)	5.4

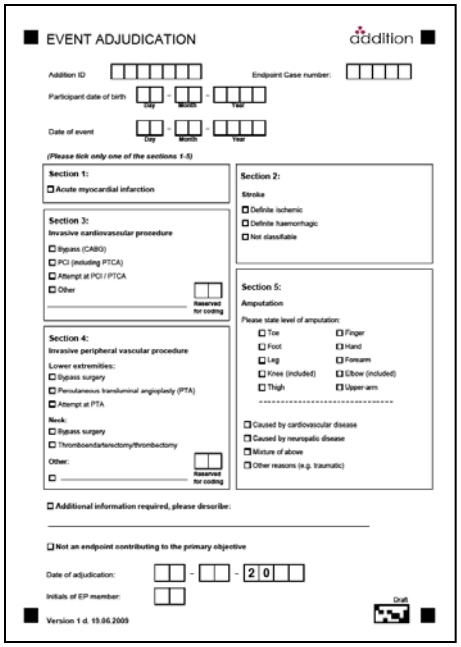
Five-year data collection



Study coordination

More than 1,100 phone calls!!

Collecting endpoints



EVENT ADJUDICATION

addition

Addition ID

Endpoint Case number:

Participant date of birth: Day - Month - Year

Date of event: Day - Month - Year

(Please tick only one of the sections 1-5)

Section 1:
- Acute myocardial infarction

Section 2:
Stroke
- Definite ischemic
- Definite haemorrhagic
- Not classifiable

Section 3:
Invasive cardiovascular procedure
- Bypass (CABG)
- PCI (including PTCA)
- Attempt at PCI / PTCA
- Other

Reserved for coding

Section 4:
Invasive peripheral vascular procedure

Lower extremities:
- Bypass surgery
- Percutaneous transluminal angioplasty (PTA)
- Attempt at PTA

Neck:
- Bypass surgery
- Thromboendarterectomy/thrombectomy

Other:

Reserved for coding

Section 5:
Amputation

Please state level of amputation:
- Toe
- Finger
- Foot
- Hand
- Leg
- Forearm
- Knee (included)
- Elbow (included)
- Thigh
- Upper-arm

- Caused by cardiovascular disease
- Caused by neuropatic disease
- Mixture of above
- Other reasons (e.g. traumatic)

- Additional information required, please describe:

- Not an endpoint contributing to the primary objective

Date of adjudication: - - 20

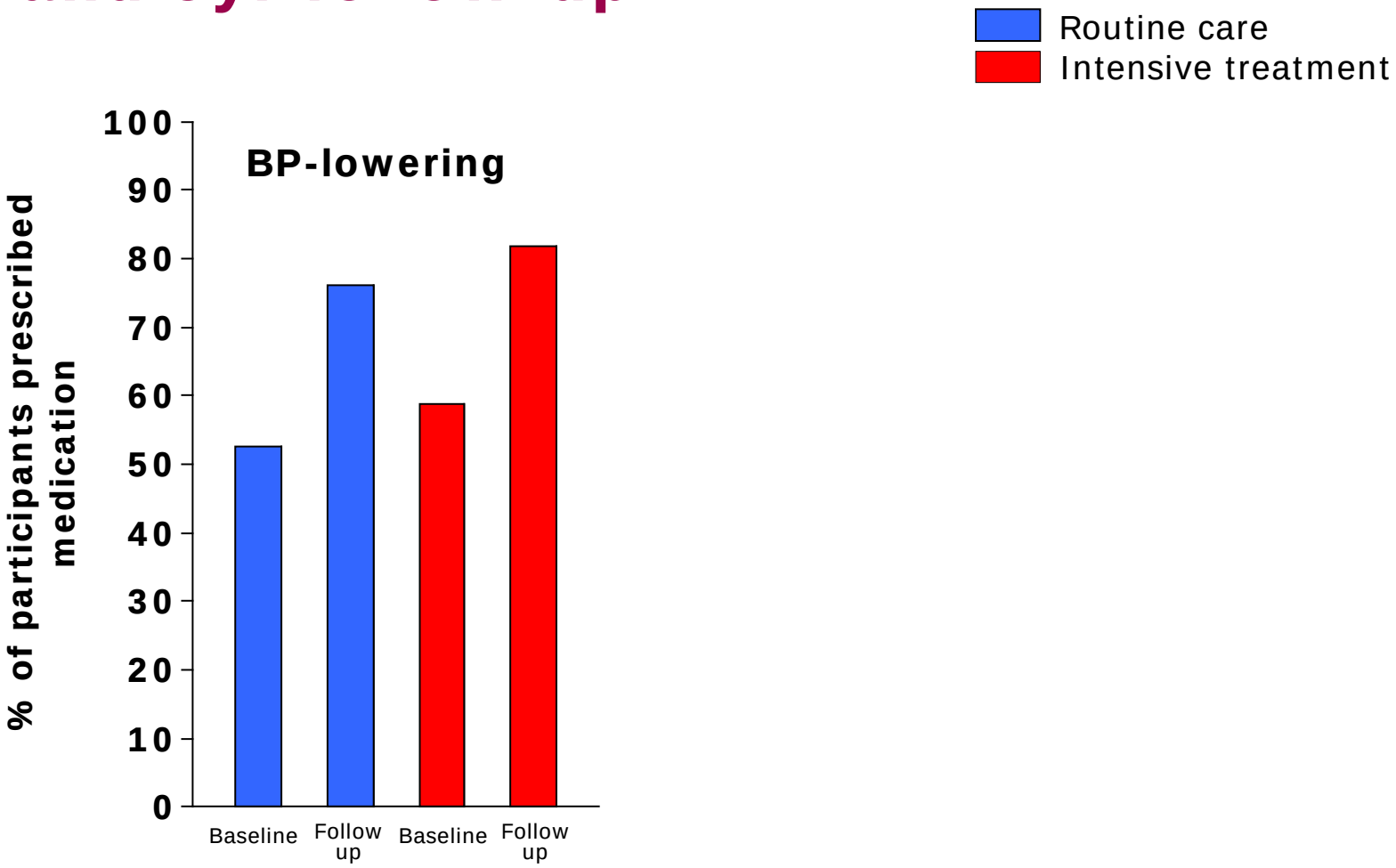
Initials of EP member:

Draft

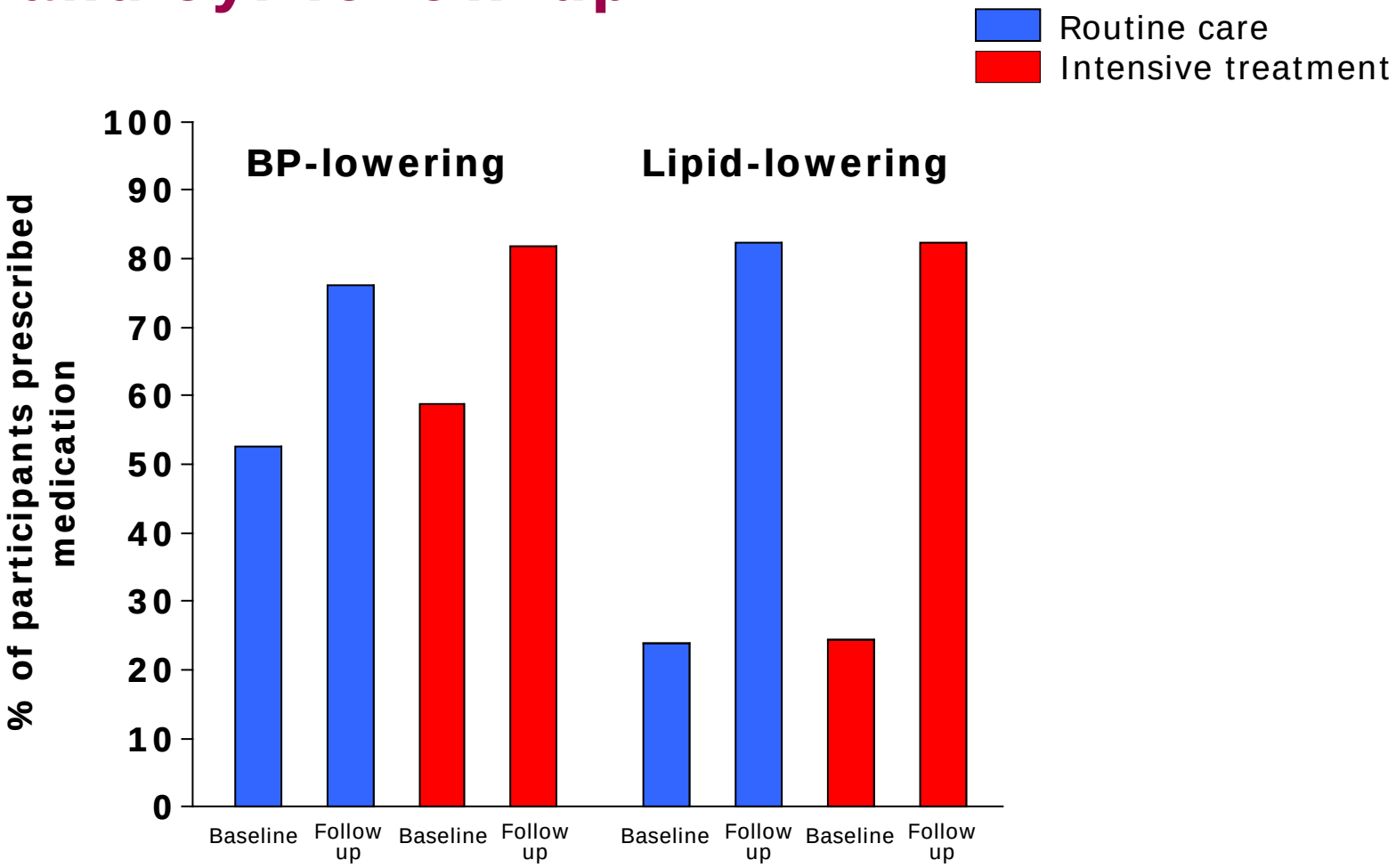
Version 1 d. 19.06.2009

Sorting through questionnaires

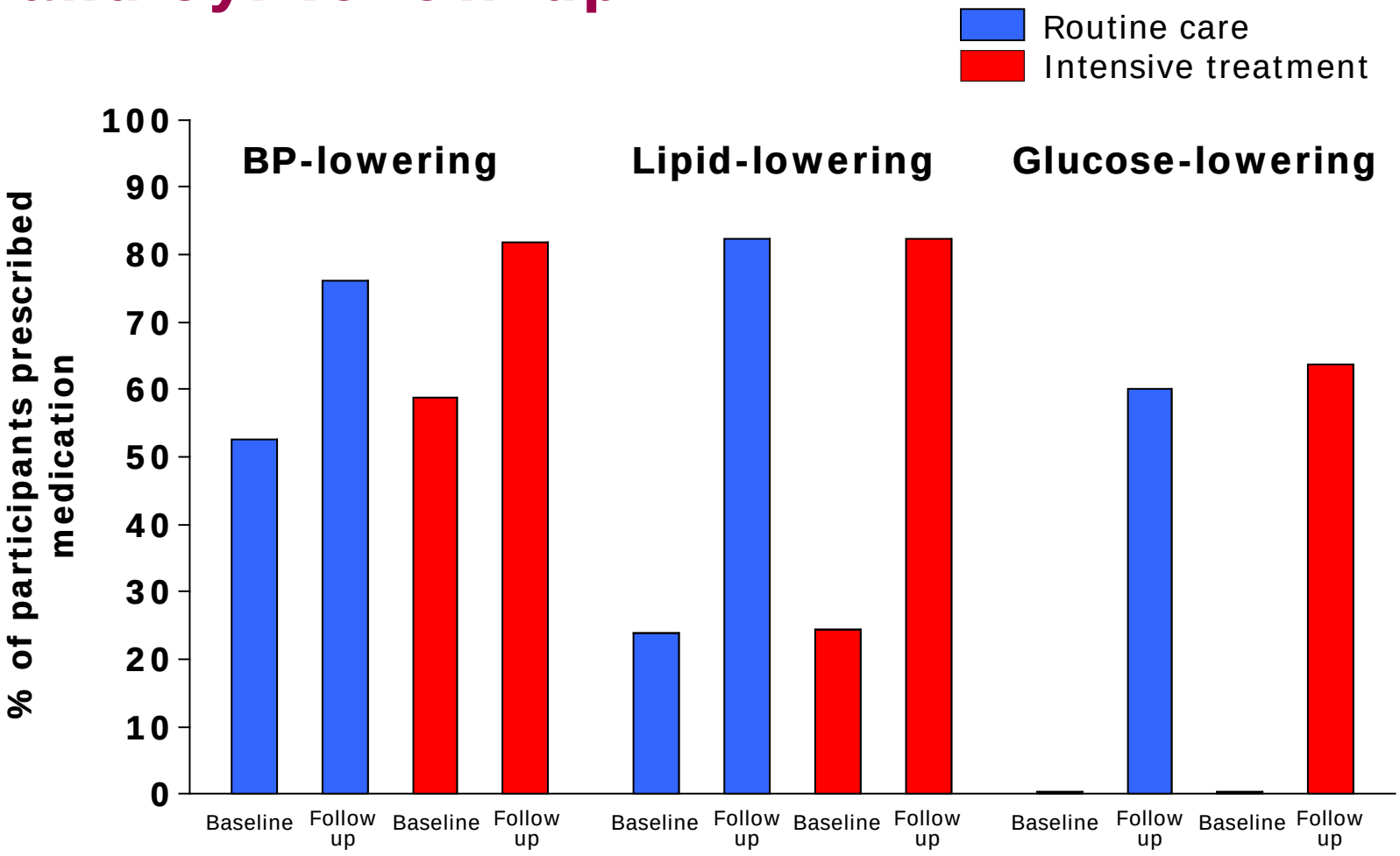
Prescribed treatment at baseline and 5yr follow-up



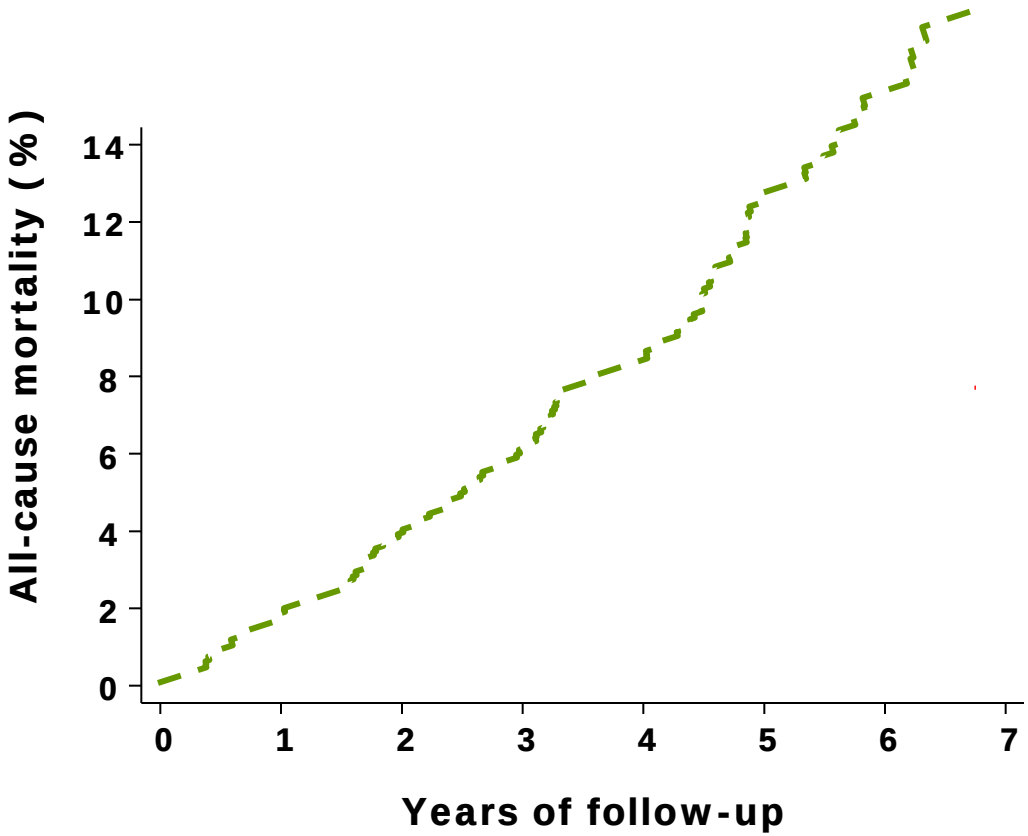
Prescribed treatment at baseline and 5yr follow-up



Prescribed treatment at baseline and 5yr follow-up

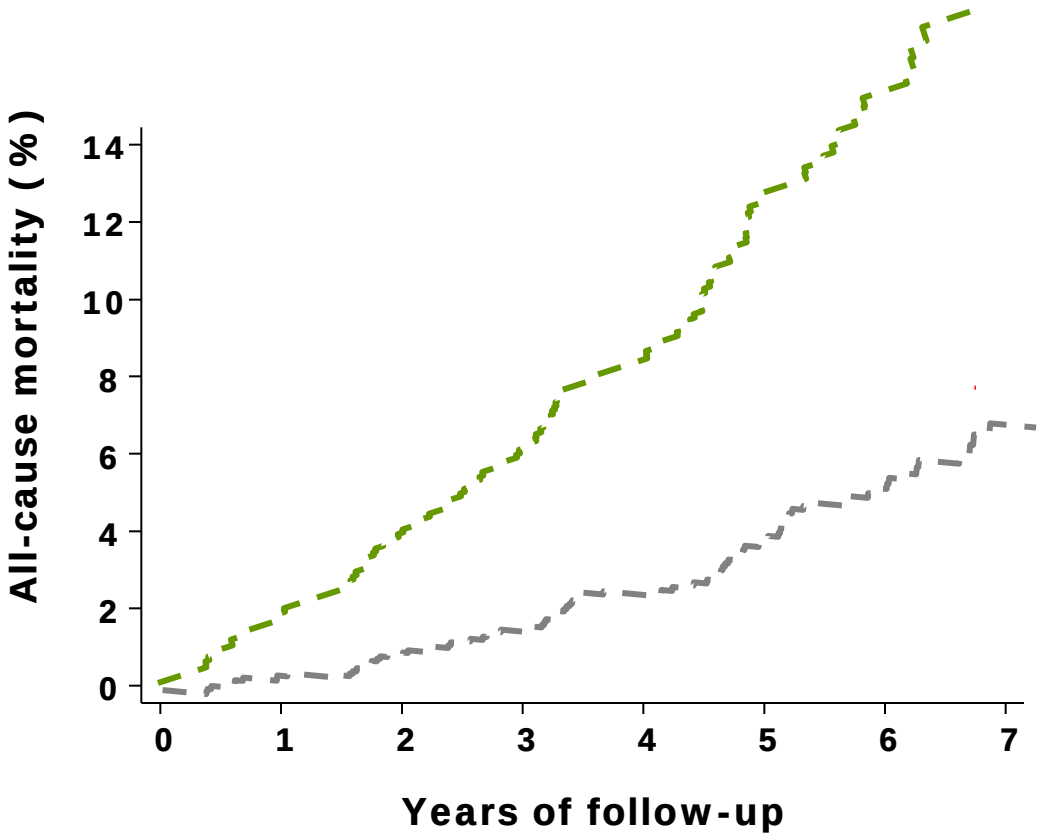


Results in context



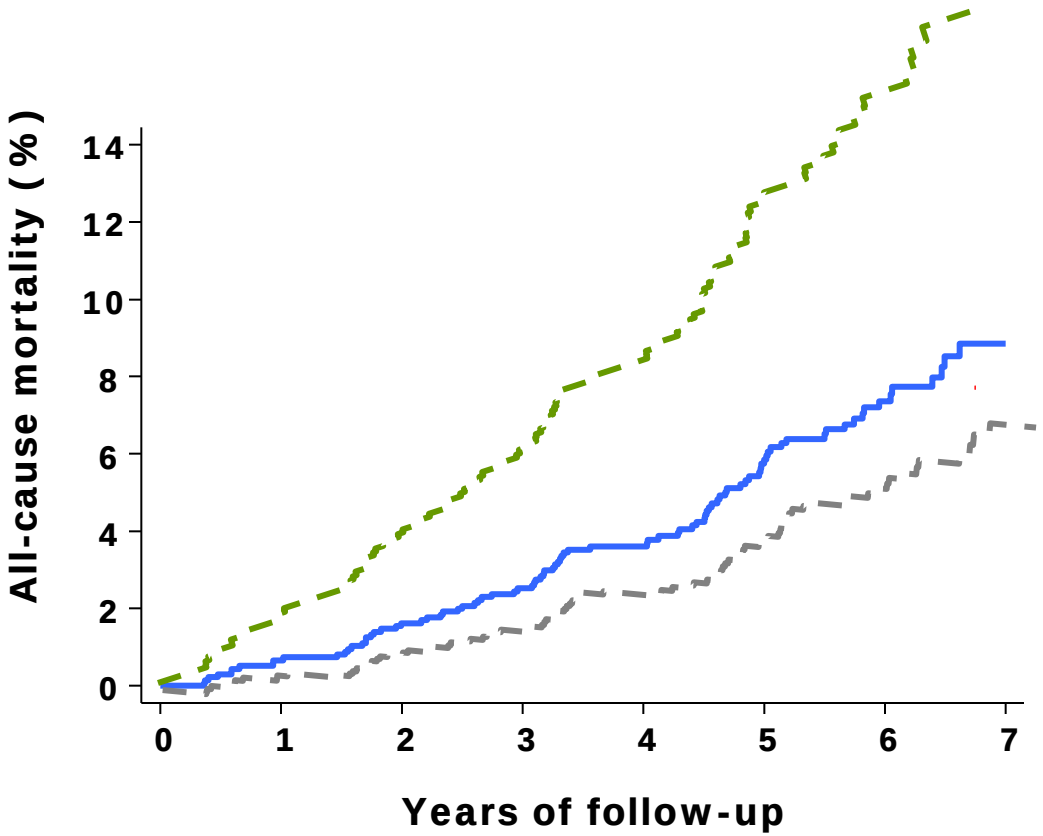
Diabetologia 2008;**51**:2187-2196

Results in context



Diabetologia 2008;**51**:2187-2196

Results in context



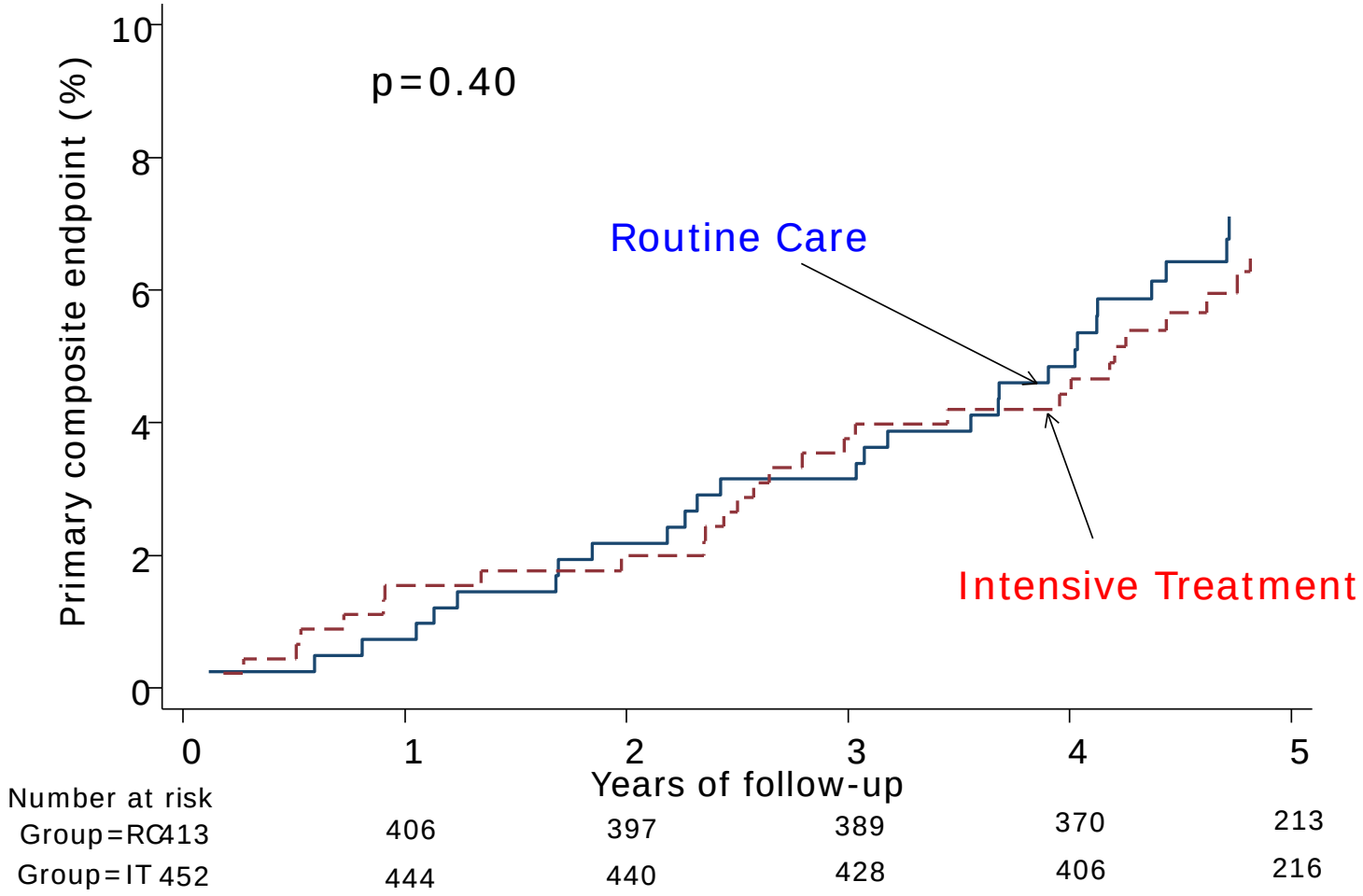
People with diabetes

ADDITION participants

General population without diabetes

Diabetologia 2008;**51**:2187-2196

Chance of having a heart attack or stroke



ADDITION-Plus study

- Does extra support given by lifestyle facilitators improves outcomes in individuals with diabetes?
- Results suggested that the facilitators did not appear to add to what patients and practitioners were already doing
- However, *ADDITION-Plus* participants reported that they appreciated the extra support

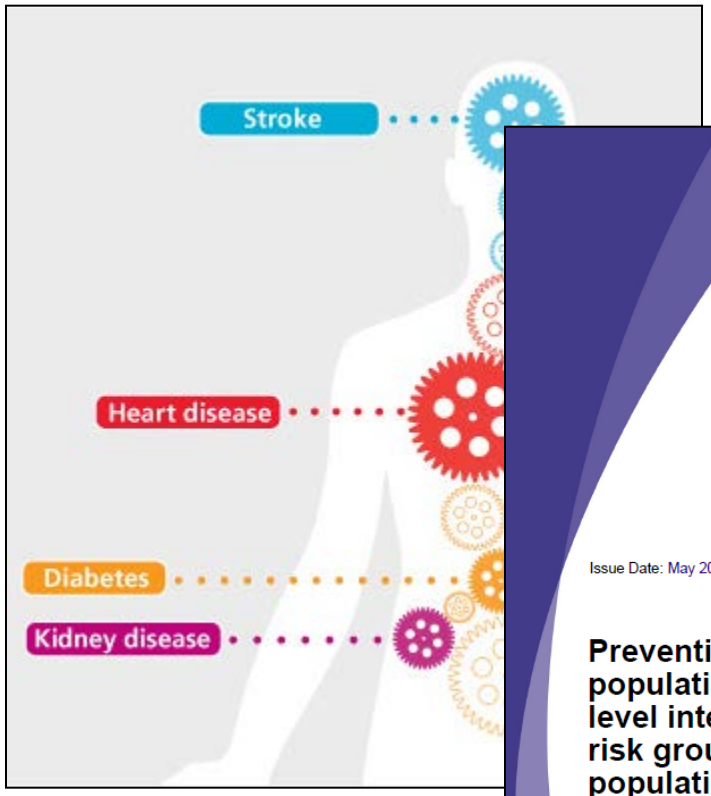
5. Conclusions

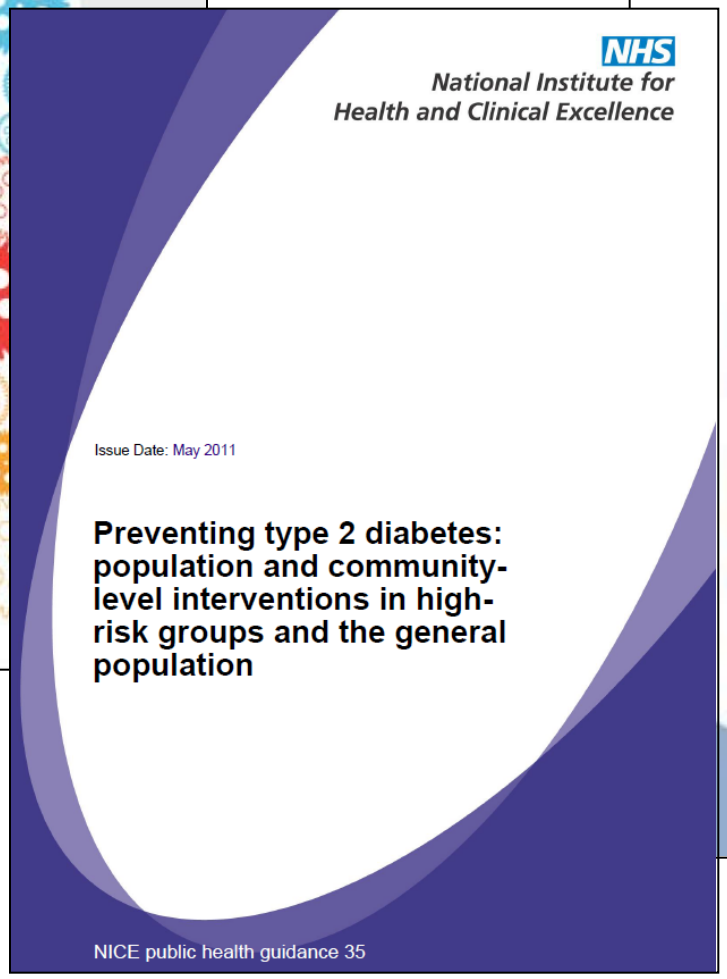
Conclusions

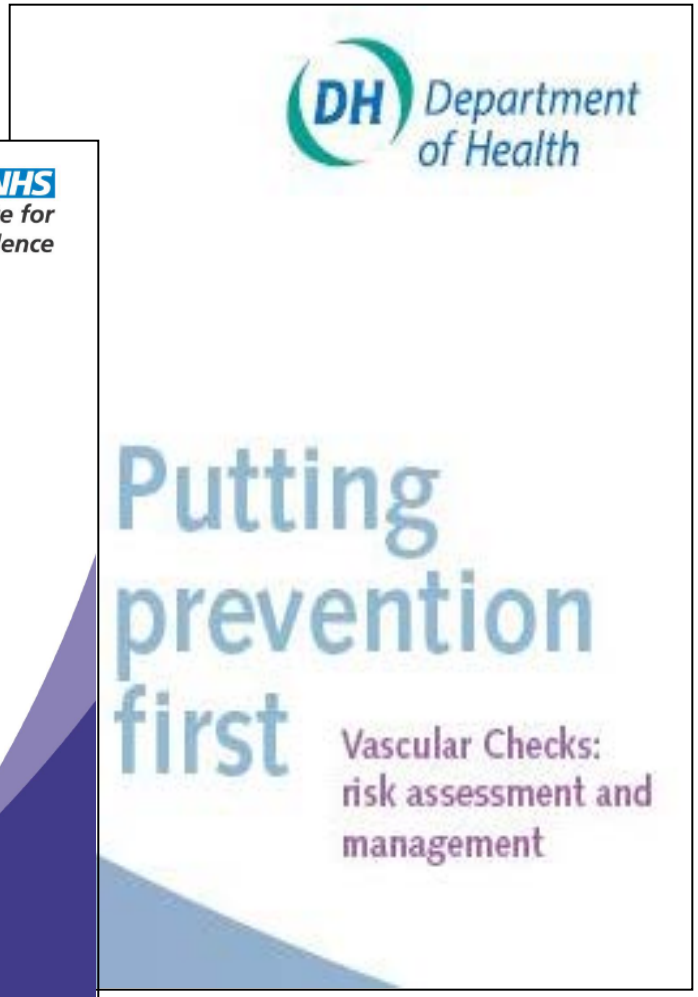
- The health status of *ADDITION* participants was improved five years after diagnosis e.g. there were important reductions in levels of blood pressure, cholesterol and blood glucose.

- Earlier diagnosis and treatment of diabetes has contributed to lower than expected rates of heart attack and premature death, which is now similar to those in the general population.

Public health implications







MRC | Epidemiology Unit

ADDITION-Cambridge study team

Gisela Baker, Daniel Barnes, Mark Betts, Clare Boothby, Sandra Bovan, Parinya Chamnan, Adam Dickinson, Sue Emms, Francis Finucane, Susie Hennings, Muriel Hood, Iain Morrison, Garry King, Christine May Hall, Joanna Mitchell, Kim Mwanza, Paul Roberts, Emanuella De Lucia Rolfe, Stephen Sharp, Rebecca Simmons, Matt Sims, James Sylvester, Liz White
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(Cambridge University Hospitals, NHS Foundation Trust, Cambridge)

Rebecca Abbott, Judith Argles, Rebecca Bale, Roslyn Barling, Sue Boase, Ryan Butler, Pesheya Doubleday, Tom Fanshawe, Philippa Gash, Julie Grant, Wendy Hardeman, Ann-Louise Kinmonth, Richard Parker, Nicola Popplewell, A Toby Prevost, Megan Smith, Stephen Sutton, Fiona Whittle, Kate Williams, Georgina Lewis, Lincoln Sargeant
(Department of Public Health and Primary Care, University of Cambridge)

Robert Henderson
(Hinchingbrooke Hospital, Huntingdon)

Thank you for your participation!

6. Ten-year follow-up