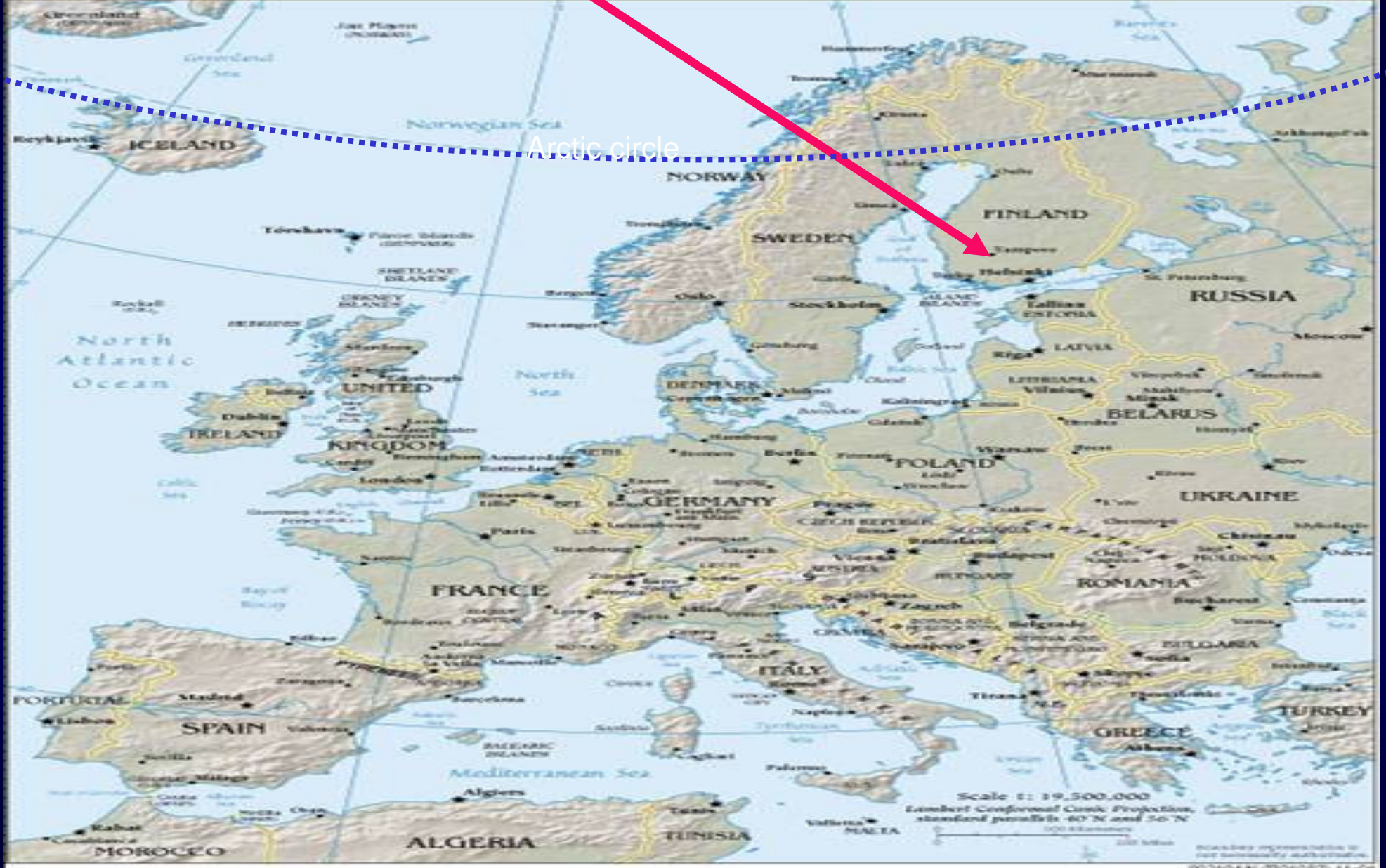


Follow-up of the Finnish Diabetes Prevention Study

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EUROPE



Arctic circle

Scale 1:19,500,000

Lambert Conformal Conic Projection,
standard parallels 40° N and 56° N

BOUNDARY INFORMATION IS
THE SOVEREIGNTY JURISDICTION
90310-041 (REVISED) 11-04

DPS: The Finnish Diabetes Prevention Study

The main aim:

To determine whether lifestyle intervention of overweight, middle-aged subjects with impaired glucose tolerance (IGT) will prevent or delay the development of type 2 diabetes

Study subjects:

- 522 subjects with IGT in two oral glucose tolerance tests
- Age 40–65 years
- BMI > 25 kg/m²
- control group or intensive lifestyle intervention group

DPS:Lifestyle goals

- Weight reduction $> 5\%$
- Fat intake $< 30\text{ E}\%$
- Saturated fat intake $< 10\text{ E}\%$
- Fiber intake $\geq 15\text{ g}/1000\text{ kcal}$
- Physical activity $>30\text{ min/day}$

Intervention group

- Individually tailored diet based on 3-day food diaries
- 7 dietary counselling sessions during the 1st year, every 3 months thereafter
- Free-of-charge gym

Control group

- General advice about healthy diet and exercise habits
- No individualized counselling

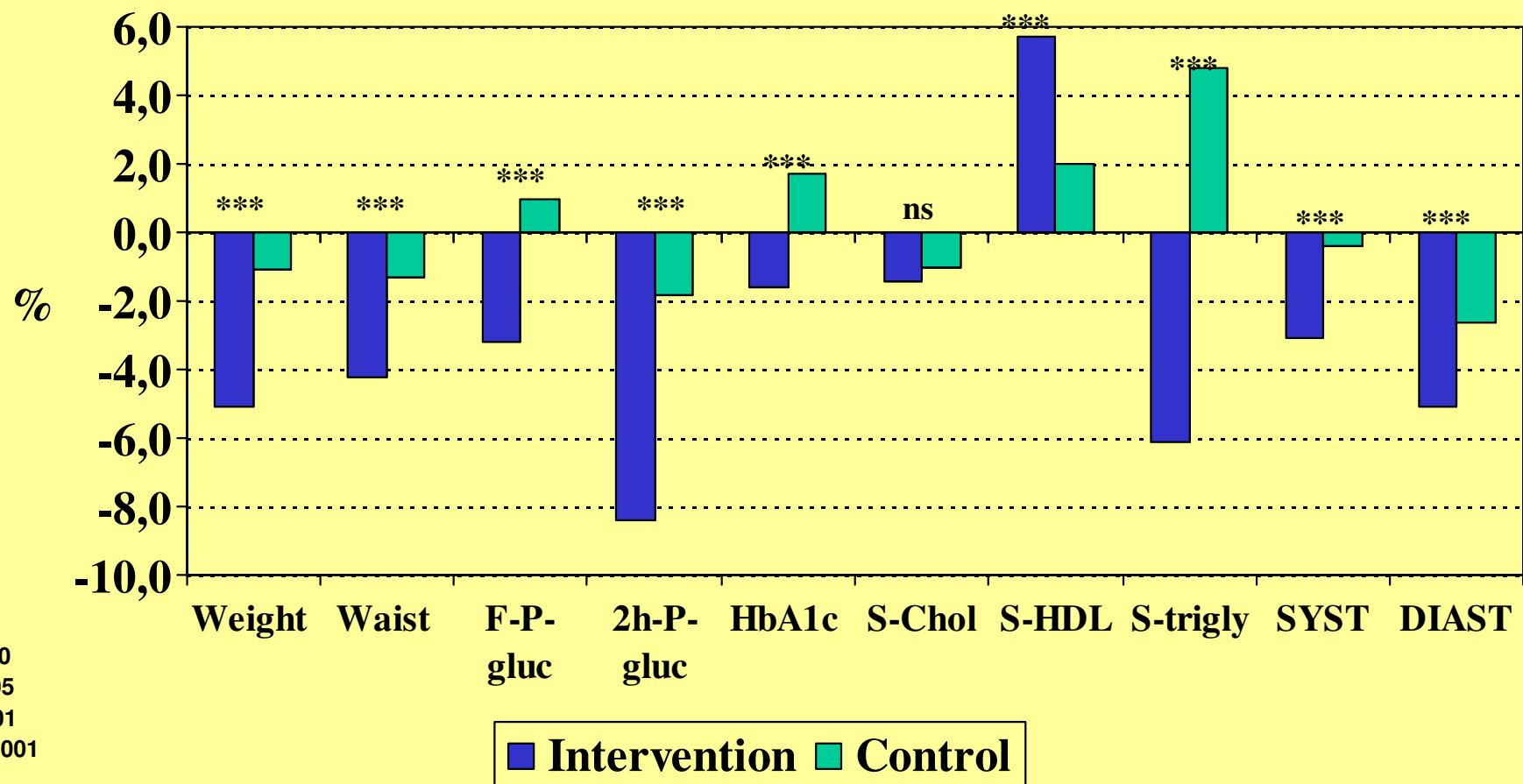
Baseline lifestyle characteristics of the DPS subjects

		Recommendation
Dietary carbohydrates (E%)	43 ± 7	50 - 60
Dietary protein (E%)	18 ± 3	10-20
Dietary total fat (E%)	37 ± 7	< 30
Dietary saturated fat (E%)	17 ± 4	< 10
Dietary fibre (g / 1000 kcal)	12 ± 4	≥ 15
Physical activity (h/week)		
- total	5.7	
- moderate or vigorous	2.7	> 4

Leisure time physical activity at baseline and at year 1 in the intervention (I) and control (C) groups

	Baseline		Year 1	
	I	C	I	C
	%	%	%	%
None	34	32	14	30
Light	56	58	60	57
Moderate or heavy	10	10	26	13
p-value	0.892		0.001	

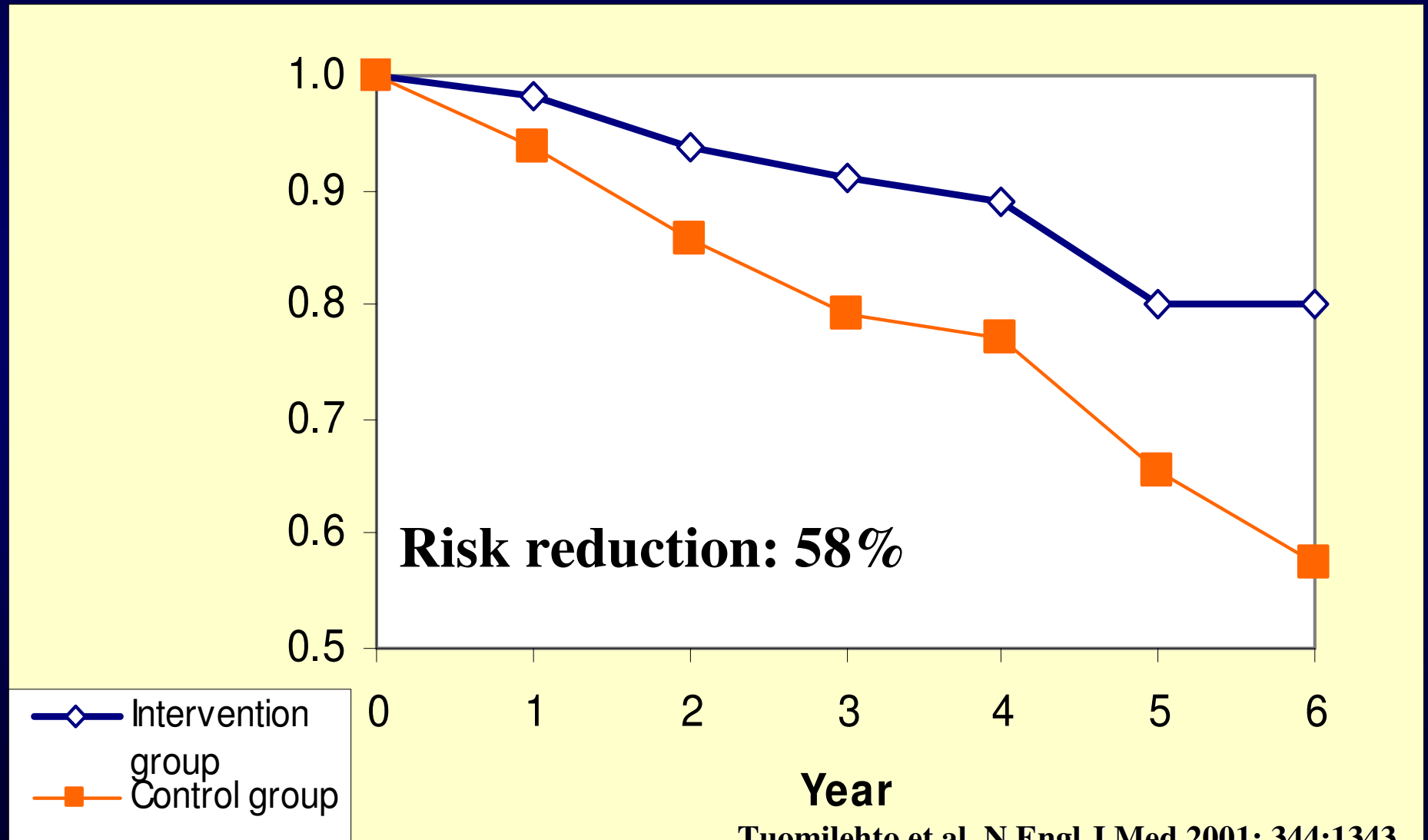
Changes (%) in clinical and metabolic parameters from baseline to year 1



DPS - Interim analysis of end-points

- **The first participants were randomized in 1993.**
- **The study was estimated to last for 6 years.**
- **160 cases of diabetes was expected to occur.**
- **An interim analysis by randomization group was planned when 80 cases of diabetes had been accumulated.**
- **The analysis was carried out by an independent statistician .**
- **The median follow-up time at the time of the interim analysis was 3.2 years (range 1-6 years)**

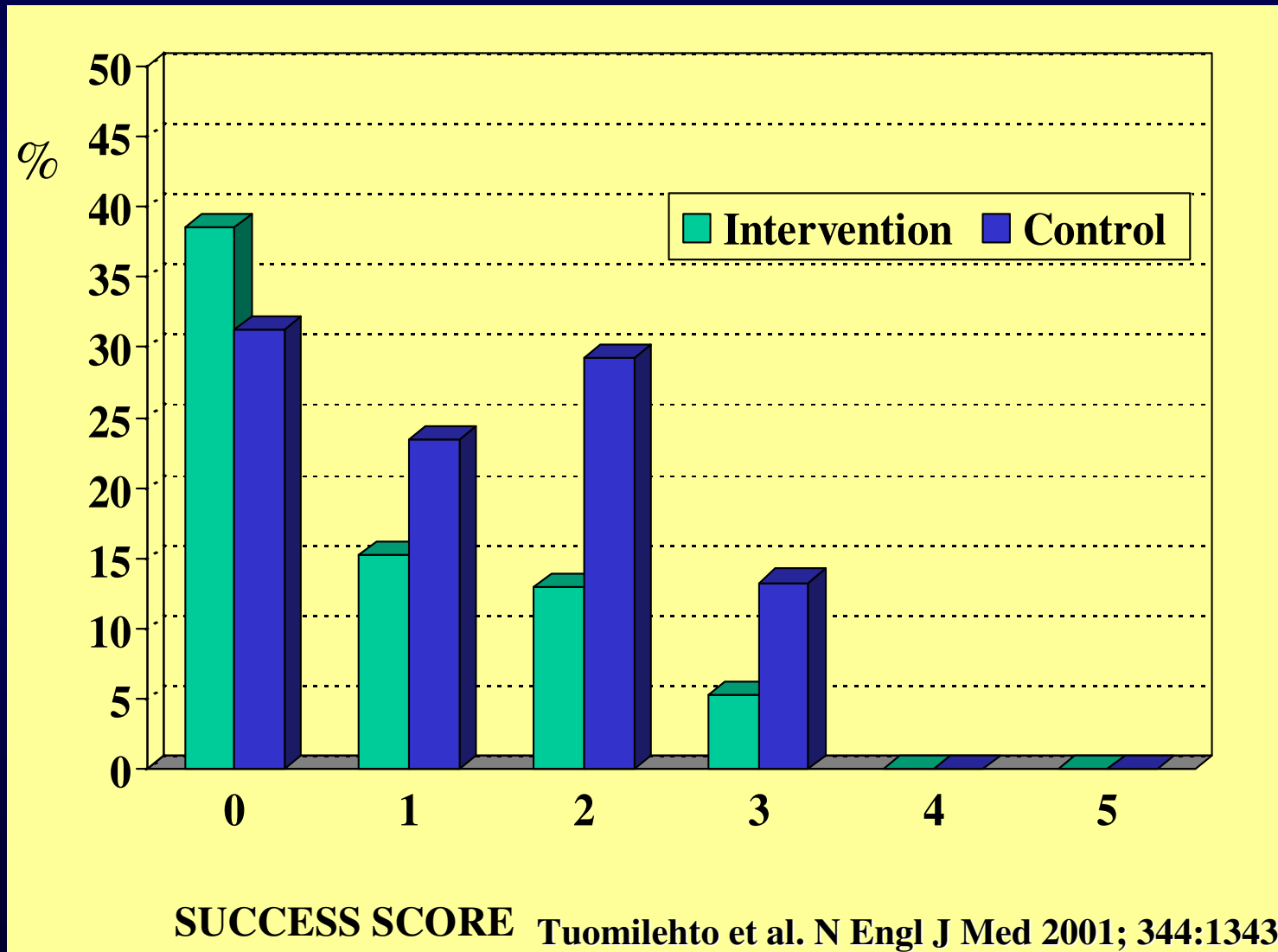
Development of diabetes during the lifestyle intervention in the intervention and control groups - DPS



Reduction in diabetes risk when achieving the specific lifestyle target - DPS

TARGET	ALL SUBJECTS	
	Odds Ratio (95% CI)	Risk reduction (%)
Weight loss >5%	0.34 (0.12-0.50)	66 %
Total Fat < 30E%	0.47 (0.28-0.81)	53 %
Saturated Fat < 10 E%	0.46 (0.16-0.81)	54 %
Fiber > 15 g/1000 kcal	0.29 (0.12-0.69)	71 %
Exercise >4h/week	0.38 (0.23-0.64)	62 %

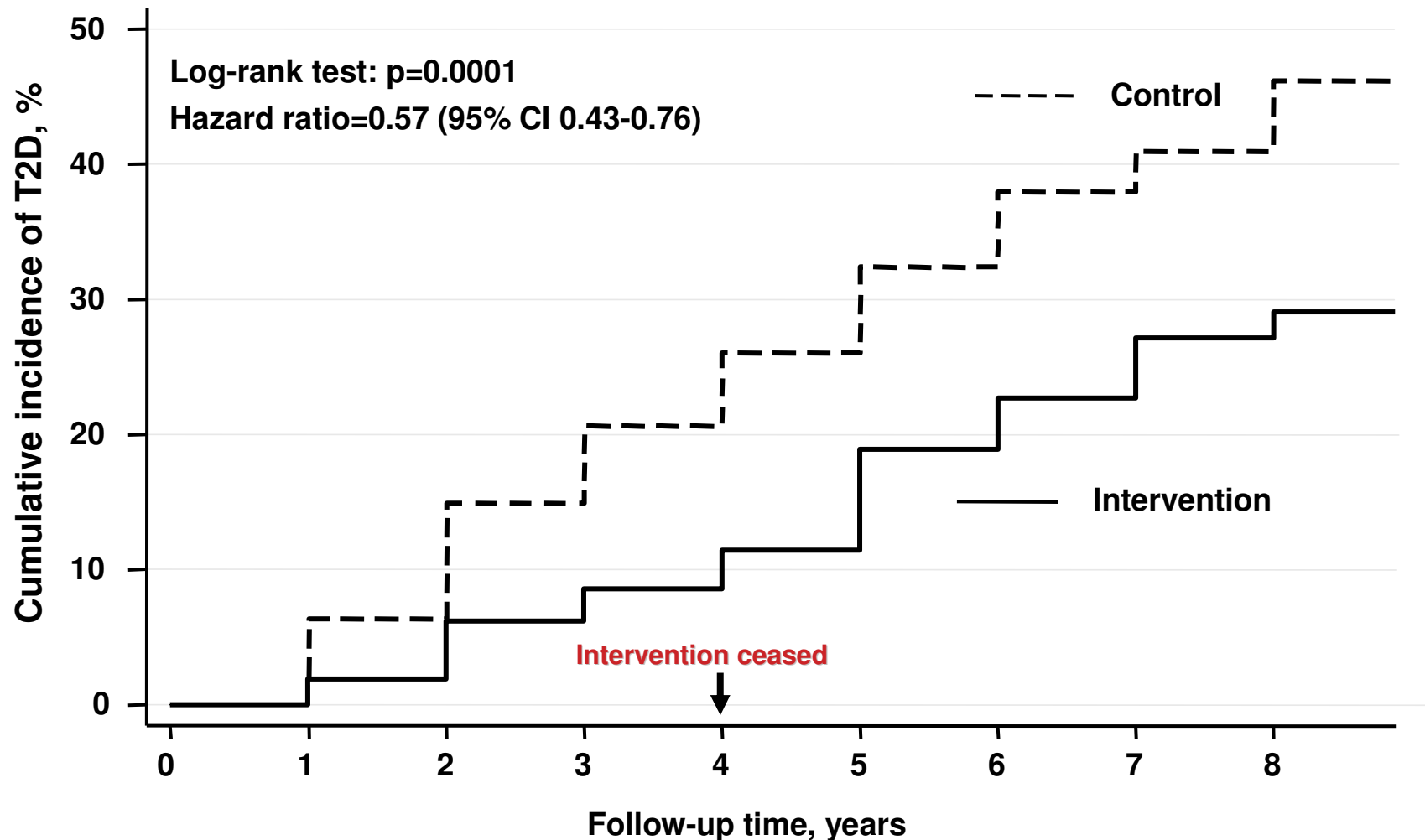
Proportion of subjects becoming diabetic by success in achieving the intervention targets at one-year examination - DPS



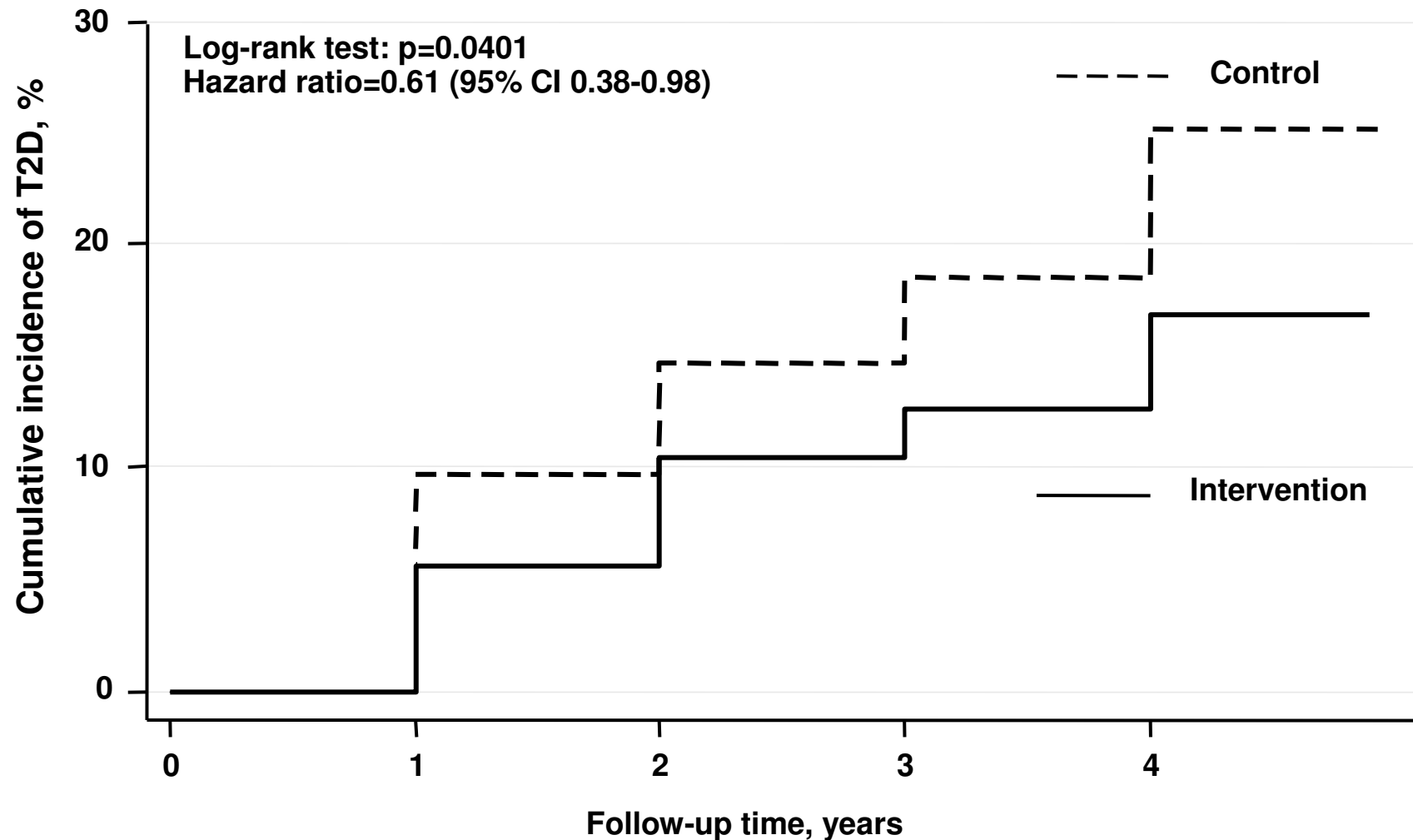
DPS FOLLOW-UP STUDY: THE MAIN AIM

- 1. To determine whether lifestyle guidance of overweight, middle-aged subjects with impaired glucose tolerance (IGT) will prevent or delay the development of type 2 diabetes in long run.**
- 2. To determine the incidence of cardiovascular events and other complications of hyperglycaemia.**

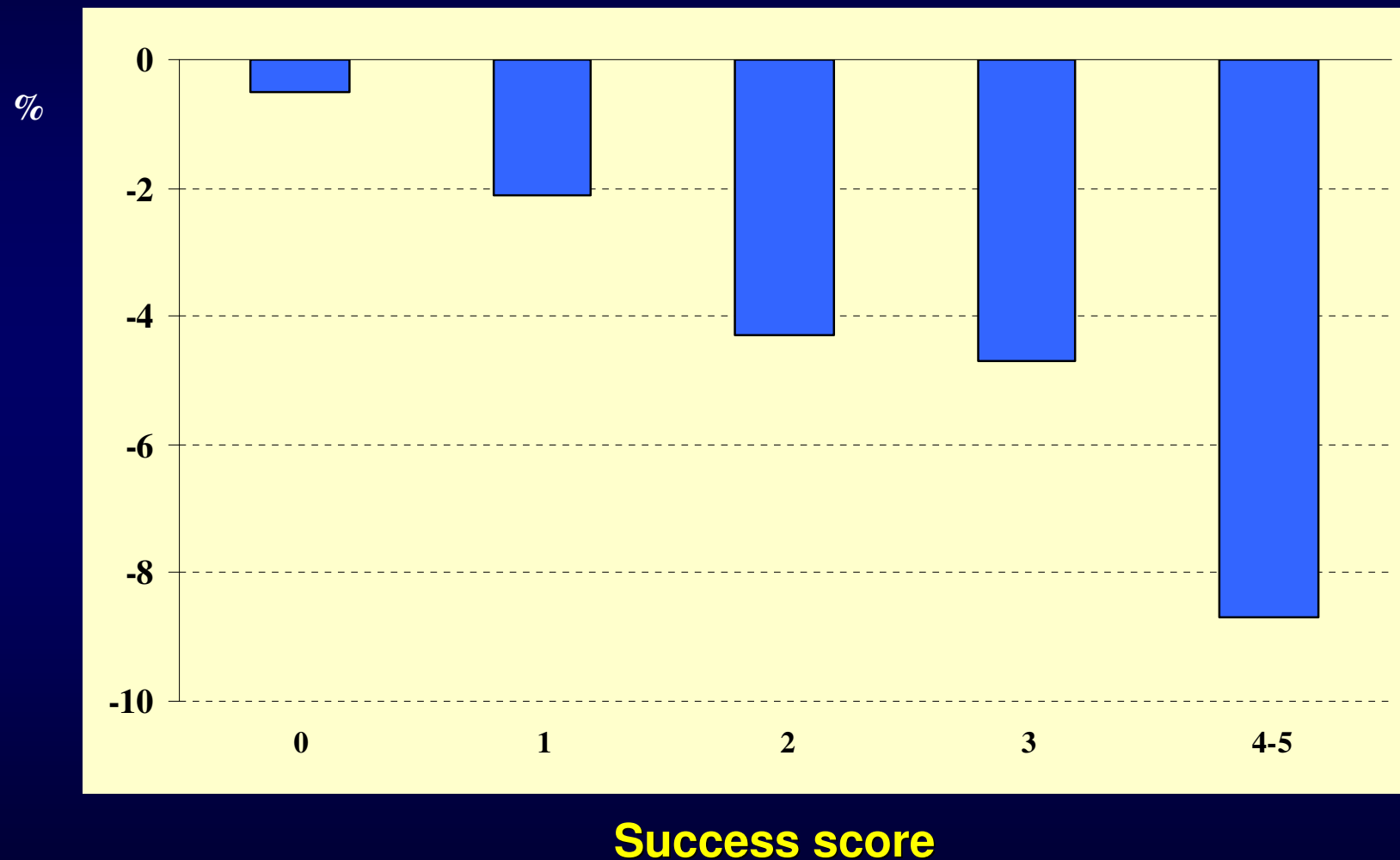
DPS: Diabetes incidence by the randomization group during the total extended follow-up period



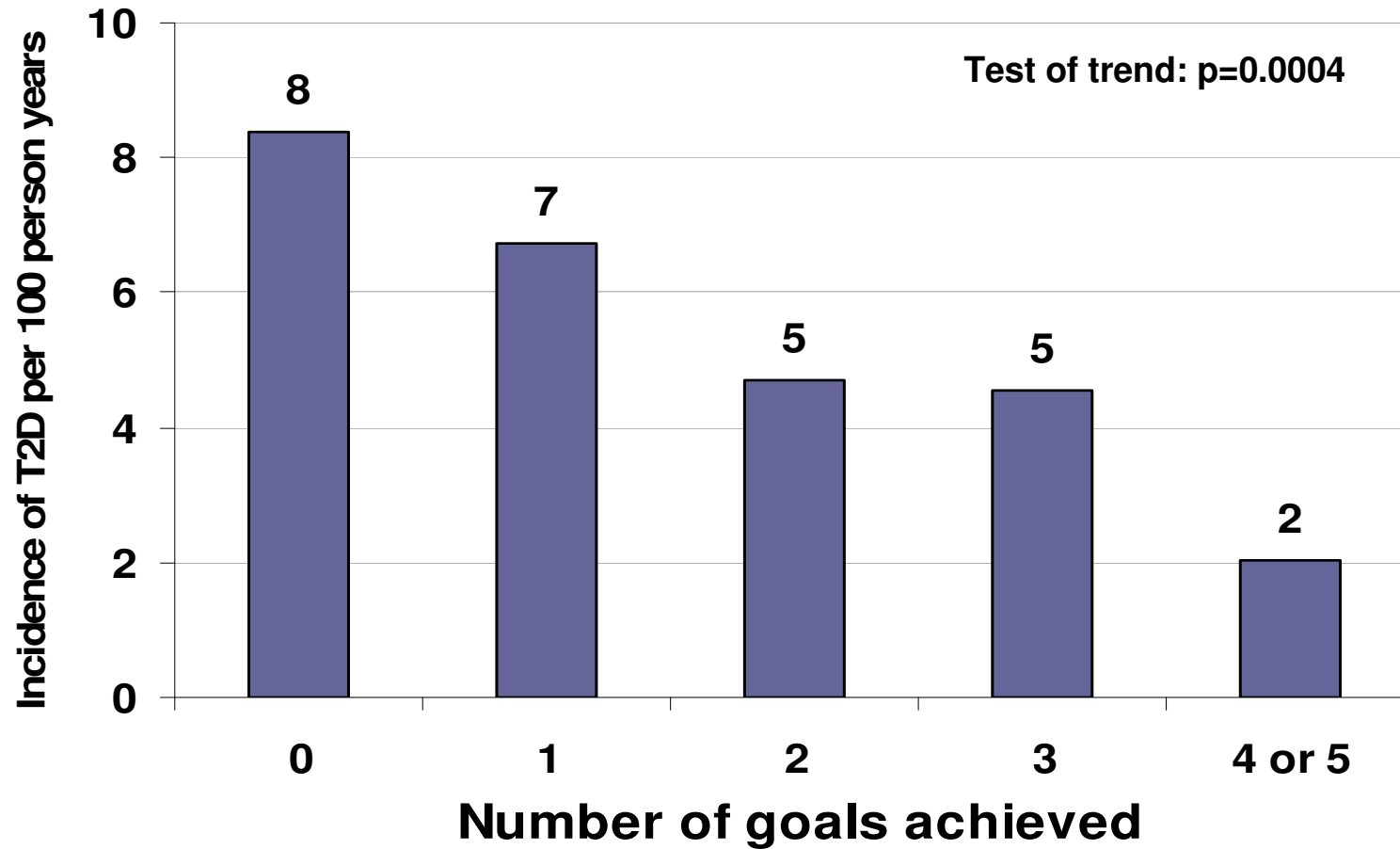
DPS : Diabetes incidence by the randomisation group during the post-intervention follow-up period



Weight reduction (%) from baseline by success score (number of intervention goals achieved) at year 3 -DPS



DPS study: Diabetes incidence by success score (number of intervention goals achieved) at year 3

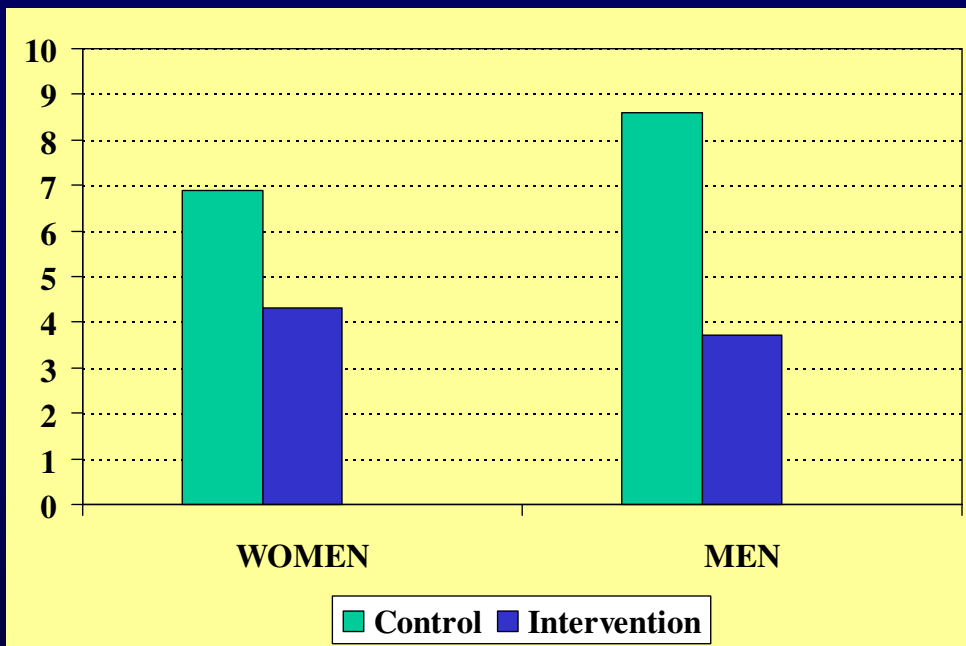


DPS study: Proportion (%) of persons achieving predefined intervention goals

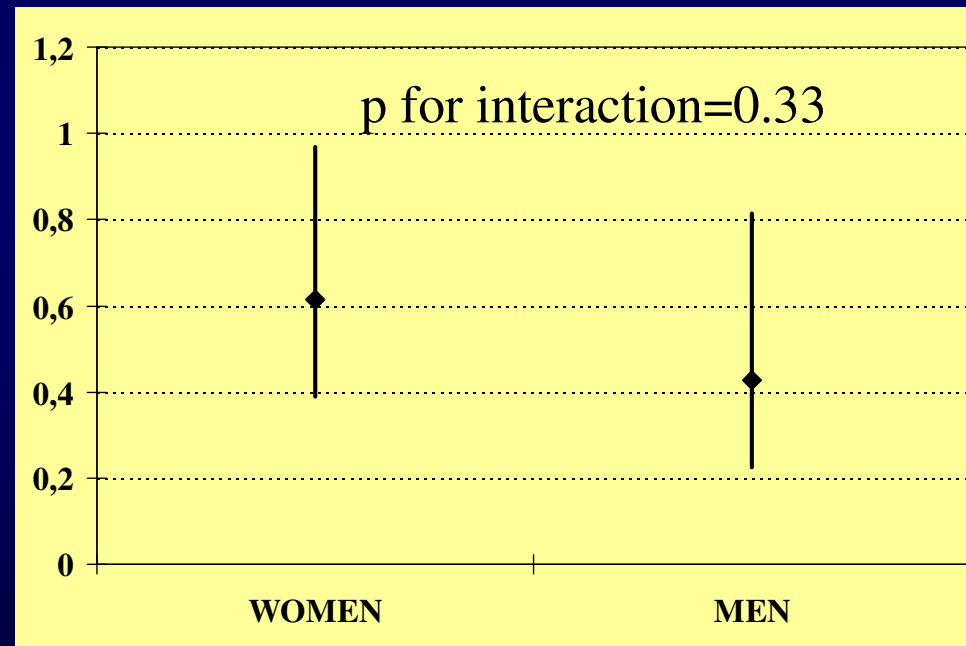
Goals	3-year F-U		1st post-intervention F-U*	
	Intervention	Control	Intervention	Control
0	10	27	7	14
1	31	41	32	40
2	24	22	24	25
3	21	5	19	14
4-5	14	6	18	7
P-value	<0.0001		0.0042	

* excluding diabetics during intervention period.

DPS: Diabetes in the Intervention vs. Control group by sex

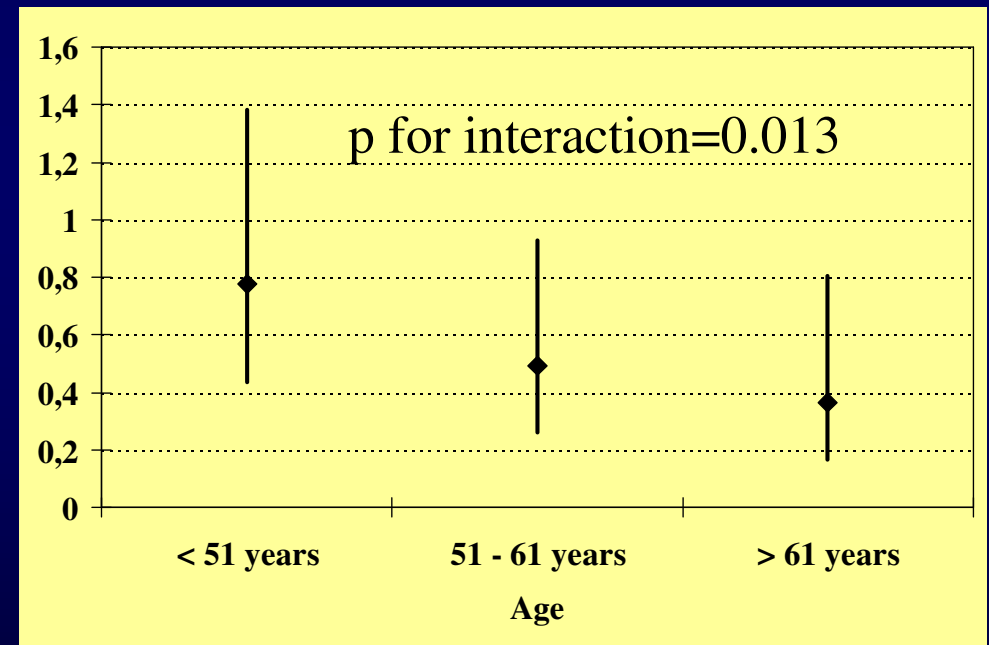
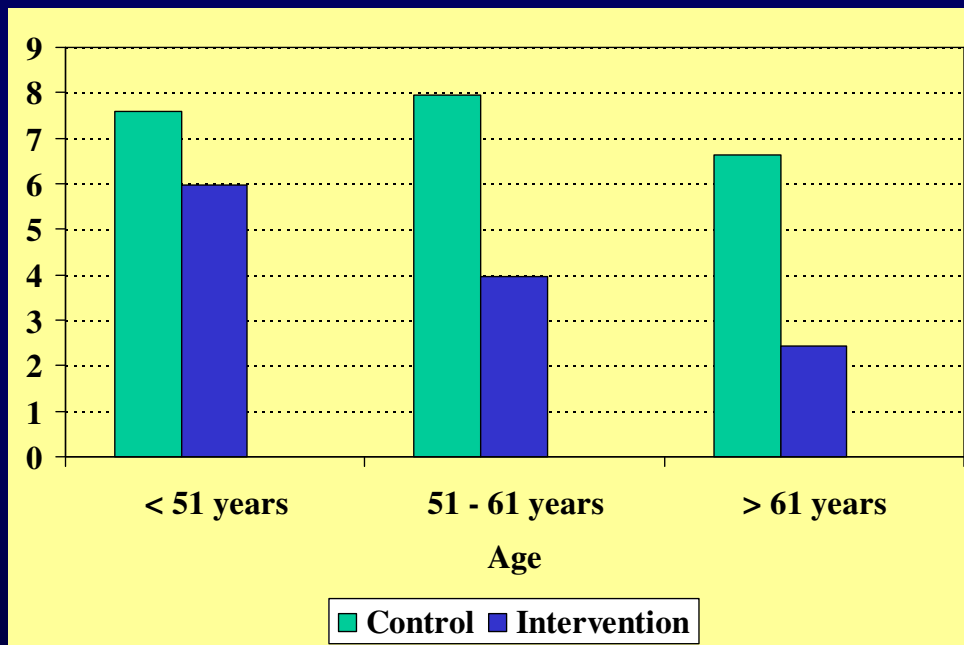


Incidence rate per 100 person-years



Hazard ratio

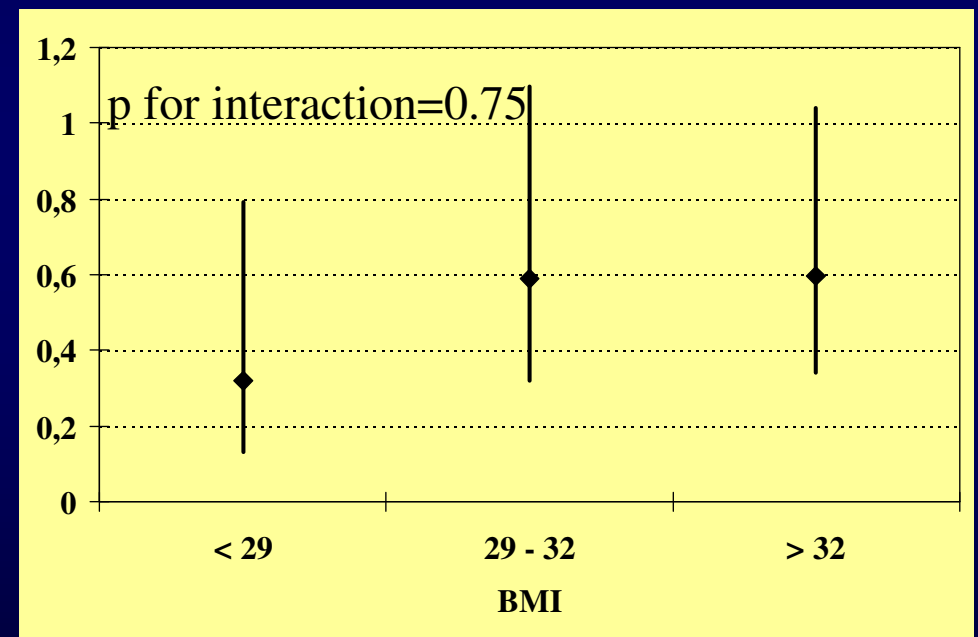
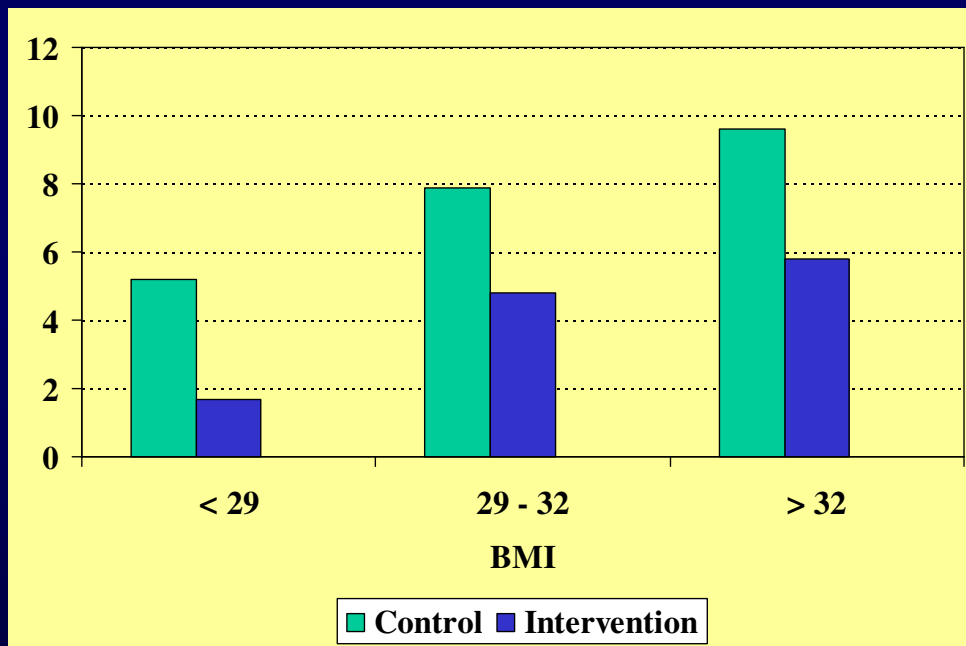
DPS: Diabetes in the Intervention vs. Control group by age



Incidence rate per 100 person-years

Hazard ratio

DPS: Diabetes in the Intervention vs. Control group by baseline BMI



Incidence rate per 100 person-years

Hazard ratio

**People at risk of
type 2 diabetes –**

How to find them?

FINnish Diabetes RIsk SCore

FINDRISC

n=509

Score range 1-24 p

Median score among the
DPS participants: 13
men:12, women:14

Lindström et al.
Diabetes Care 2003; 26: 725-731

TYPE 2 DIABETES RISK ASSESSMENT FORM

Circle the right alternative and add up your points.

1. Age

- 0 p. Under 45 years
- 2 p. 45–54 years
- 3 p. 55–64 years
- 4 p. Over 64 years

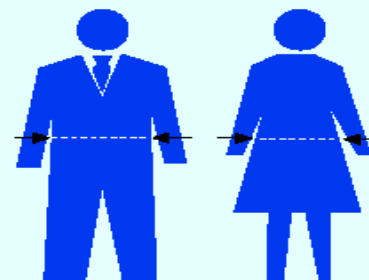
2. Body-mass index

(See reverse of form)

- 0 p. Lower than 25 kg/m²
- 1 p. 25–30 kg/m²
- 3 p. Higher than 30 kg/m²

3. Waist circumference measured below the ribs (usually at the level of the navel)

- | | MEN | WOMEN |
|------|------------------|-----------------|
| 0 p. | Less than 94 cm | Less than 80 cm |
| 3 p. | 94–102 cm | 80–88 cm |
| 4 p. | More than 102 cm | More than 88 cm |



4. Do you usually have daily at least 30 minutes of physical activity at work and/or during leisure time (including normal daily activity)?

- 0 p. Yes
- 2 p. No

5. How often do you eat vegetables, fruit or berries?

- 0 p. Every day
- 1 p. Not every day

6. Have you ever taken antihypertensive medication regularly?

- 0 p. No
- 2 p. Yes

7. Have you ever been found to have high blood glucose (eg in a health examination, during an illness, during pregnancy)?

- 0 p. No
- 5 p. Yes

8. Have any of the members of your immediate family or other relatives been diagnosed with diabetes (type 1 or type 2)?

- 0 p. No
- 3 p. Yes: grandparent, aunt, uncle or first cousin (but no own parent, brother, sister or child)
- 5 p. Yes: parent, brother, sister or own child

Total Risk Score

The risk of developing type 2 diabetes within 10 years is

Lower than 7 **Low:** estimated 1 in 100 will develop disease

7–11 **Slightly elevated:** estimated 1 in 25 will develop disease

12–14 **Moderate:** estimated 1 in 6 will develop disease

15–20 **High:** estimated 1 in 3 will develop disease

Higher than 20 **Very high:** estimated 1 in 2 will develop disease

Please turn over

RISK ASSESSMENT FORM

your points.

6. Have you ever taken antihypertensive medication regularly?

0 p. No
2 p. Yes

7. Have you ever been found to have high

1. Age

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- 2 p. 45–54 years
- 3 p. 55–64 years
- 4 p. Over 64 years

2. Body-mass index

(See reverse of form)

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MEN

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WOMEN

- Less than 80 cm
- 80–88 cm
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activity?

0 p. Yes
2 p. No

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1 p. Not every day

Total Risk Score



The risk of developing type 2 diabetes within 10 years is

Lower than 7 Low: estimated 1 in 100 will develop disease

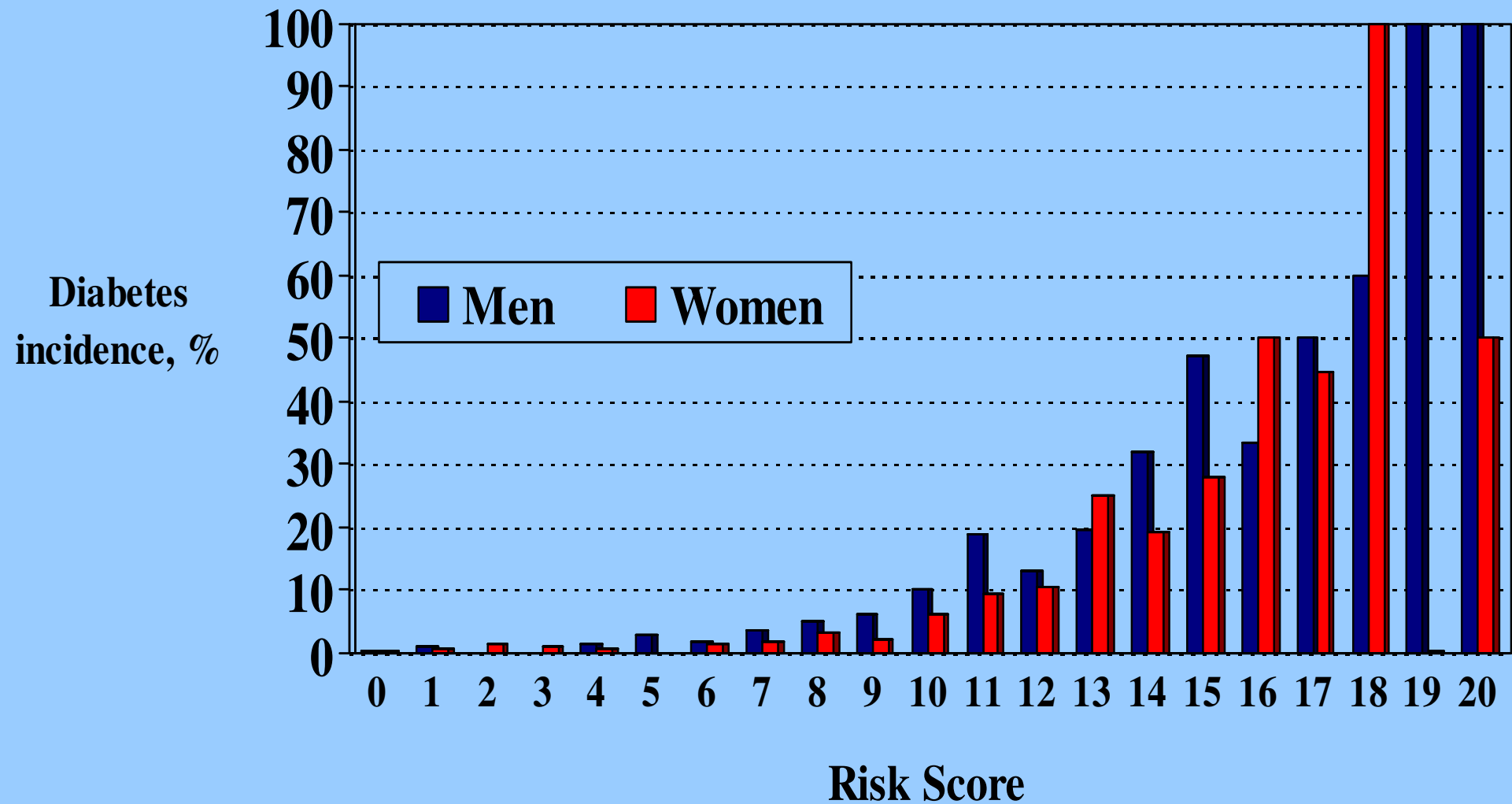
7–11 Slightly elevated: estimated 1 in 25 will develop disease

12–14 Moderate: estimated 1 in 6 will develop disease

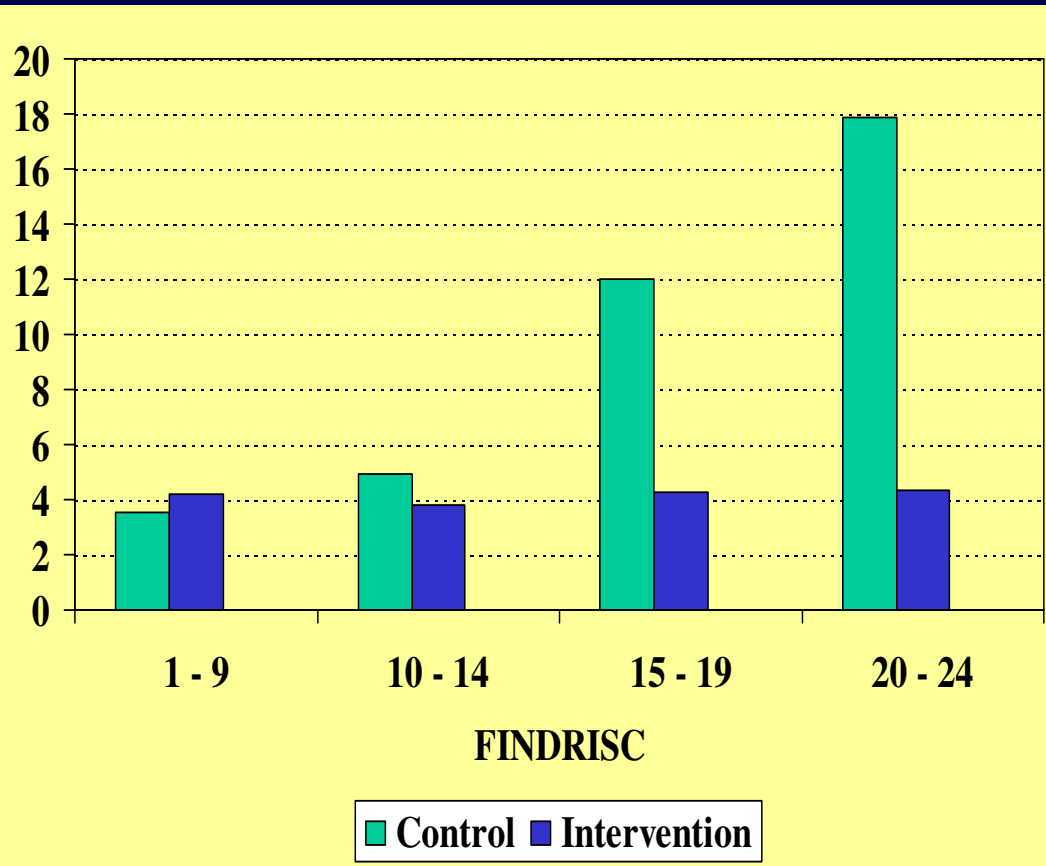
15–20 High: estimated 1 in 3 will develop disease

Higher than 20 Very high: estimated 1 in 2 will develop disease

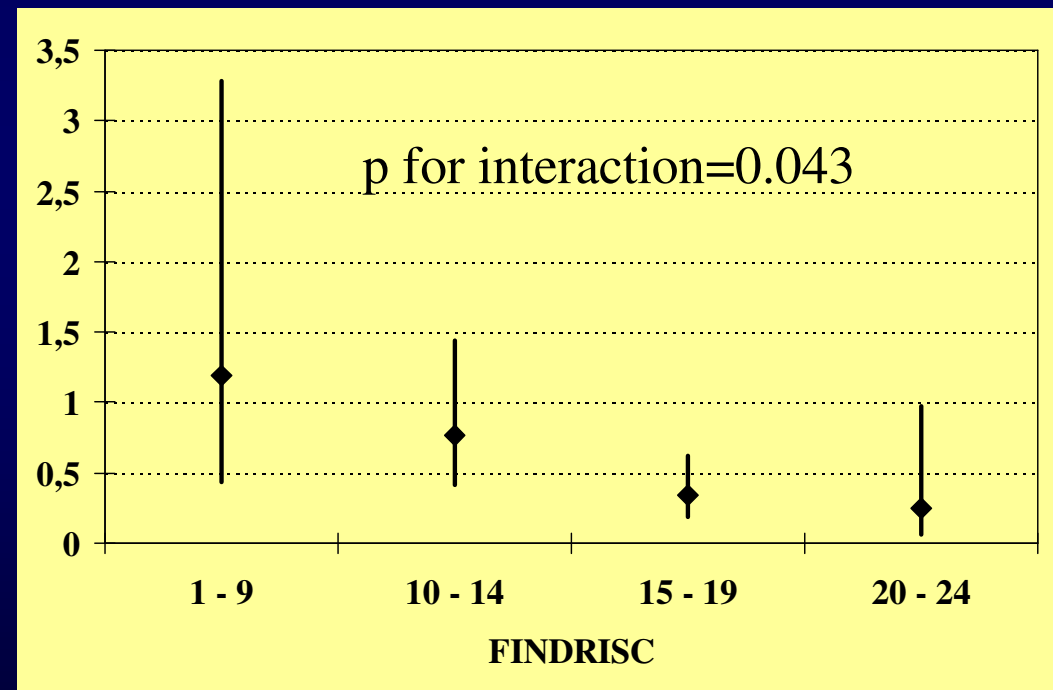
Diabetes incidence during 10-year follow-up by baseline FINDRISC value



DPS: Diabetes in the Intervention vs. Control group by baseline FINDRISC value

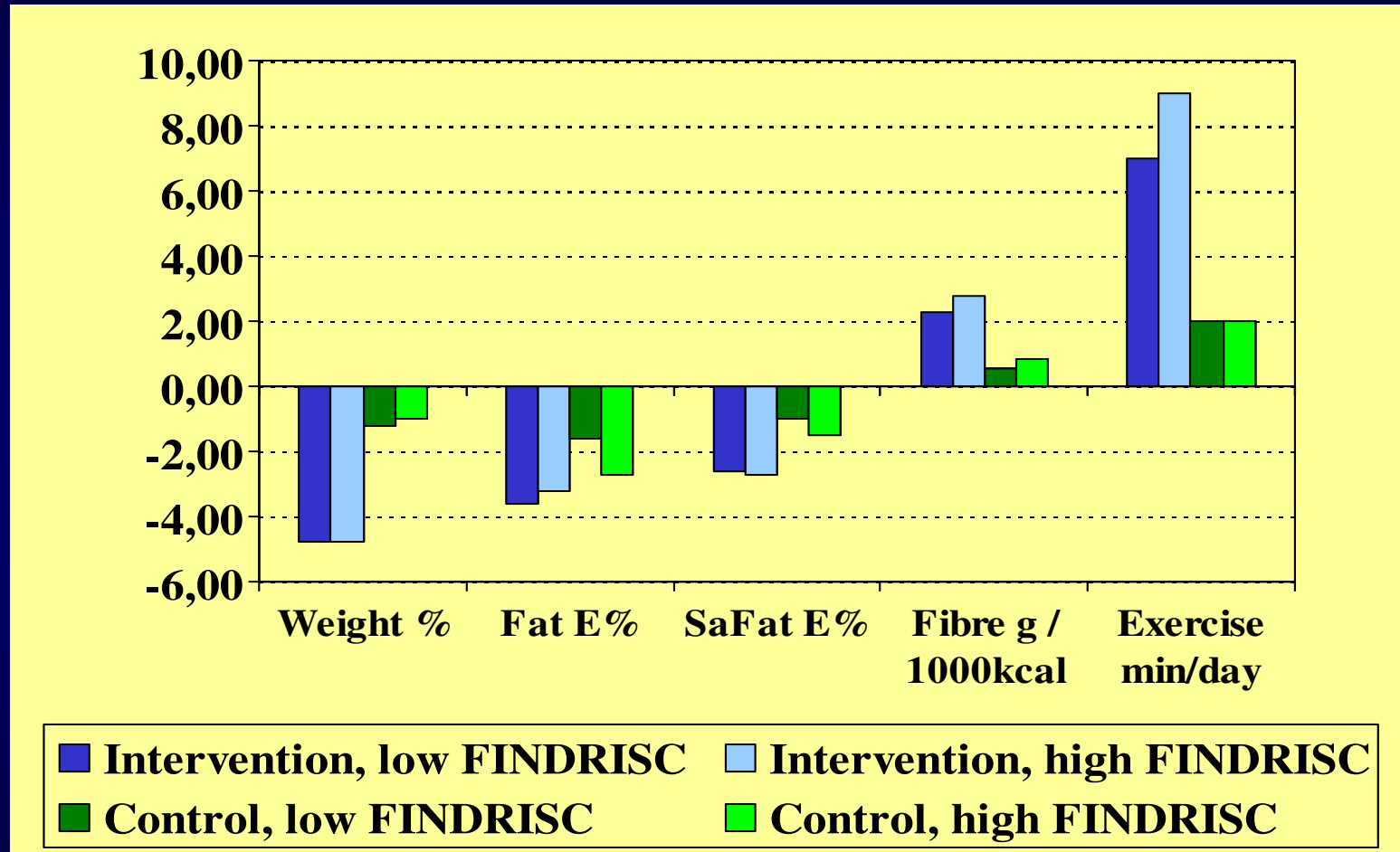


Incidence rate per 100 person-years



Hazard ratio

1-year lifestyle changes in the Intervention and Control groups by FINDRISC



➔ p for interaction (FINDRISC*group) ns for all

The Finnish Diabetes Prevention Study Group

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