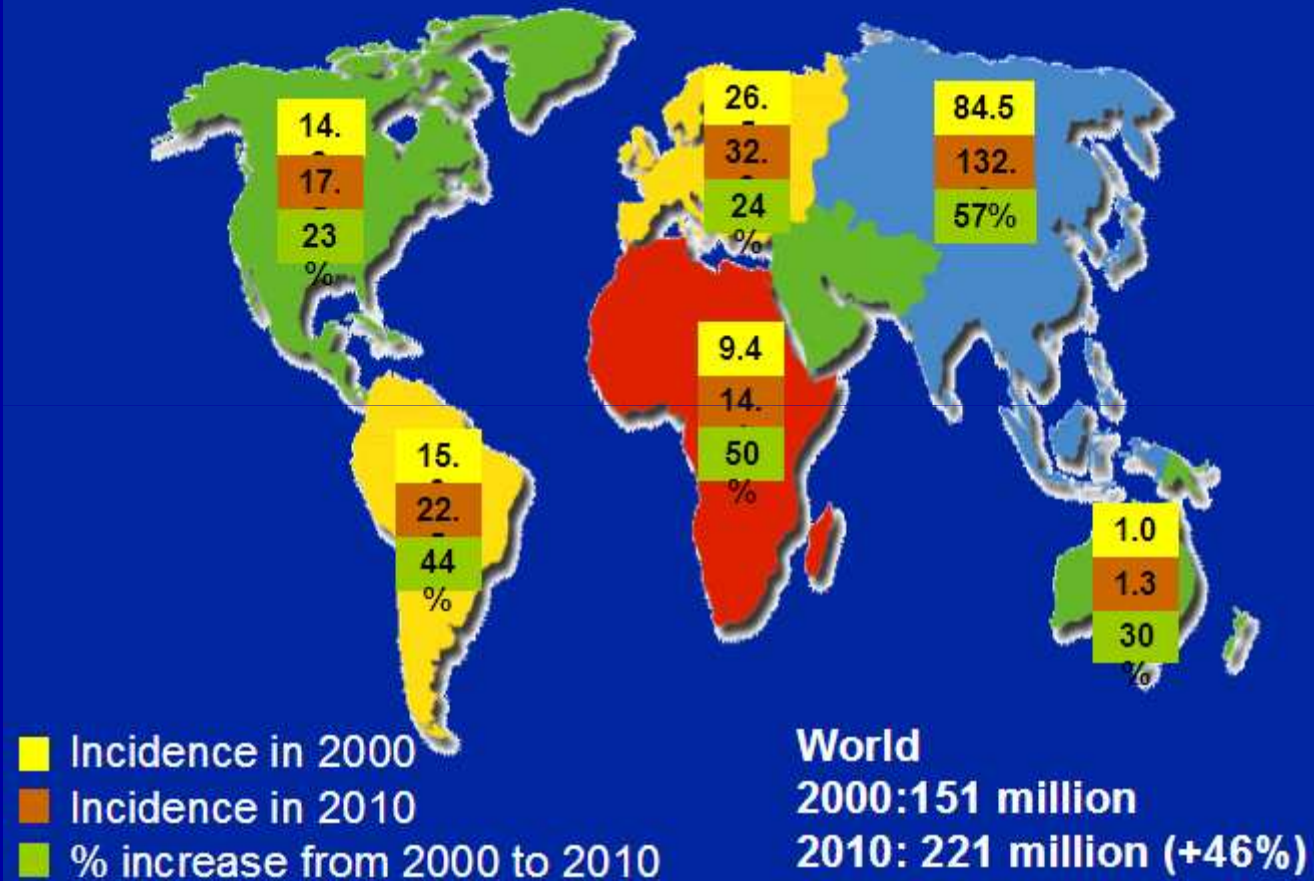


Eccesso ponderale e malattia diabetica

Andrea Corsi

15 dicembre 2011

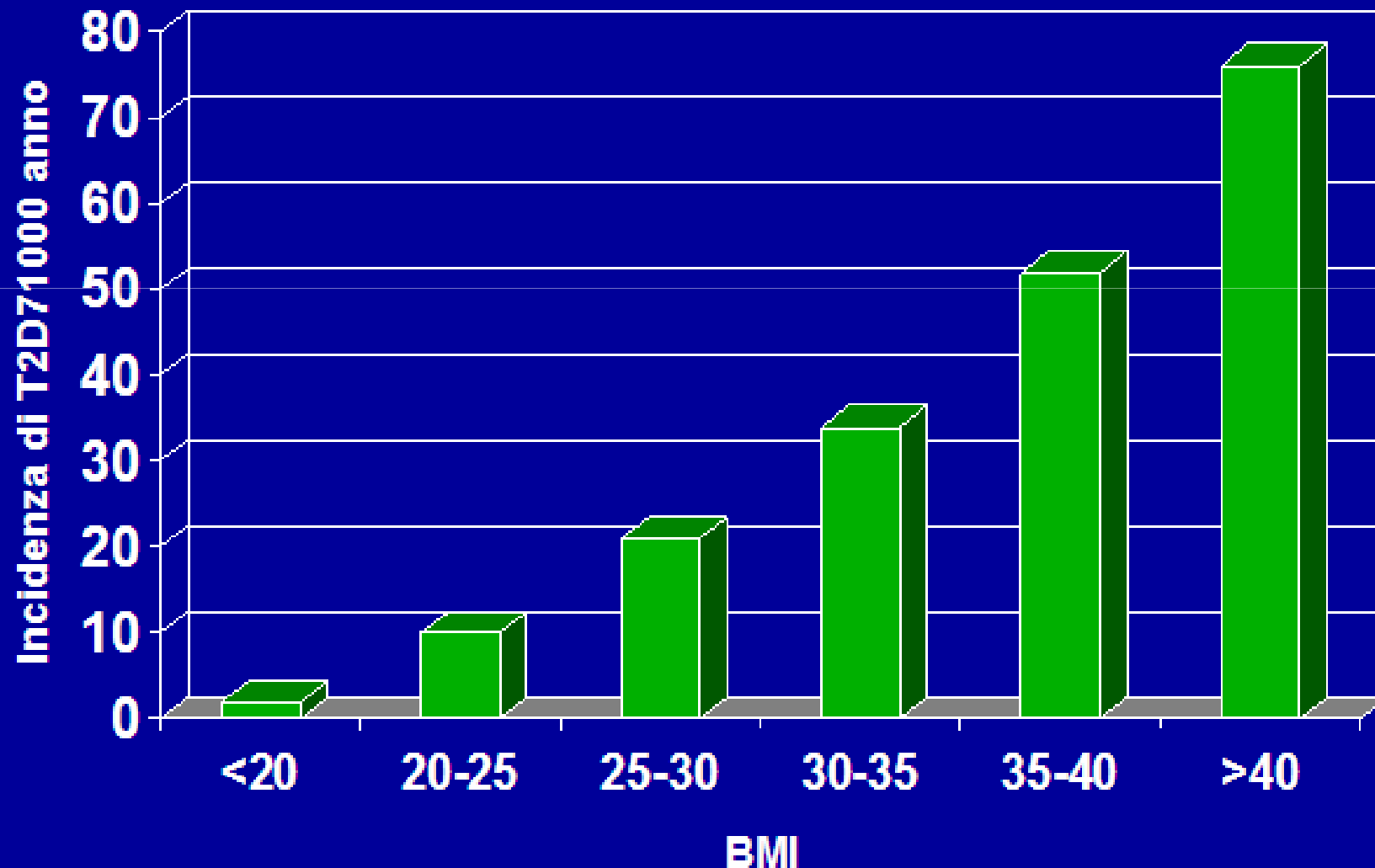
The Diabetes Epidemic



Adapted from Amos AF et al *Diabet Med* 1997;14:S7-S85.

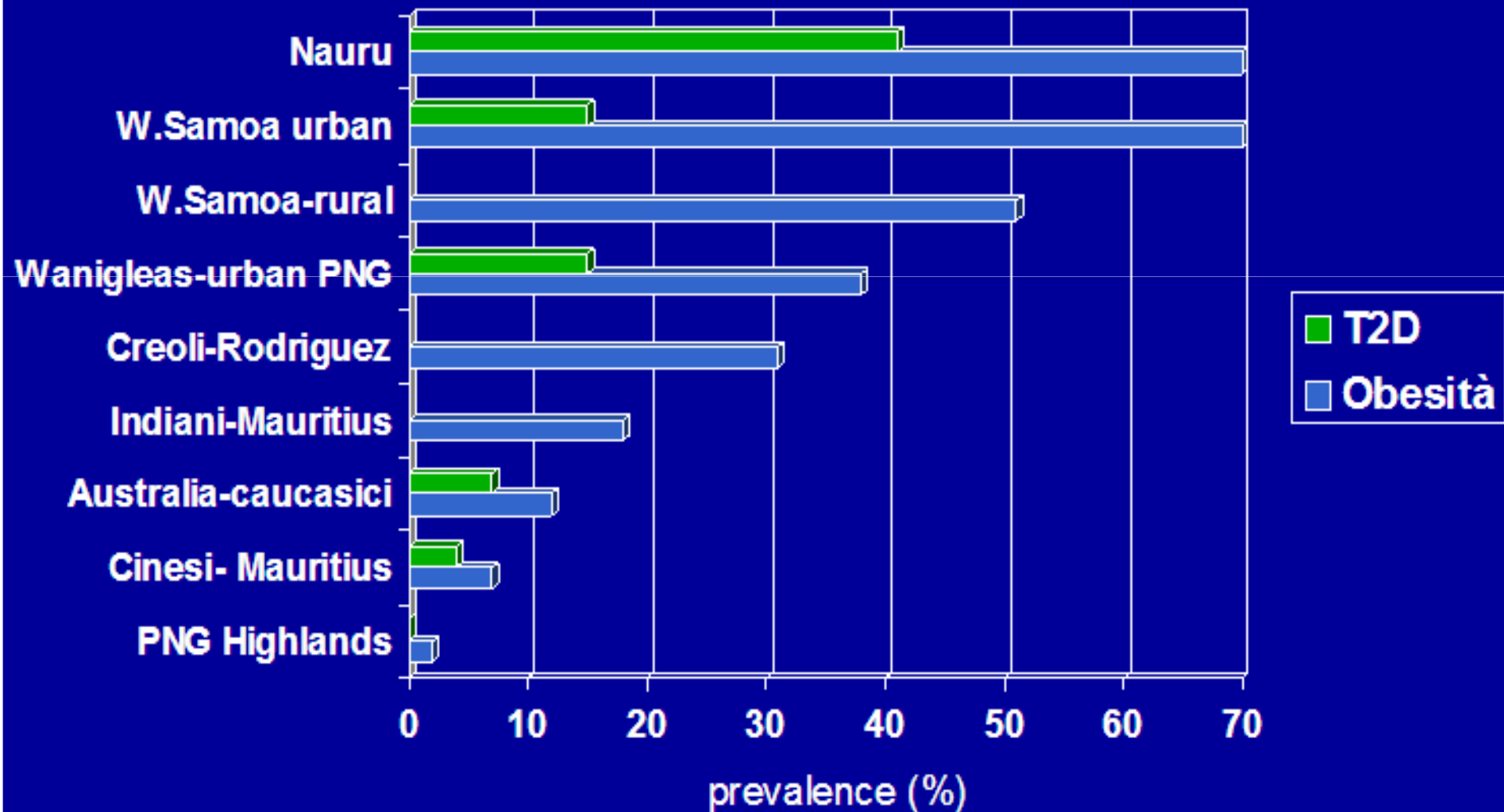
Diabesità:incidenza

USA: Indiani Pima (adulti) - incidenza/1000 anno



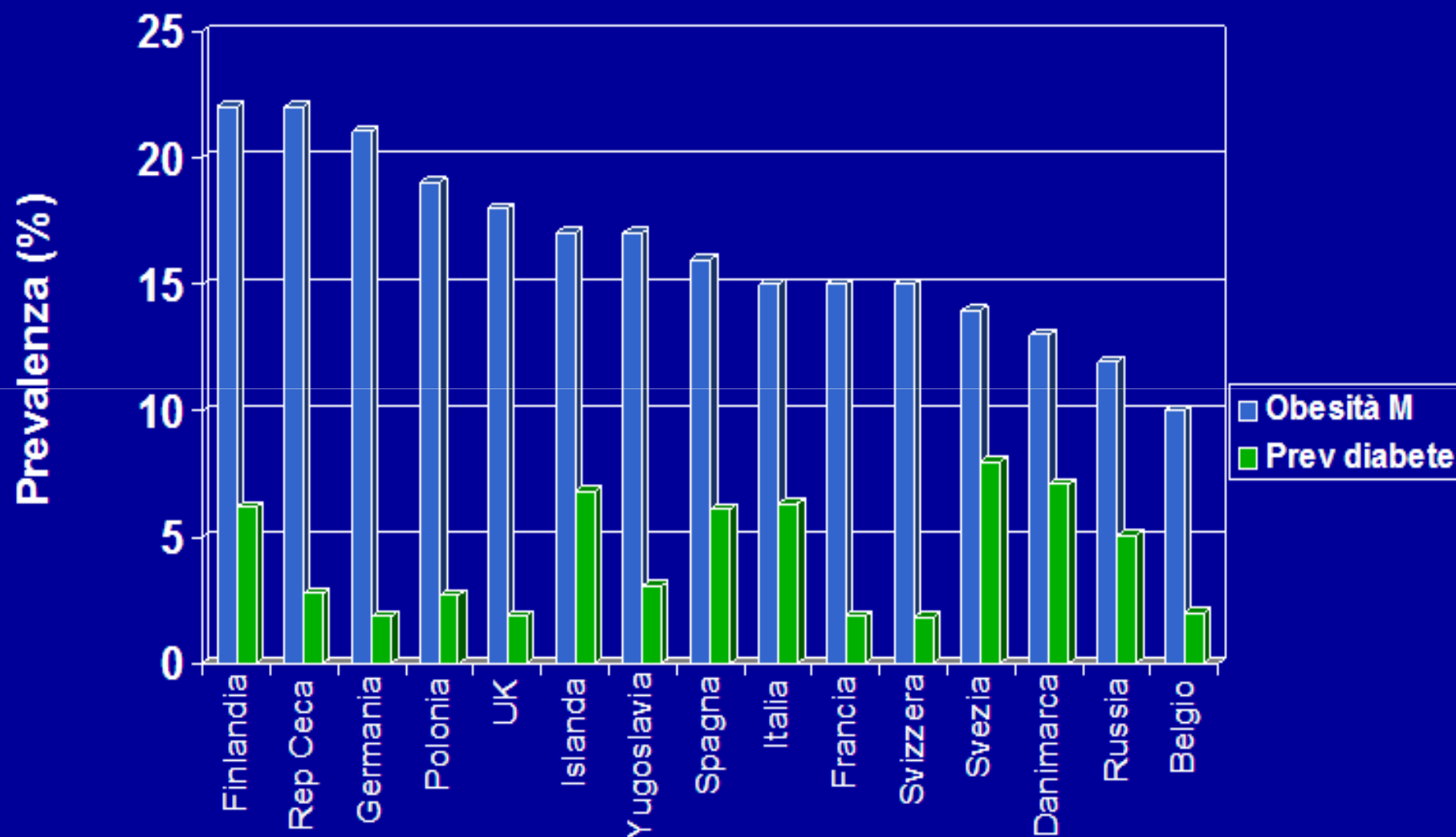
Diabesità: prevalenza

Asia e Pacifico: popolazione adulta



Diabesità: prevalenza

Europa – maschi adulti

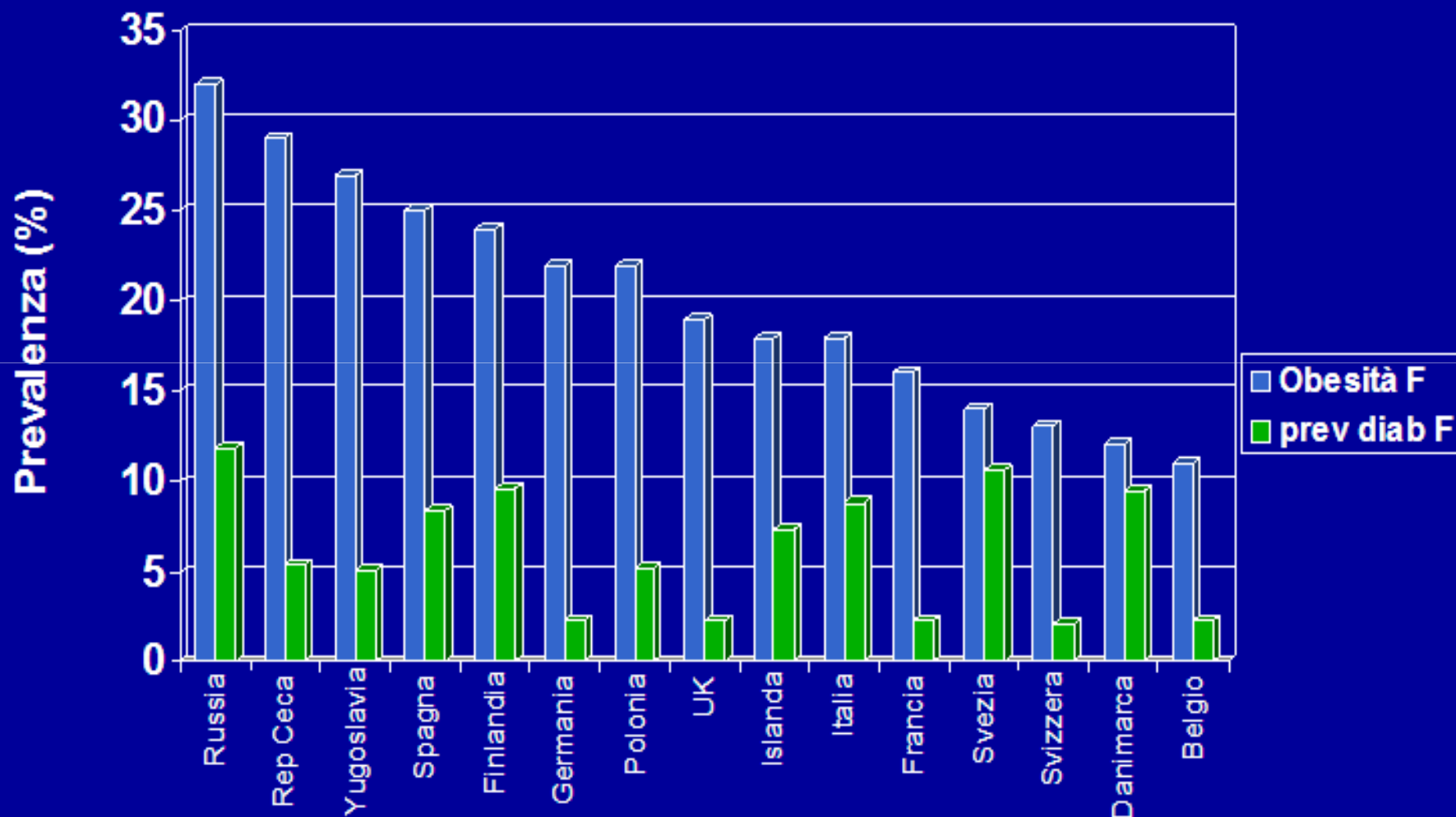


Prevalenza Obesità: 1989-96 MONICA Study; età 35-64 da *JEI* 25: 816-822; 2002

Prevalenza Diabete: 1995; età >20aa da *Diabetes Care* 21: 1414-1431; 1998

Diabesità: prevalenza

Europa – femmine adulte



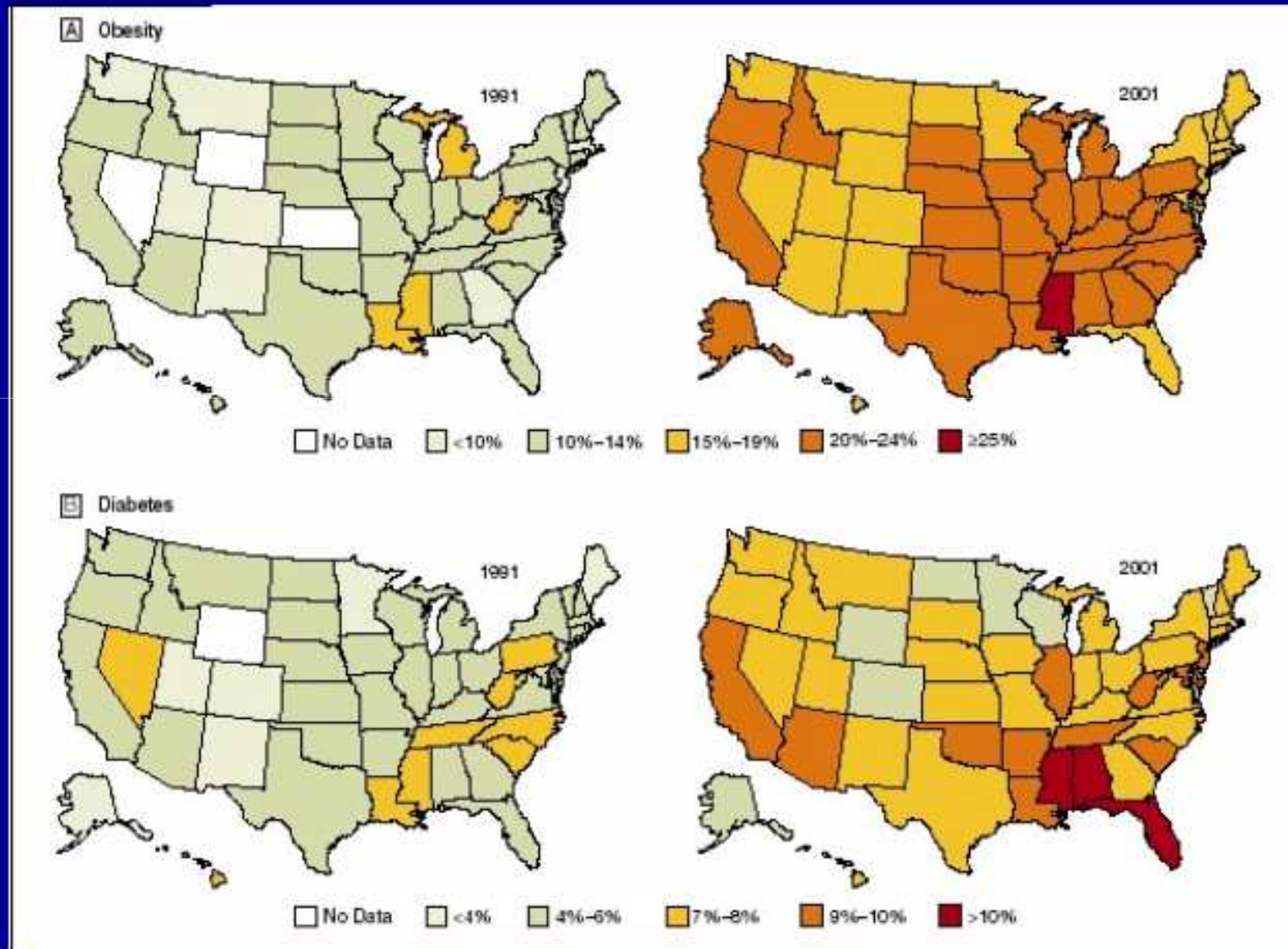
Prevalenza Obesità: 1989-96 MONICA Study; età 35-64 da *JEI* 25: 816-822; 2002

Prevalenza Diabete: 1995 età >20aa da *Diabetes Care* 21: 1414-1431; 1998

Diabesità – Trend temporale USA adulti

(1991 - 2001)

diabetici >15 mil -> 22 mil nel 2025, >60 mil IR: 1\4 futuri DM



NHANES* III
Prev DM+AGT
=14%
Prev MS
=24% (1età)

*National
Health and
Nutrition
Examination
Surveys



International Diabetes Federation

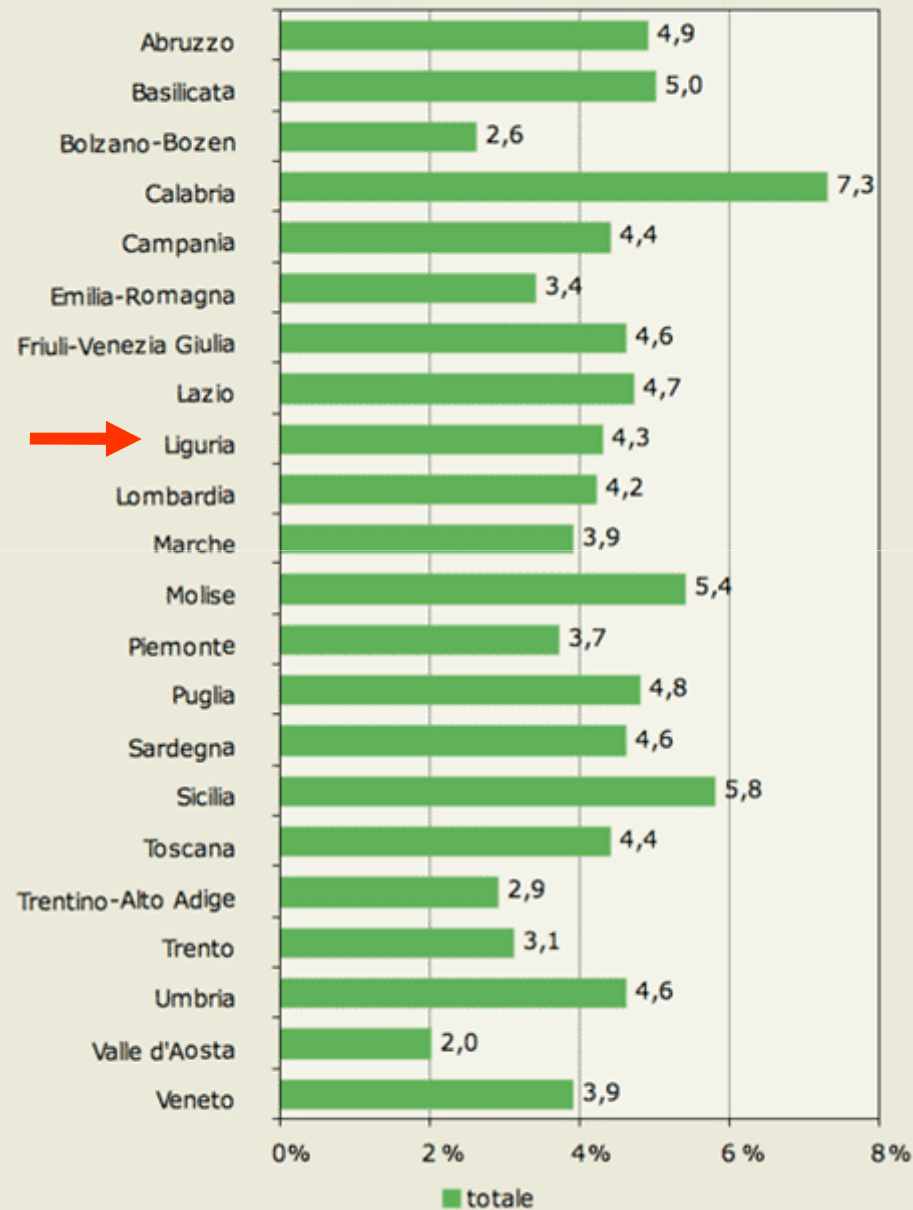
International Diabetes Federation

PRESS RELEASE

Embargoed until 4 December 2006
Cape Town, South Africa

Diabetes epidemic out of control

Prevalenza del diabete nelle regioni italiane

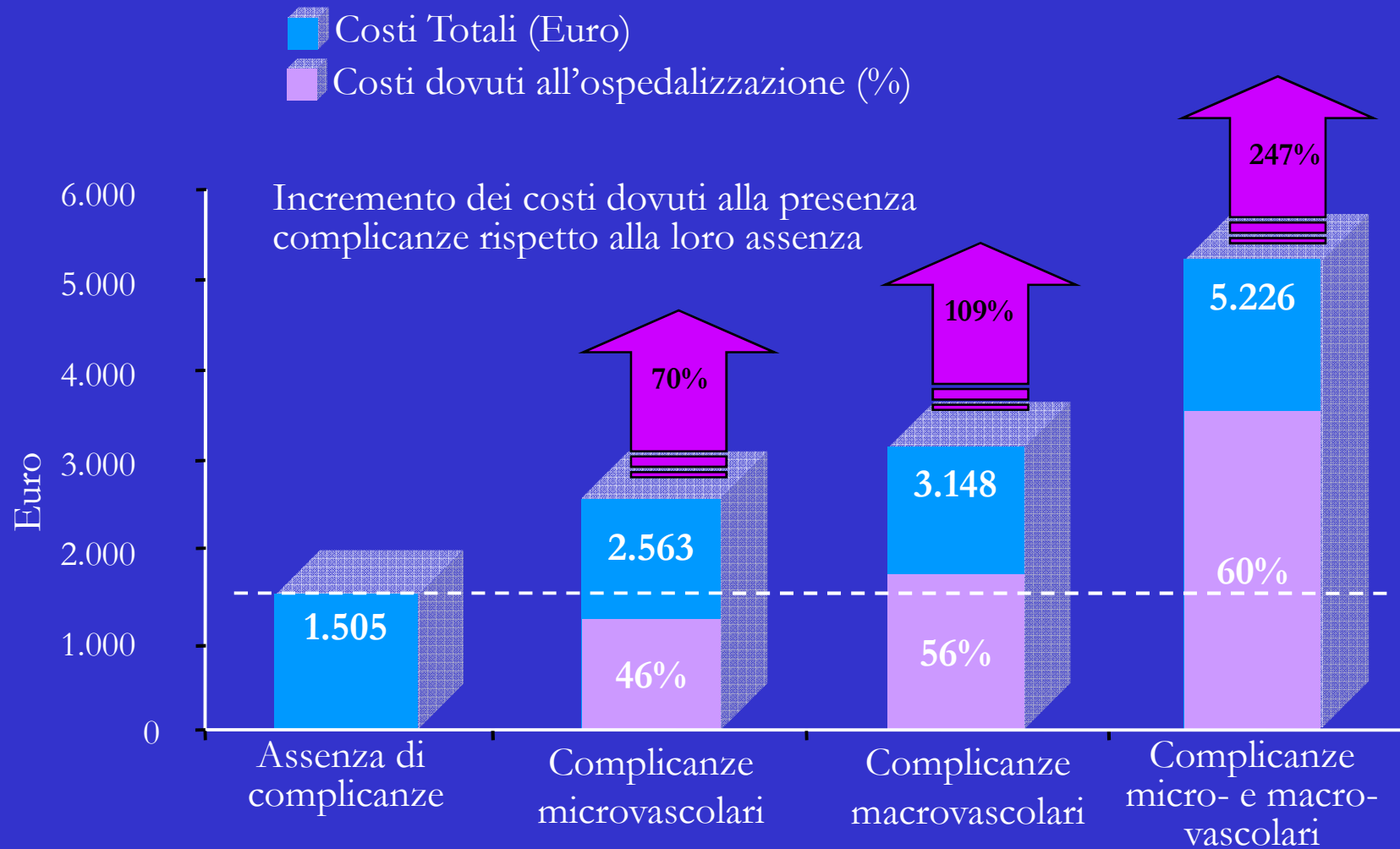


Asl 3 Genovese

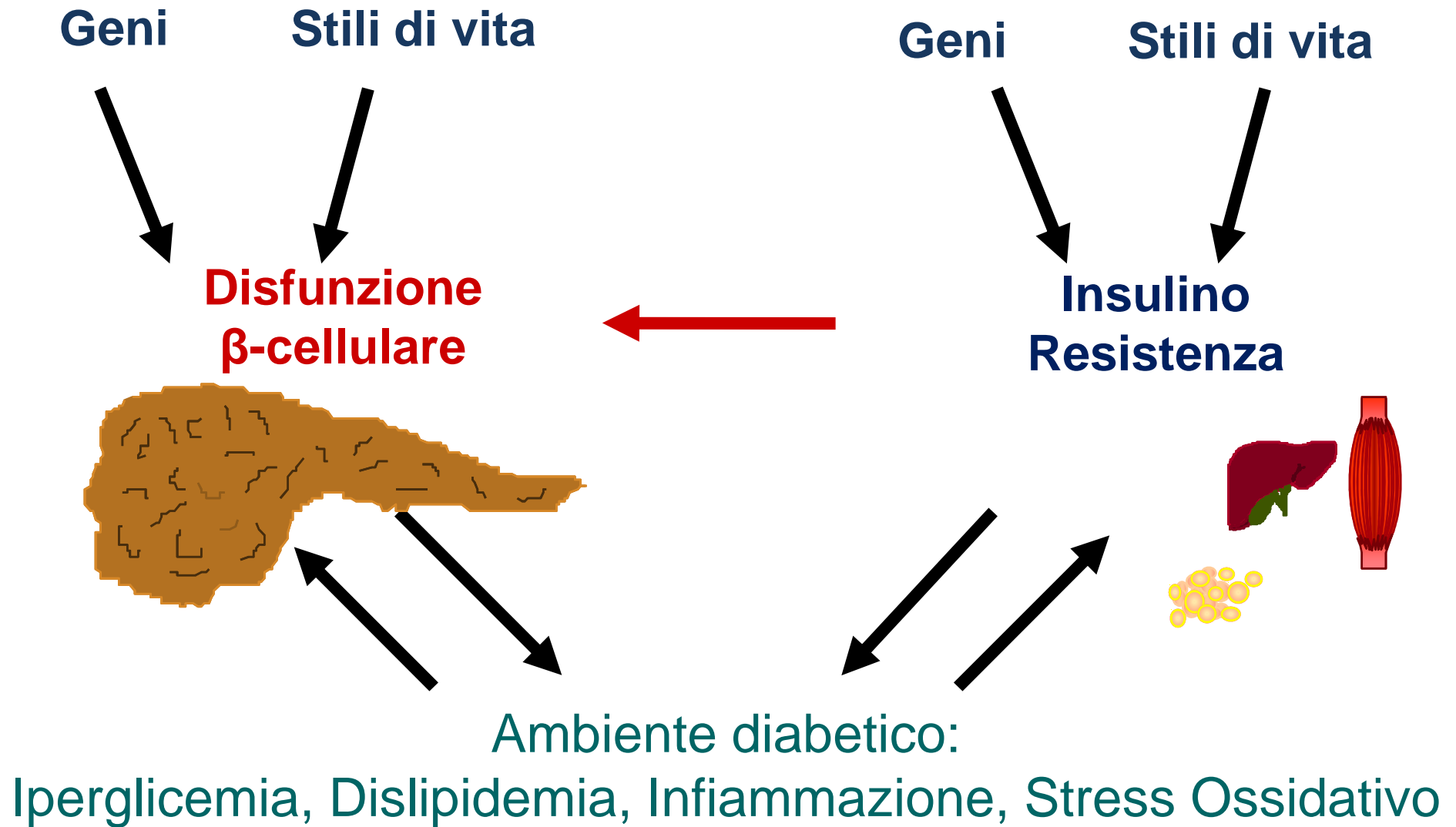
6,2 % esenti ticket



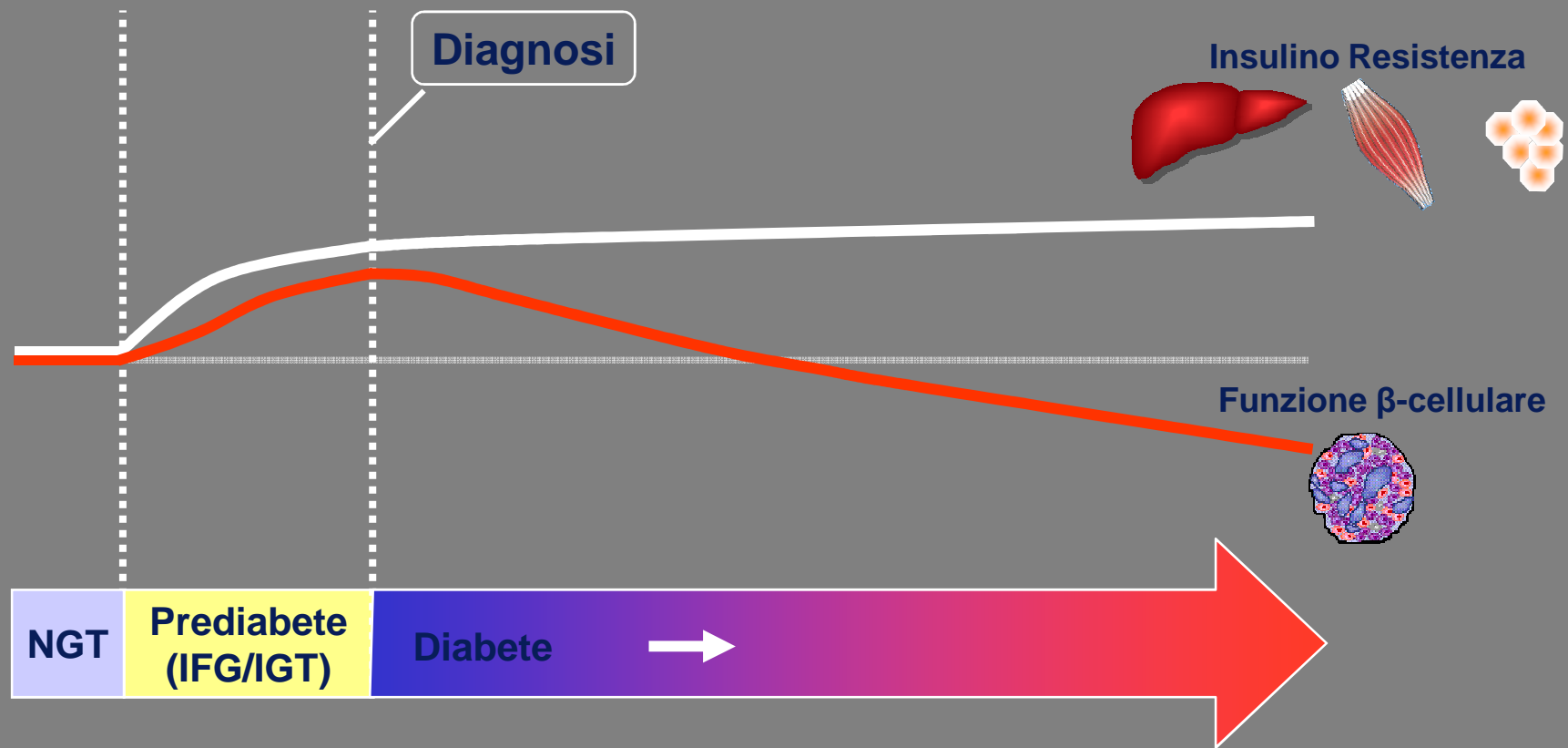
L'impatto economico-sanitario del diabete mellito di tipo 2



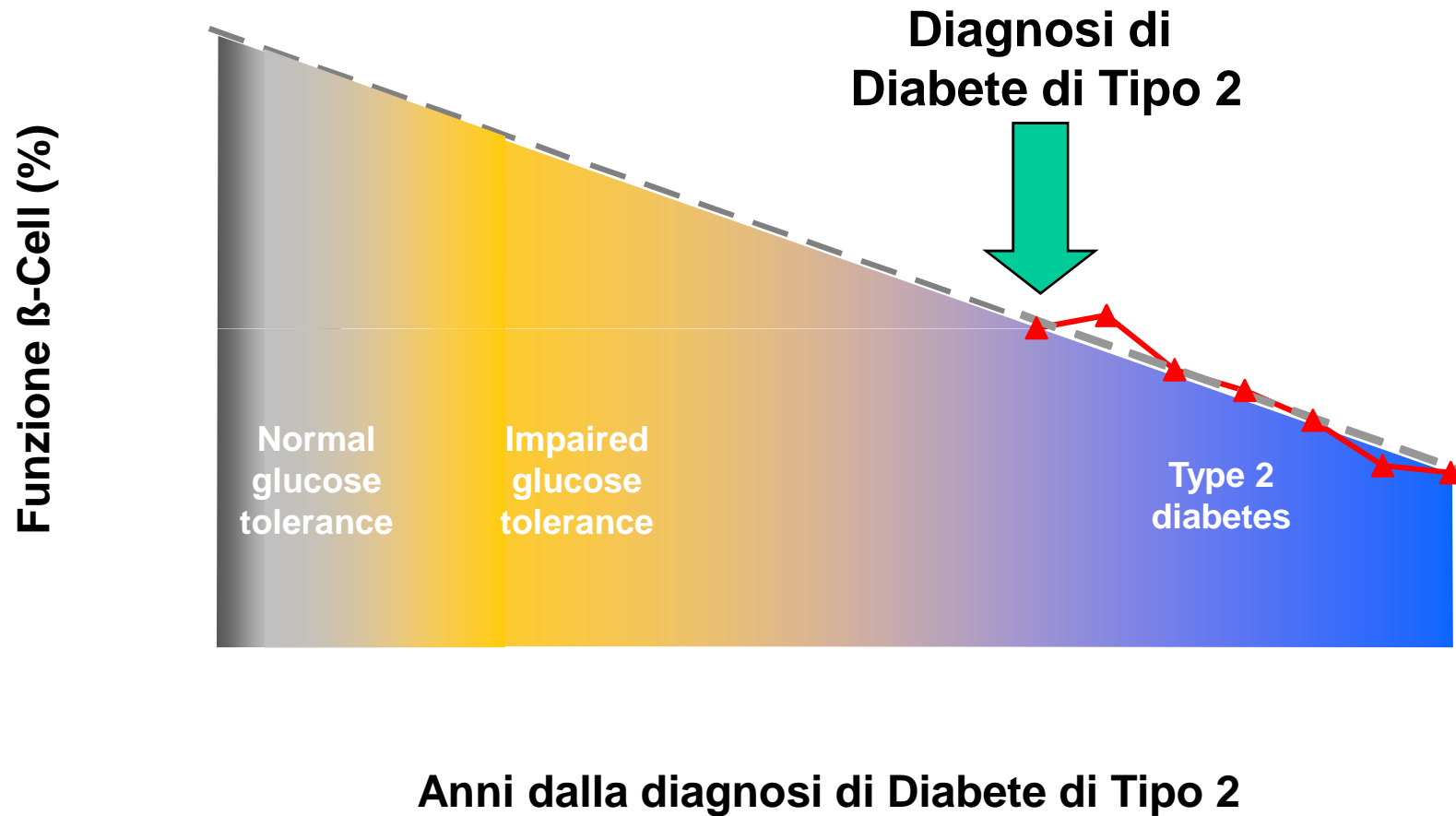
Diabete di tipo 2: una malattia multifattoriale



Storia naturale del diabete di tipo 2: il progressivo declino della funzione β -cellulare in presenza di una stabile insulino resistenza come elemento determinante dell'evoluzione

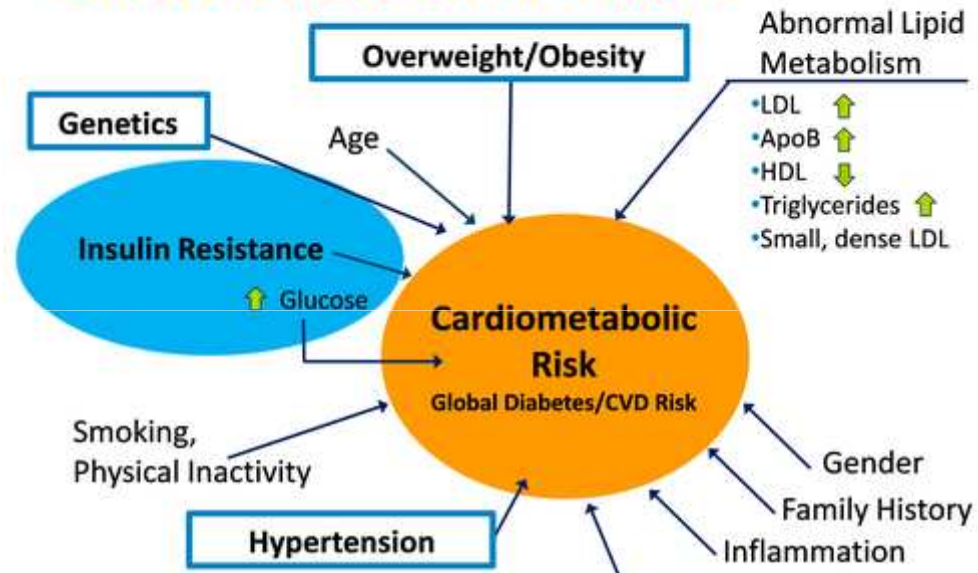


Il compenso glicemico peggiora man mano che la funzione beta-cellulare si riduce



Adapted from UK Prospective Diabetes Study Group (UKPDS 16). *Diabetes*. 1995;44:1249-1258.

Cardiometabolic Risk Factors

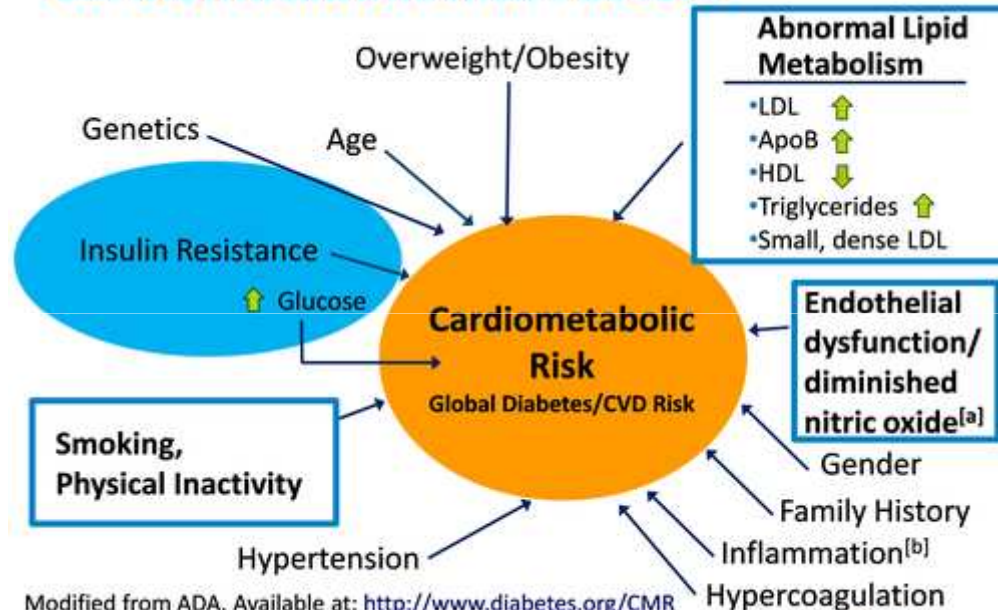


ApoB = apolipoprotein B; CVD = cardiovascular disease; HDL = high-density lipoprotein; LDL = low-density lipoprotein

Modified from ADA. Available at: <http://www.diabetes.org/CMR>



Cardiometabolic Risk Factors



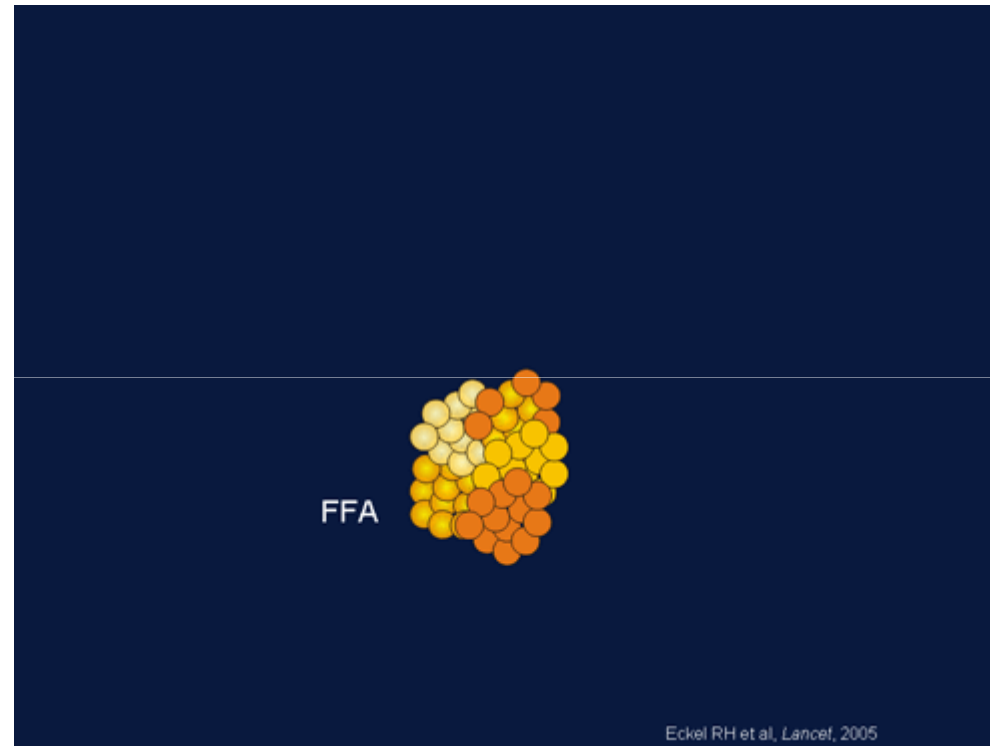
Modified from ADA. Available at: <http://www.diabetes.org/CMR>

a. Hadi HA, et al. *Vasc Health Risk Manag.* 2005;1:183-198.

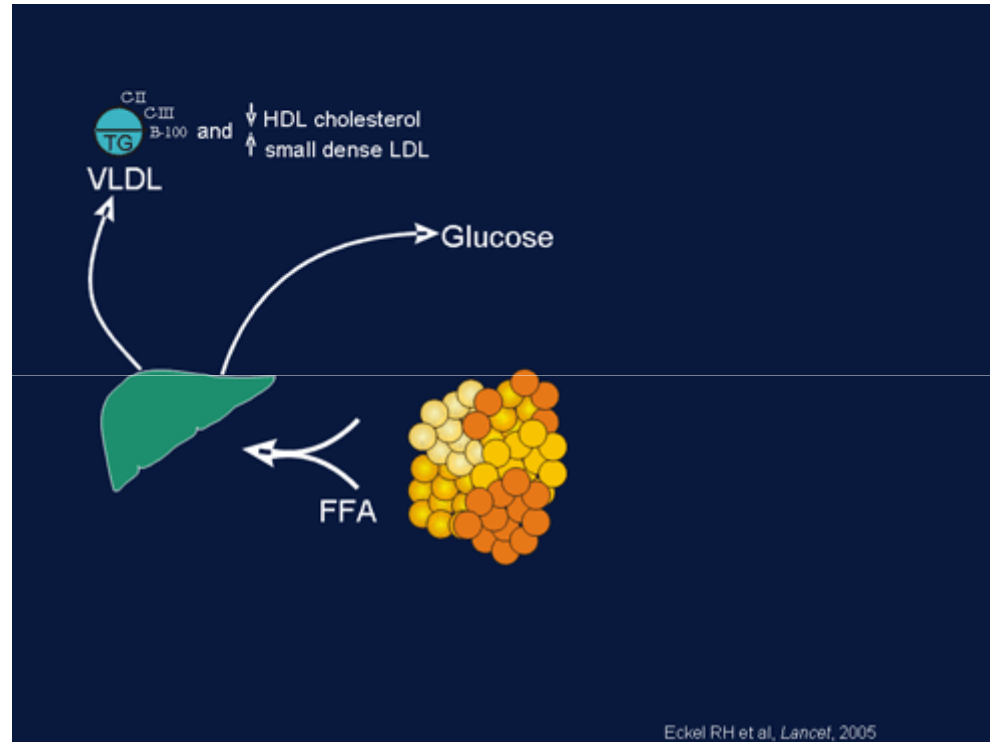
b. Willerson JT, Ridker PM. *Circulation.* 2004;109(21 Suppl 1):II2-II10.

Medscape
EDUCATION

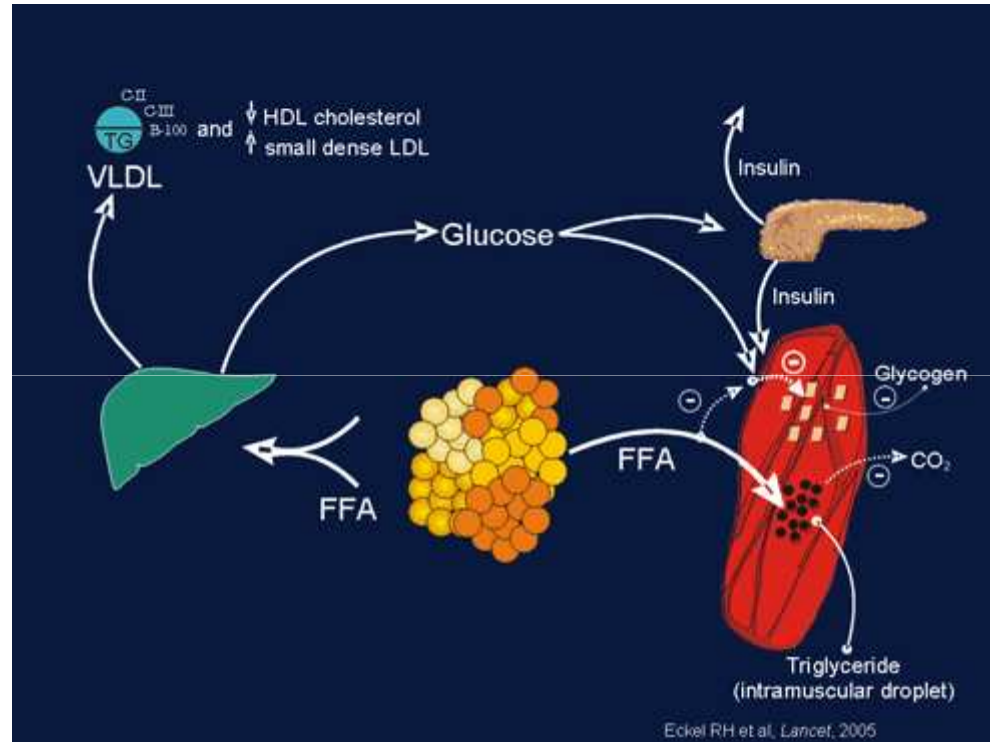
Obesità e Diabete



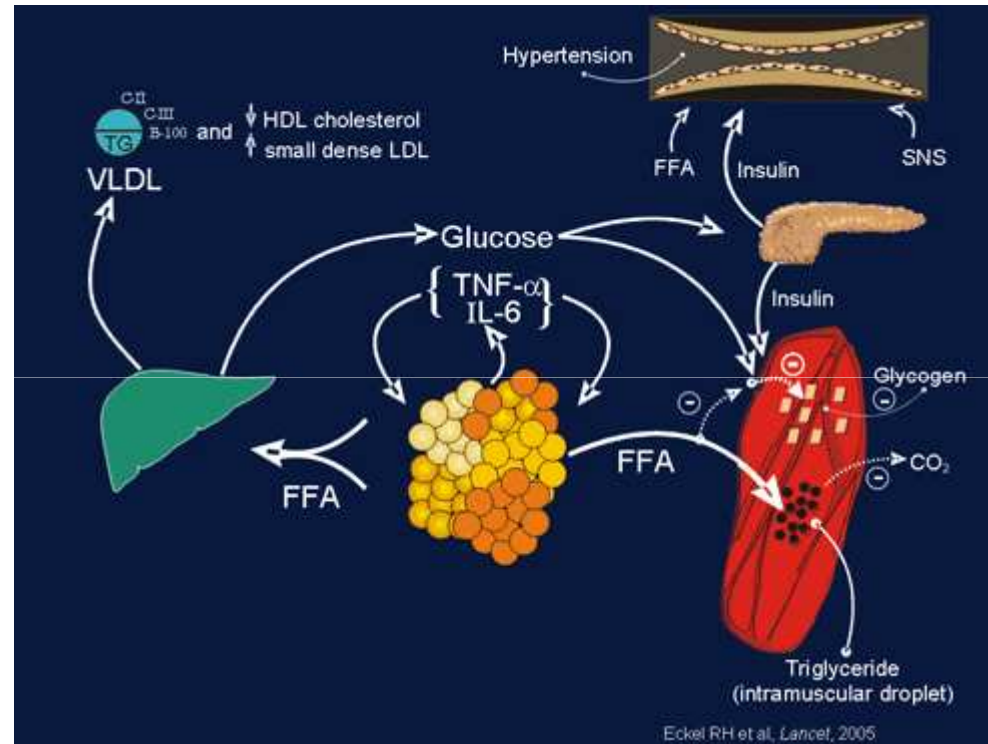
Obesità e Diabete



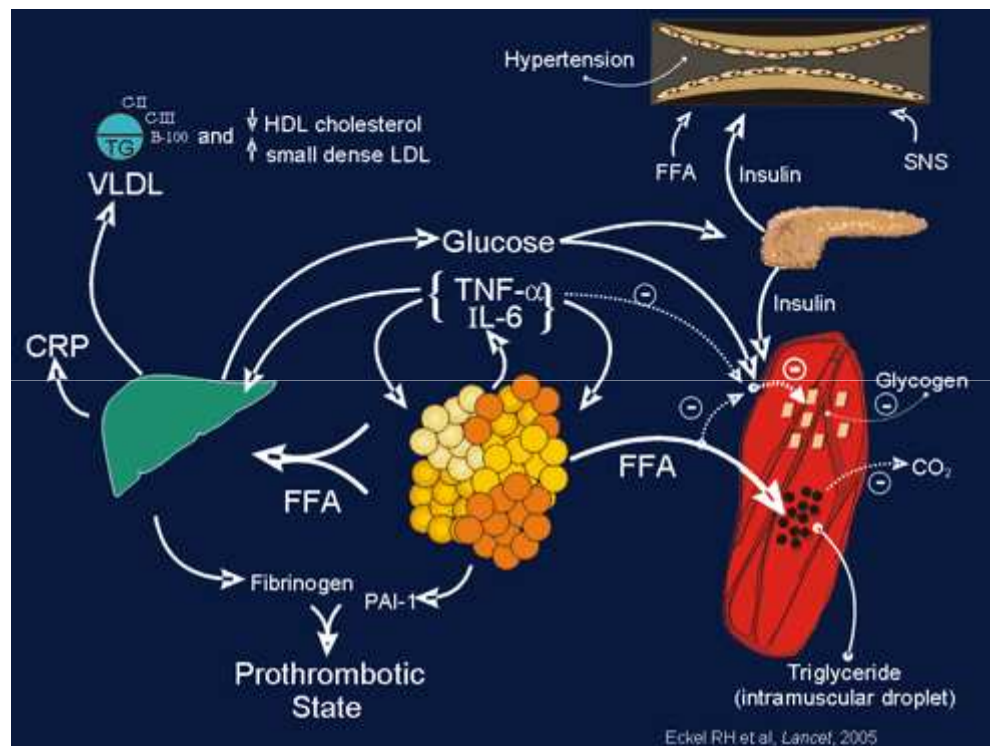
Obesità e Diabete



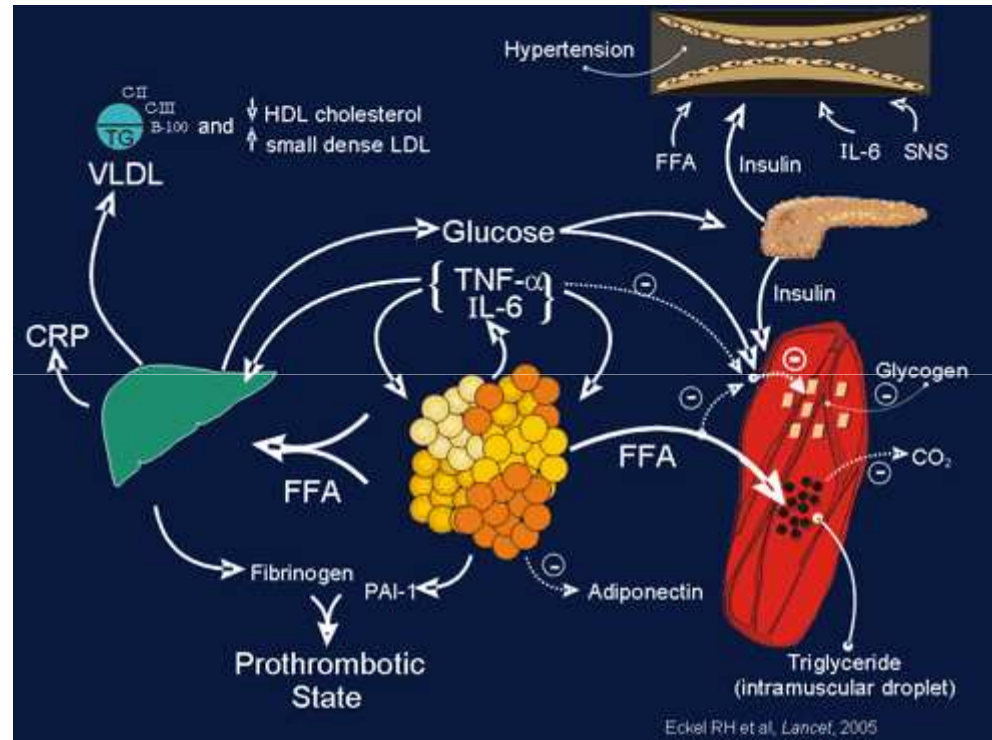
Obesità e Diabete



Obesità e Diabete



Obesità e Diabete



Intervento sugli stili di vita ed efficacia nel corso della storia naturale del diabete di tipo 2: prevenzione

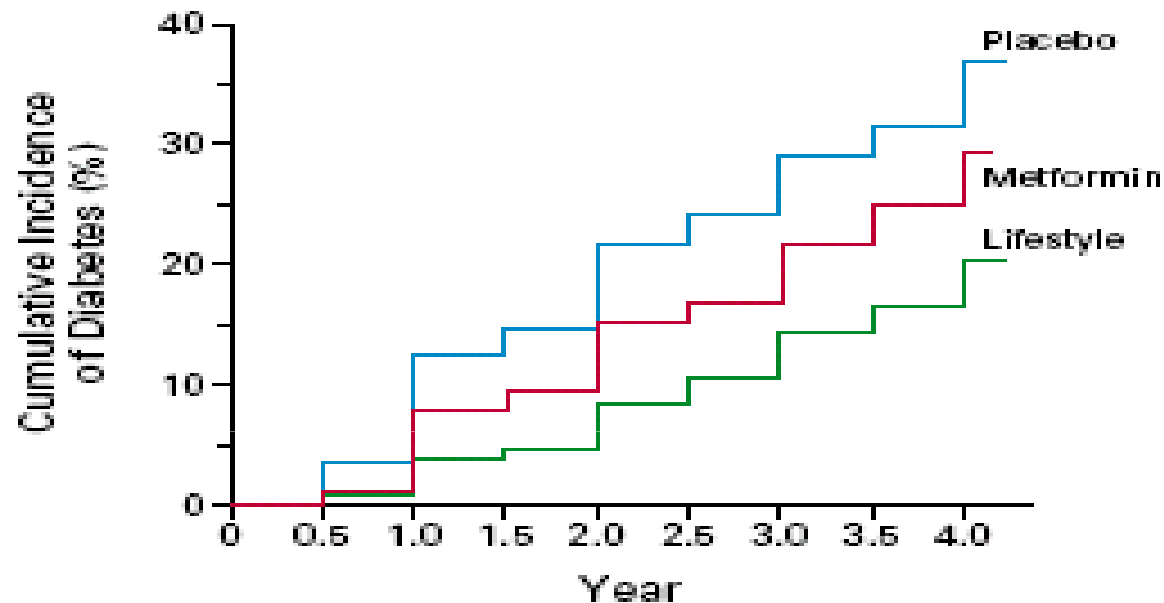


Figure 2. Cumulative Incidence of Diabetes According to Study Group.

The diagnosis of diabetes was based on the criteria of the American Diabetes Association.¹¹ The incidence of diabetes differed significantly among the three groups ($P < 0.001$ for each comparison).

L'intervento sugli stili di vita è più efficace del trattamento con metformina nella prevenzione del diabete di tipo 2

DPP Research Group, N Engl J Med 2002; 346:393- 403

Intervento sugli stili di vita: trattamento del diabete

BMJ

2010 Jul 20;341:

RESEARCH

Nutritional intervention in patients with type 2 diabetes who are hyperglycaemic despite optimised drug treatment—

Measures	Intervention (n=45)		Control (n=48)		Difference* (95% CI)	P value*
	Baseline	6 months	Baseline	6 months		
HbA _{1c} (%)	8.9 (1.4)	8.4 (1.0)	8.6 (1.3)	8.6 (1.2)	-0.4 (-0.7 to -0.1)	0.007
Glucose (mmol/l)	9.0 (2.6)	8.1 (2.2)	8.3 (2.4)	8.3 (2.9)	-0.6 (-1.5 to 0.3)	0.181
Weight (kg)	98.4 (18.7)	96.3 (18.0)	95.1 (18.8)	94.5 (18.3)	-1.3 (-2.4 to -0.1)	0.032
Body mass index†	35.1 (6.1)	34.3 (5.8)	34.2 (6.0)	34.0 (5.9)	-0.5 (-0.9 to -0.1)	0.026
Waist circumference (cm)	111.4 (13.7)	108.9 (13.6)	108.0 (12.8)	107.4 (12.7)	-1.6 (-2.7 to -0.5)	0.005
Systolic blood pressure (mm Hg)	131.9 (15.8)	127.8 (15.6)	131.7 (16.1)	129.2 (16.4)	-1.4 (-6.1 to 3.2)	0.536
Diastolic blood pressure (mm Hg)	79.8 (9.0)	76.5 (8.7)	79.0 (10.3)	76.4 (10.6)	-0.5 (-3.0 to 2.0)	0.673
Total cholesterol (mmol/l)	4.35 (0.93)	4.11 (0.97)	3.93 (0.84)	3.87 (0.94)	-0.14 (-0.38 to 0.10)	0.248
HDL cholesterol (mmol/l)	1.04 (0.22)	1.04 (0.25)	1.03 (0.22)	1.01 (0.24)	0.01 (-0.04 to 0.05)	0.747
LDL cholesterol (mmol/l)	2.52 (0.83)	2.30 (0.82)	2.16 (0.71)	2.13 (0.80)	-0.15 (-0.35 to 0.06)	0.162
Triglycerides (mmol/l)	1.71 (0.83)	1.67 (1.04)	1.61 (0.65)	1.59 (0.68)	0.01 (-0.26 to 0.28)	0.933
Uric acid (µmol/l)	302.1 (78.9)	313.3 (81.5)	316.2 (74.0)	315.9 (79.5)	11.0 (-3.7 to 25.6)	0.140
Urine albumin:creatinine ratio‡	7.5 (24.6)	7.1 (23.8)	11.0 (53.1)	5.6 (22.2)	3.4 (-0.5 to 7.4)	0.089

Coppell KJ BMJ. 2010 Jul 20; 341 : c3337

Risultati ottenibili con misure igienico- dietetiche

Benefici del decremento ponderale (2- 9 kg)

- Riduzione dei fattori di rischio:
 - Riduzione p.a.: 5- 20 mm Hg/ 10 kg
 - Riduzione colesterolo LDL 10- 15%
- Riduzione della mortalità totale (16- 65%) (*Chaturvedi 1995, Eriksson 1998*)

Benefici della cessazione del fumo

- Nel post infarto: O.R. mortalità 0.54 (0.46- 0.62) (*Wilson 2000*)

Benefici dell'esercizio fisico

moderato (20' - 30' al dì o a gg alterni)

- Riduzione dei fattori di rischio:
 - Aumento HDL
 - Riduzione p.a.
 - Riduzione insulino- resistenza
- Riduzione della patologia coronarica del 35-55% (*Manson 1992, Lakka 1994*)
- Riduzione della mortalità cv (31%) e totale (29%) (*Bijnen 1998*)

Benefici della dieta iposodica:

- Riduzione p.a. 8.9/ 4.5 mm Hg (*Sacks FM, NEJM 2001*)

Stile di vita migliora “l’effetto del farmaco”

Incidence of New-Onset Diabetes (95% CI) Per 100 Person-Years in the DPP and DPPOS Studies, and During 10-Year Combined Follow-up

Study period	Lifestyle intervention, n=910	Metformin, n=924	DPP placebo, n=932
DPP	4.8 (4.1-5.7)	7.8 (6.8-8.8)	11.0 (9.8-12.3)
DPPOS	5.9 (5.1-6.8)	4.9 (4.2-5.7)	5.6 (4.8-6.5)
DPP + DPPOS	5.3 (4.8-5.8)	6.4 (5.9-7.1)	7.8 (7.2-8.6)

DPP=Diabetes Prevention Program; DPPOS=Diabetes Prevention Program Outcomes Study

Validation of a Counseling Strategy to Promote the Adoption and the Maintenance of Physical Activity by Type 2 Diabetic Subjects

CHIARA DI LORETO, MD
CARMINE FANELLI, MD
PAOLA LUCIDI, MD
GIUSEPPE MURDOLO, MD
ARIANNA DE CICCO, MD

NATASCIA PARLANTI, MD
FAUSTO SANTEUSANIO, MD
PAOLO BRUNETTI, MD
PIERPAOLO DE FEO, MD

OBJECTIVE — There is enough evidence that physical activity is an effective therapeutic tool in the management of type 2 diabetes. The present study was designed to validate a counseling strategy that could be used by physicians in their daily outpatient practice to promote the adoption and maintenance of physical activity by type 2 diabetic subjects.

RESEARCH DESIGN AND METHODS — The long-term (2-year) efficacy of the behavioral approach ($n = 182$) was compared with usual care treatment ($n = 158$) in two matched, randomized groups of patients with type 2 diabetes who had been referred to our Outpatient Diabetes Center. The outcome of the intervention was consistent patient achievement of an energy expenditure of >10 metabolic equivalents (METs)-h/week through voluntary physical activity.

RESULTS — After 2 years, 69% of the patients in the intervention group (27.1 ± 2.0 METs \times h/week) and 18% of the control group (4.1 ± 0.8 METs \times h/week) achieved the target ($P < 0.001$) with significant ($P < 0.001$) improvements in BMI (intervention group 28.9 ± 0.2 versus control group 30.4 ± 0.3 kg/m²) and HbA_{1c} (intervention group 7.0 ± 0.1 versus control group $7.6 \pm 0.1\%$).

CONCLUSIONS — This randomized, controlled study shows that physicians can motivate most patients with type 2 diabetes to exercise long-term and emphasizes the value of individual behavioral approaches in daily practice.

Diabetes Care 26:404–408, 2003

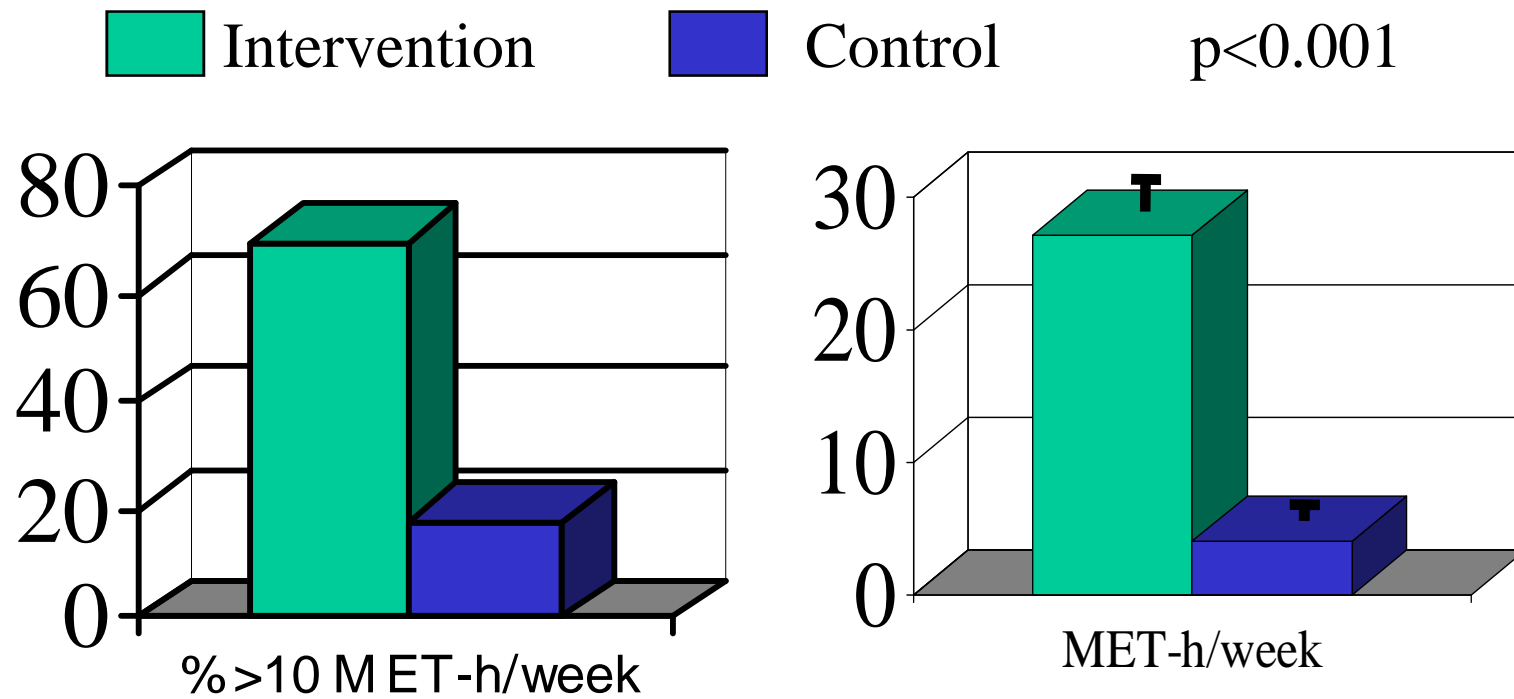
with their recommendations. In fact, adults with diabetes are less likely to engage in regular physical activity than the general adult population (6), and only 23% of older adults with type 2 diabetes reported >60 min of weekly physical activity (7). The fact that people with diabetes have greater concerns with exercise than the general public might explain these negative figures, signifying the importance of proper education.

Regular physical exercise requires more time and effort than modifications to diet and taking medications, and patients often perceive it as a significant and difficult change in their lifestyle. For this reason, there is the need for reproducible interventions that can be used in daily ambulatory practice to motivate diabetic patients to regularly practice physical activity. In 1996, the U.S. Department of Health and Human Services reviewed all the interventions facilitating participation in physical activity (8), and consequently, we designed individualized counseling strategies based on the approaches that this panel of experts showed to be most effective.

To validate the long-term (2-year) efficacy of our intervention, we compared

C. Di Loreto et al. Diabetes Care 26:404, 2003

RESULTS (2 YEARS)



C. Di Loreto et al. Diabetes Care 26:404, 2003

	0	1-10	11-20	21-30	31-40	> 40
BW Kg	+ 0.8	+ 0.6	+ 0.1	- 2.2	- 3.0	- 3.2
Waist cm	+ 1.0	+ 1.0	- 0.9	- 3.8	- 5.5	- 7.1
HBA1c %	+ 0.03	- 0.06	- 0.44	- 0.88	- 1.11	- 1.19
BP max mmHg	- 1.8	- 1.5	- 6.4	- 5.5	- 6.6	- 9.2
BP min mmHg	- 4.6	- 2.4	- 2.9	- 4.8	- 5.3	- 7.1
Tot CHOL mg%	- 3.8	- 5.6	- 10.2	- 10.7	- 7.4	- 10.9
LDL CHOL	- 4.5	- 7.1	- 3.4	- 5.3	- 6.3	- 7.7
HDL CHOL	+ 0.1	+ 1.1	+ 2.9	+ 5.6	+ 10.4	+ 6.3
TG mg%	+ 3.4	+ 2.1	- 48.2	- 55.2	- 57.4	- 68.4
CHD %	+ 0.1	- 0.3	- 2.6	- 3.7	- 4.8	- 4.3

Di Loreto et al. *Diabetes Care* 28: 1295, 2005

p<0.05

COSTS

€ per capita/year

	p<0.01	p<0.01	0	1-10	11-20	21-30	31-40	> 40
NHS + SOCIAL		896	243	-418	-1572	-2059	-2241	

Di Loreto et al. *Diabetes Care* 28: 1295, 2005

Diabetes Preventio Program sostenibilità economica

Intervento	Incidenza DM	Costi punto di vista sistema sanitario (\$)	Costo per QALY
Metformina	- 31%	2.191	31.300
Stile di vita	-58%	2.269	11.000

The Cost-Effectiveness of Lifestyle Modification or Metformin in Preventing Type 2 Diabetes in Adults with Impaired Glucose Tolerance

William H. Herman, MD, MPH; Thomas J. Hoerger, PhD; Michael Brandle, MD, MS; Katherine Hicks, MS; Stephen Sorensen, PhD; Ping Zhang, PhD; Richard F. Hamman, MD, DrPH; Ronald T. Ackermann, MD, MPH; Michael M. Engelgau, MD, MS; and Robert E. Ratner, MD, for the Diabetes Prevention Program Research Group*

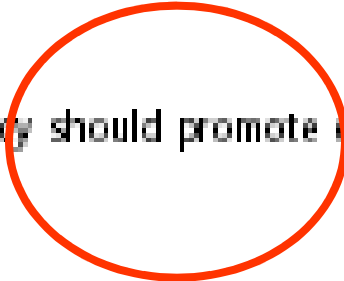
Ann Intern Med. 2005;142:323-332.

Background: The Diabetes Prevention Program (DPP) demonstrated that interventions can delay or prevent the development of type 2 diabetes.

Objective: To estimate the lifetime cost-utility of the DPP interventions.

— .

Conclusions: Health policy should promote diabetes prevention in high-risk individuals.



Clinical Outcomes and Cost-Effectiveness of Strategies for Managing People at High Risk for Diabetes

David M. Eddy, MD, PhD; Leonard Schlessinger, PhD; and Richard Kahn, PhD

Ann Intern Med. 2005;143:251-264.

Objective: To estimate the effects of the lifestyle modification program used in the Diabetes Prevention Program (DPP) on health and economic outcomes.

Conclusions: Lifestyle modification is likely to have important effects on the morbidity and mortality of diabetes and should be recommended to all high-risk people. The program used in the DPP study may be too expensive for health plans or a national program to implement. Less expensive methods are needed to achieve the degree of weight loss seen in the DPP.

conclusioni

- Il diabete è una malattia ad alta prevalenza
- È caratterizzata da alti costi umani ed economici
- La sua cura non sarà presto sostenibile da nessun sistema sanitario
- La prevenzione delle complicanze e della malattia stessa rappresenta l'unica arma

conclusioni

- La prevenzione è molto costosa
- Va indirizzata specialmente sulle popolazioni ad alto rischio
- Vanno cercate strategie di popolazione opportunistiche ed economiche
- Interventi legislativi extrasanitari sono necessari