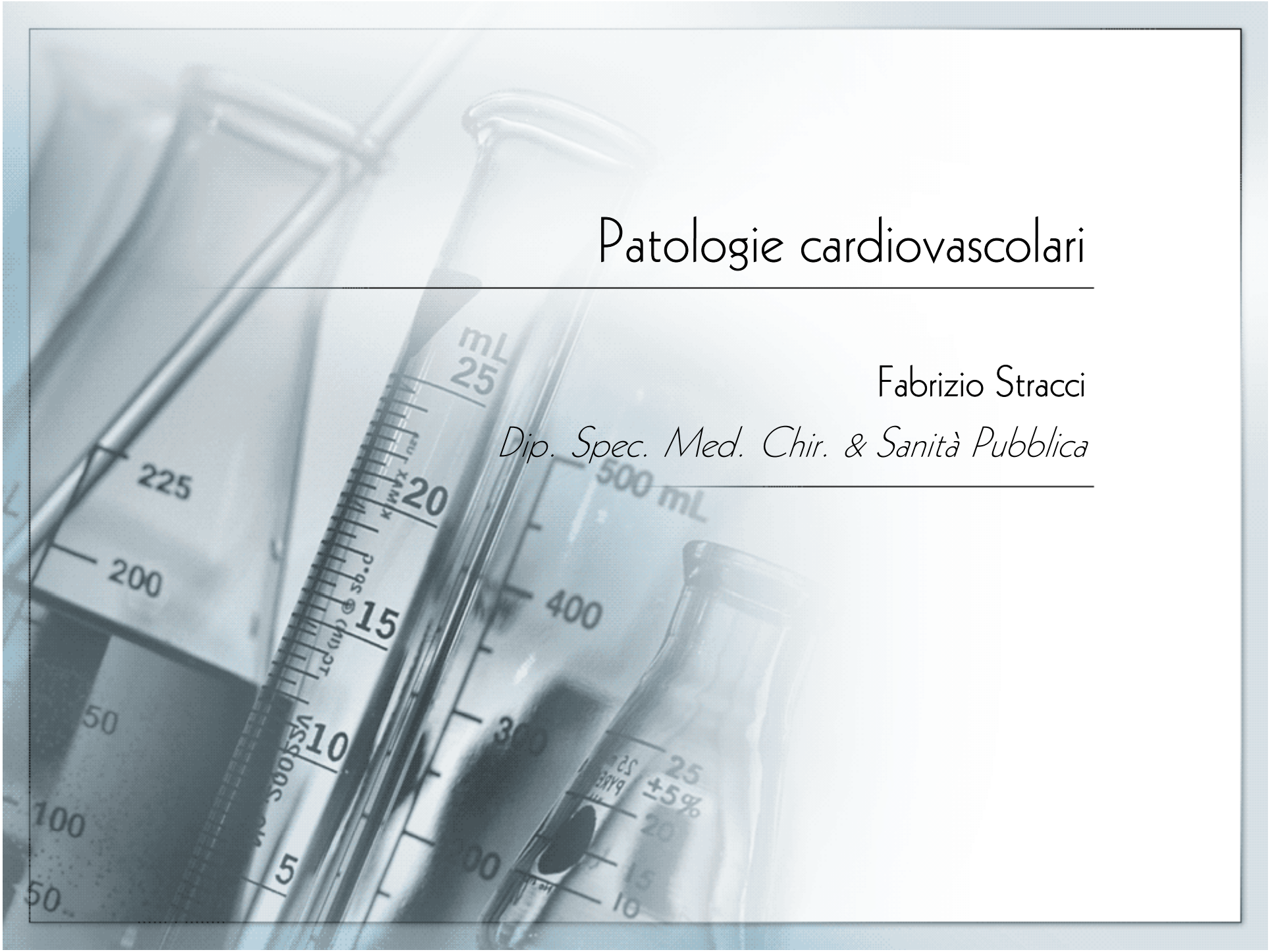


Patologie cardiovascolari

Fabrizio Stracci

Dip. Spec. Med. Chir. & Sanità Pubblica

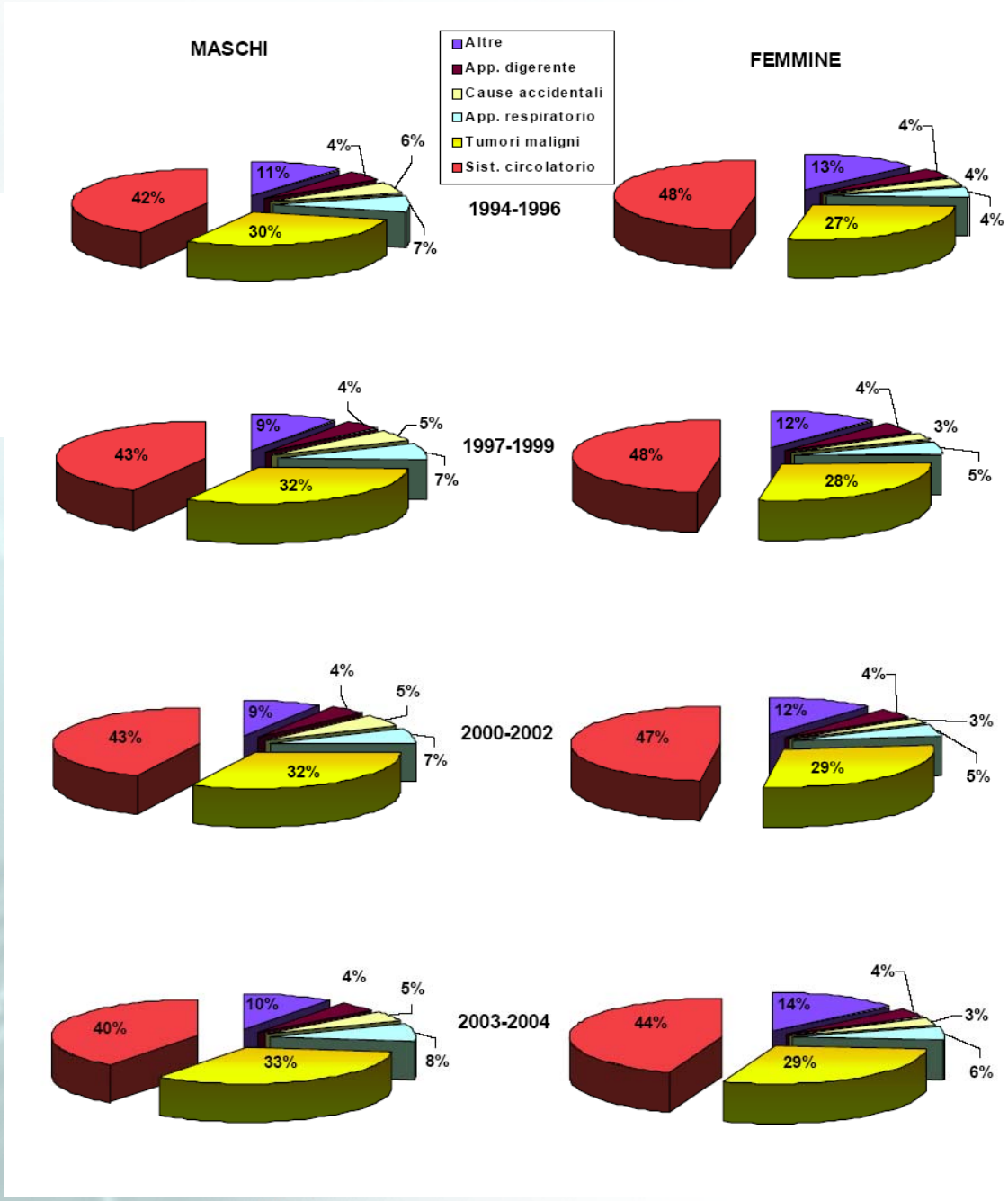
Costituiscono le principali cause di morte

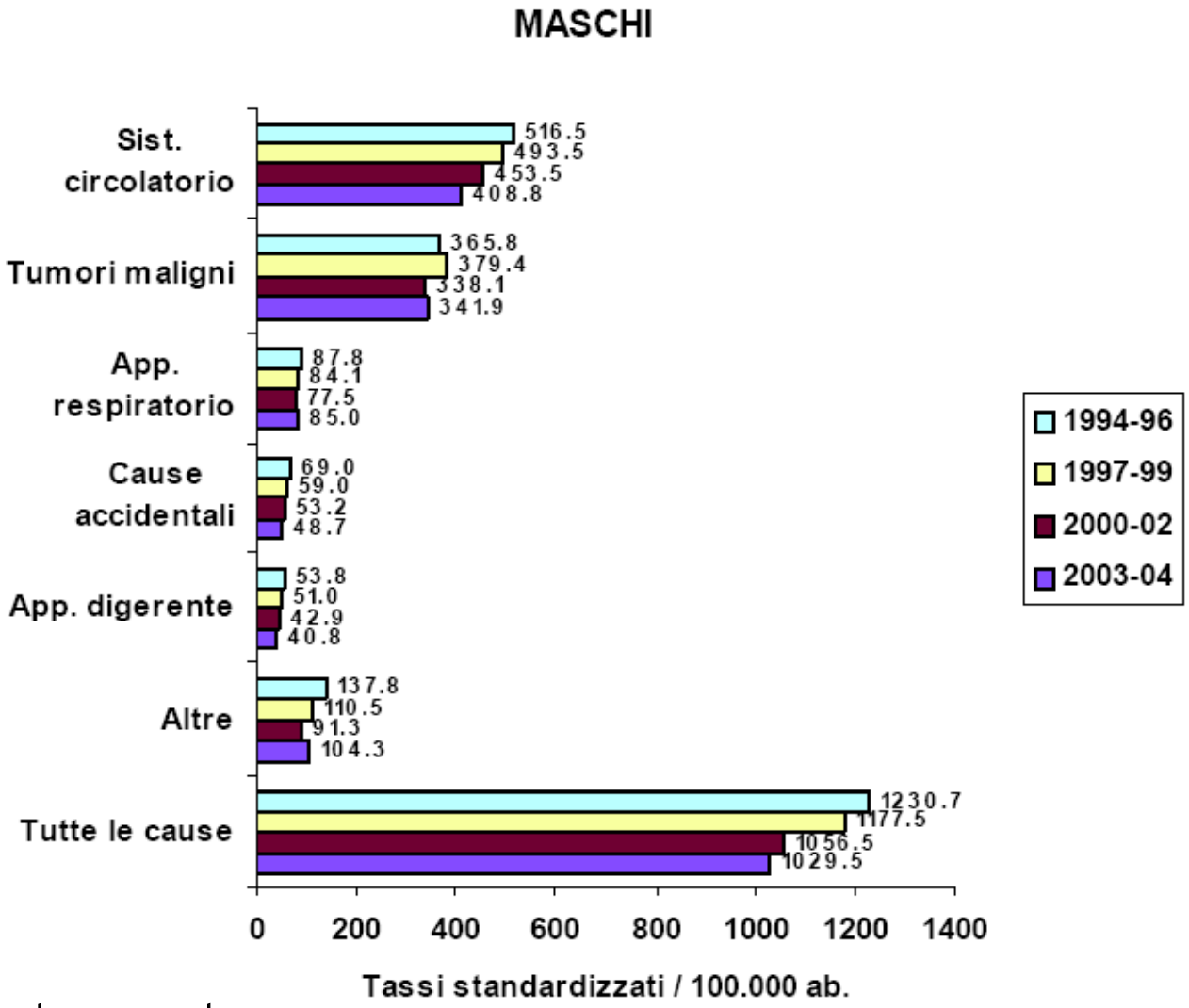
Patologia coronarica

Ictus

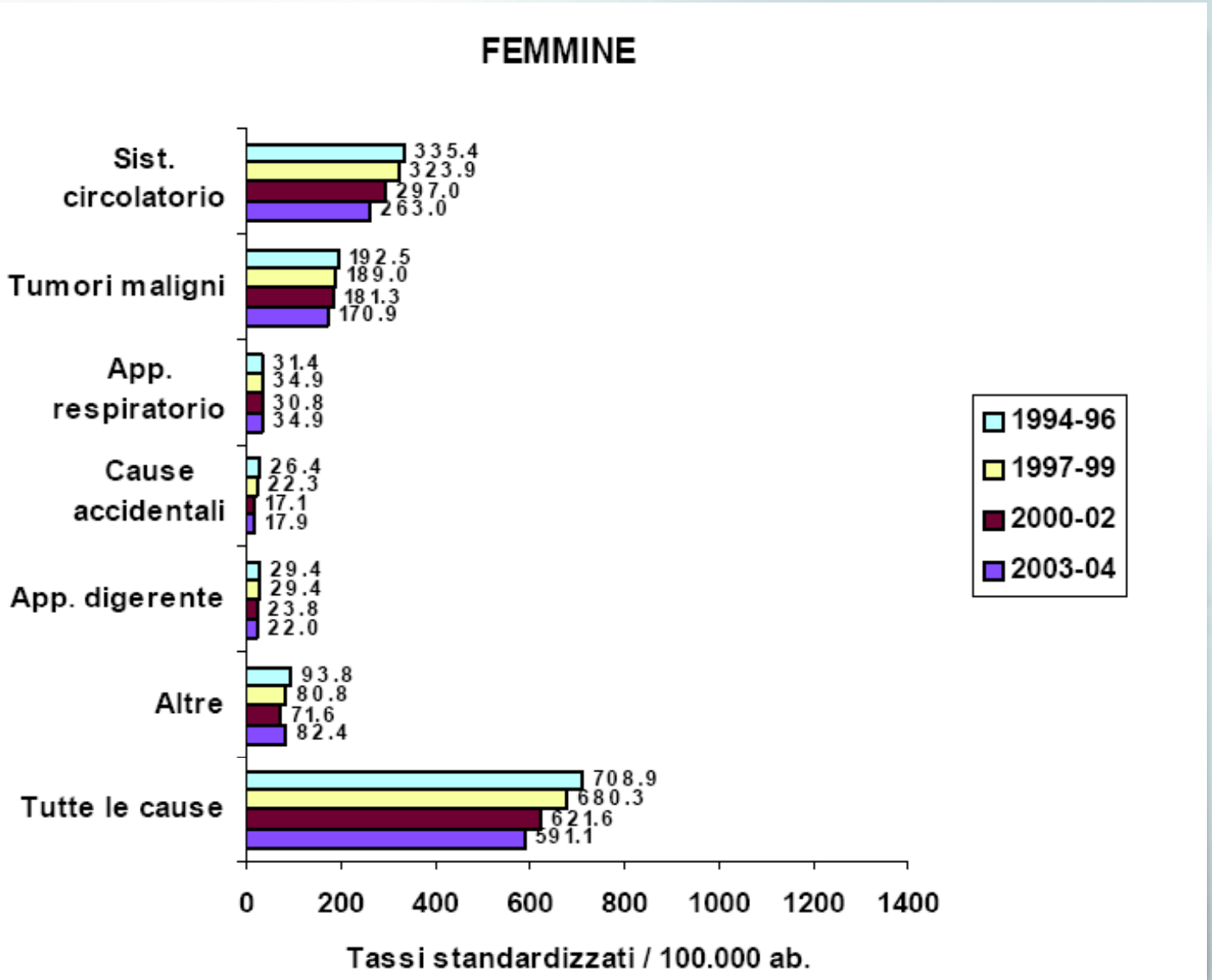
The World Health Organization attributes 30% of all global deaths (i.e. 15.3 million) as well as 10.3% of the total DALYs lost in 1998 to CVD

Mortalità proporzionale in Umbria per periodo

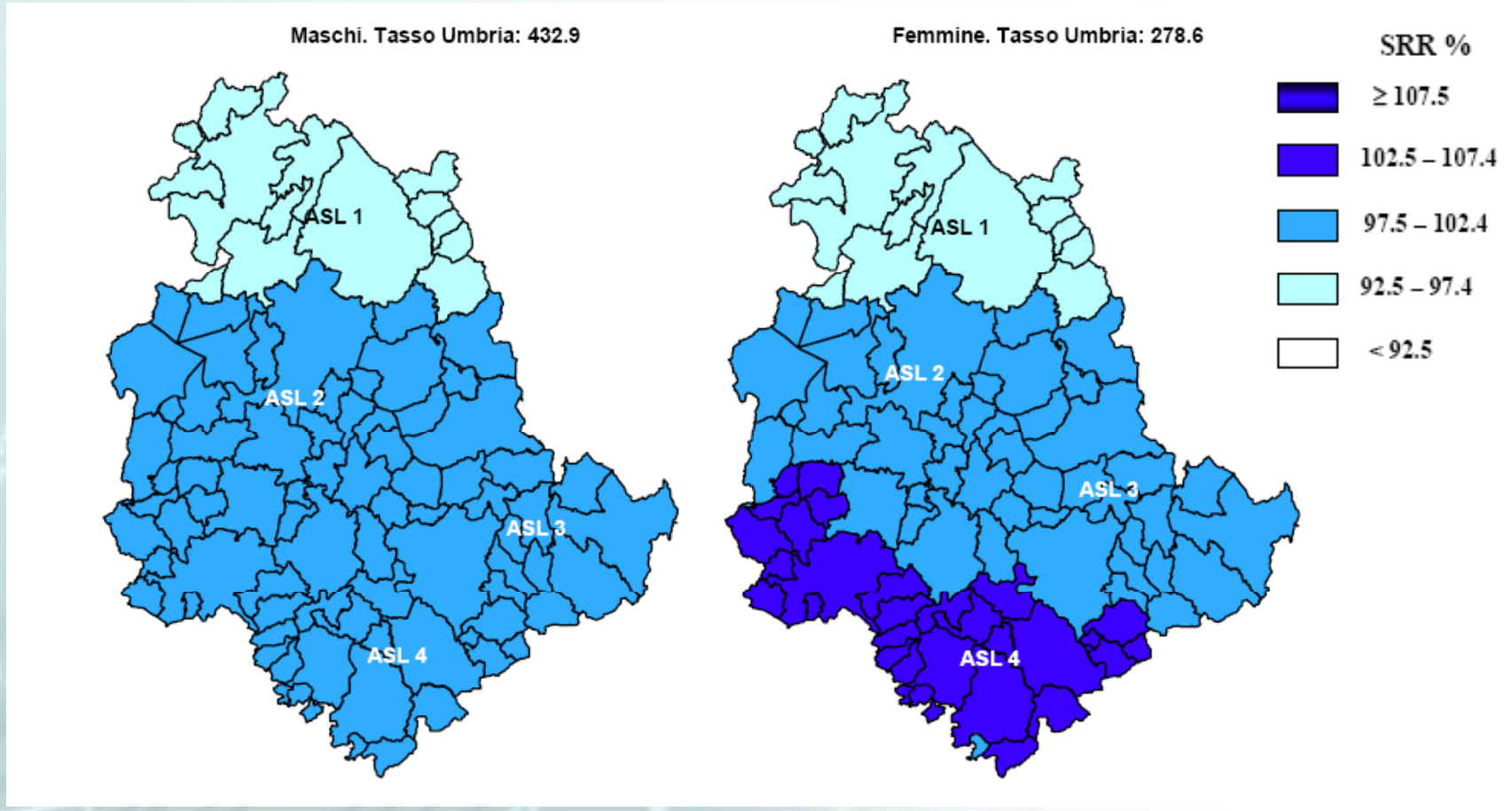


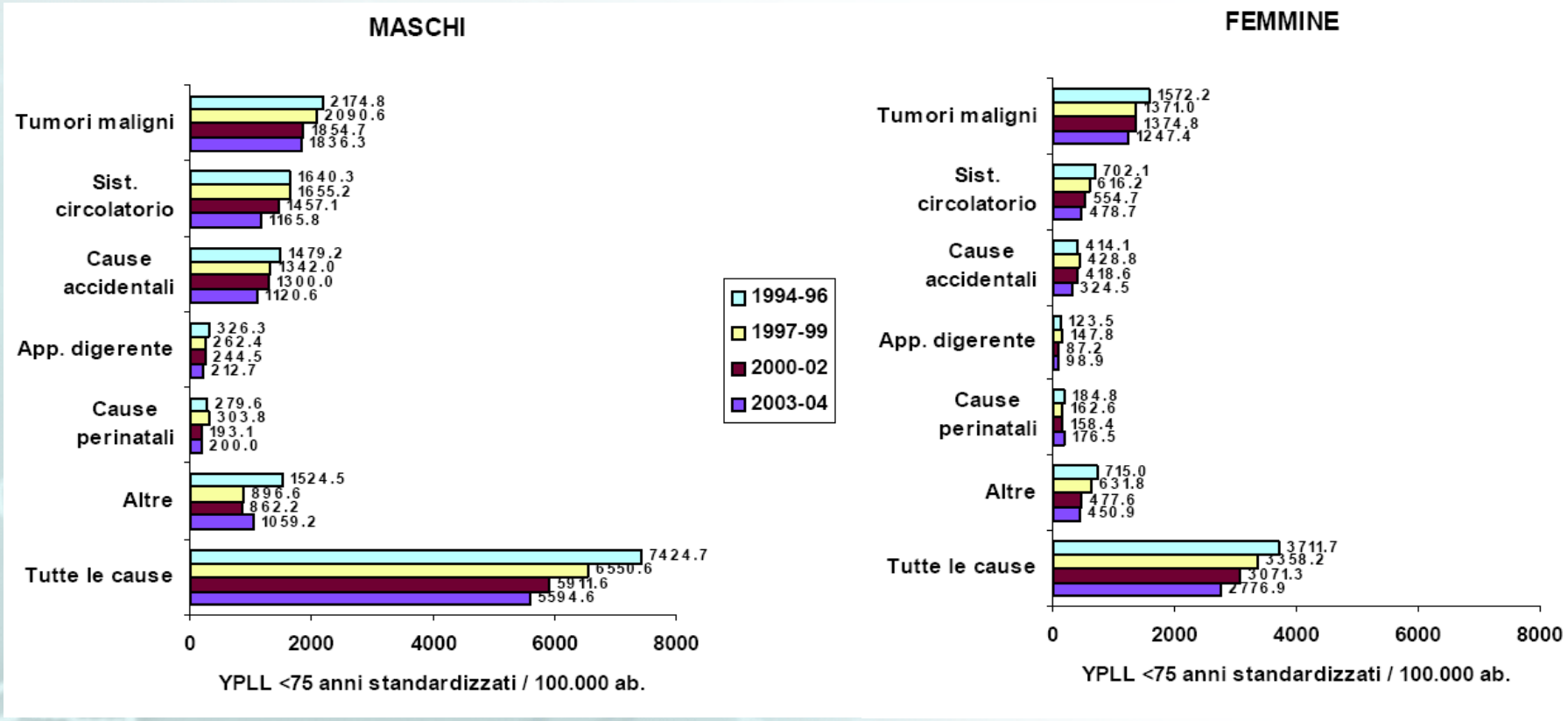


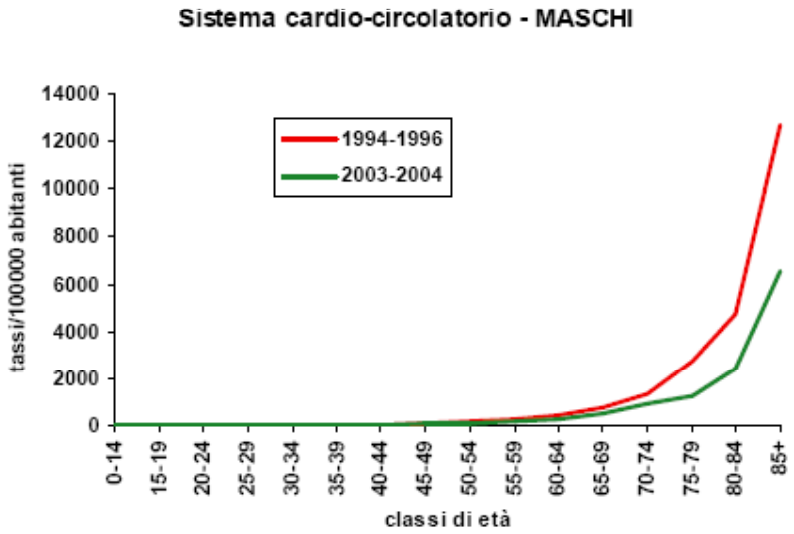
Tassi standardizzati di mortalità
in Umbria per periodo

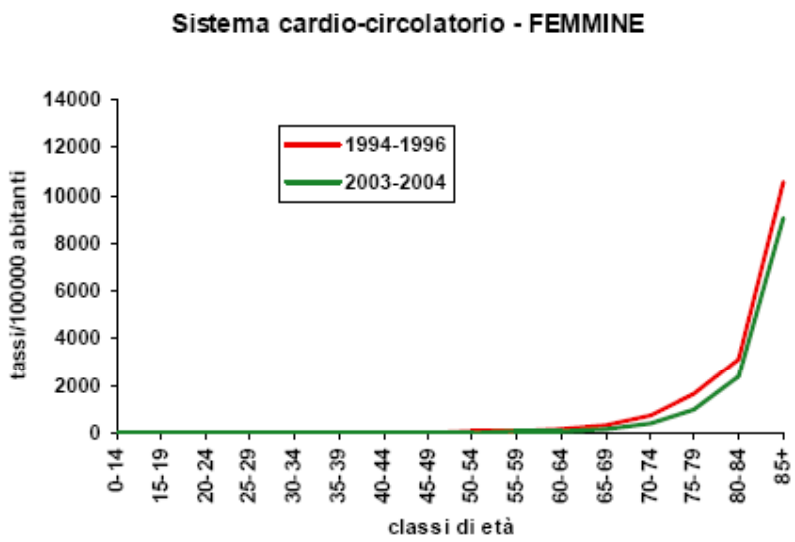


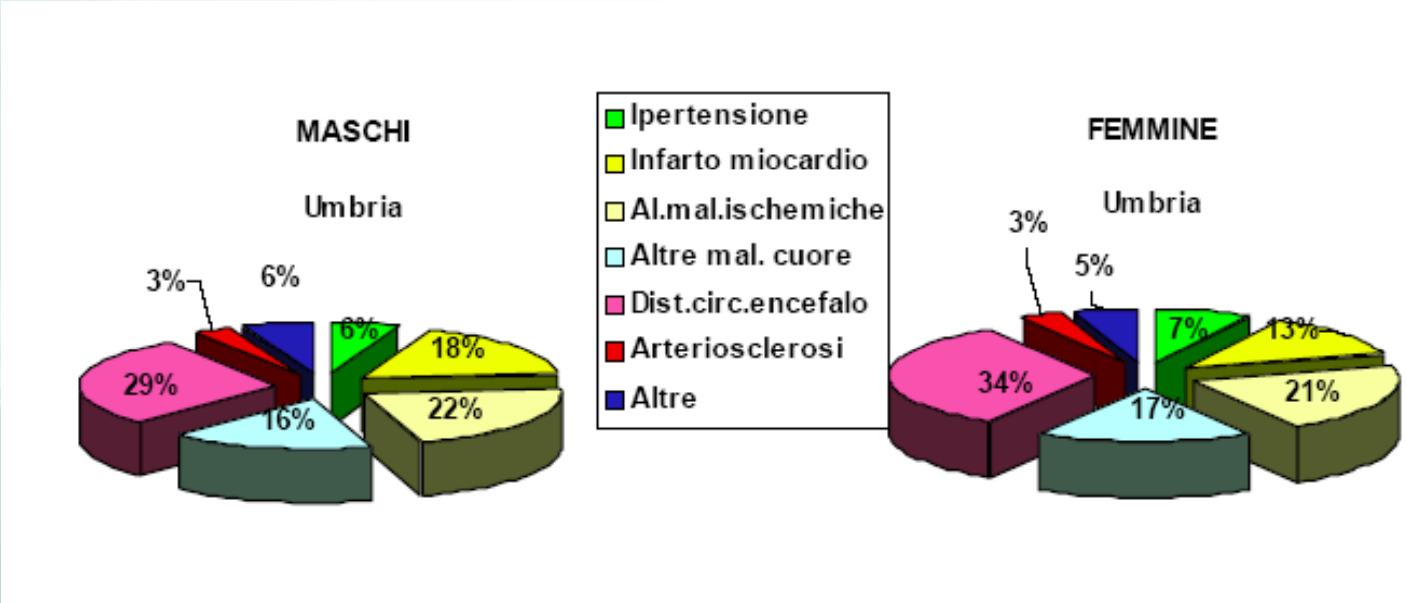
Tassi standardizzati di mortalità
in Umbria per periodo


Maschi. Tasso Umbria: 432.9
ASL 1
ASL 2
ASL 3
ASL 4
Femmine. Tasso Umbria: 278.6
ASL 1
ASL 2
ASL 3
ASL 4
SRR %
≥ 107.5
102.5 – 107.4
97.5 – 102.4
92.5 – 97.4
< 92.5


MASCHI
Tumori maligni
2174.8
2090.6
1854.7
1836.3
Sist. circolatorio
1640.3
1655.2
1457.1
1165.8
Cause accidentali
1479.2
1342.0
1300.0
1120.6
App. digerente
326.3
262.4
244.5
212.7
Cause perinatali
279.6
303.8
193.1
200.0
Altre
1524.5
896.6
862.2
1059.2
Tutte le cause
7424.7
6550.6
5911.6
5594.6
0
2000
4000
6000
8000
YPLL <75 anni standardizzati / 100.000 ab.
1994-96
1997-99
2000-02
2003-04
FEMMINE
Tumori maligni
1572.2
1371.0
1374.8
1247.4
Sist. circolatorio
702.1
616.2
554.7
478.7
Cause accidentali
414.1
428.8
418.6
324.5
App. digerente
123.5
147.8
87.2
98.9
Cause perinatali
184.8
162.6
158.4
176.5
Altre
715.0
631.8
477.6
450.9
Tutte le cause
3711.7
3358.2
3071.3
2776.9
0
2000
4000
6000
8000
YPLL <75 anni standardizzati / 100.000 ab.


Sistema cardio-circolatorio - MASCHI
tassi/100000 abitanti
14000
12000
10000
8000
6000
4000
2000
0
1994-1996
2003-2004
0-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+
classi di età


Sistema cardio-circolatorio - FEMMINE
tassi/100000 abitanti
14000
12000
10000
8000
6000
4000
2000
0
1994-1996
2003-2004
0-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85+
classi di età


MASCHI
Umbria
3%
6%
6%
18%
29%
16%
22%
Ipertensione
Infarto miocardio
Al.mal.ischemiche
Altre mal. cuore
Dist.circ.encefalo
Arteriosclerosi
Altre
FEMMINE
Umbria
3%
5%
7%
13%
34%
17%
21%

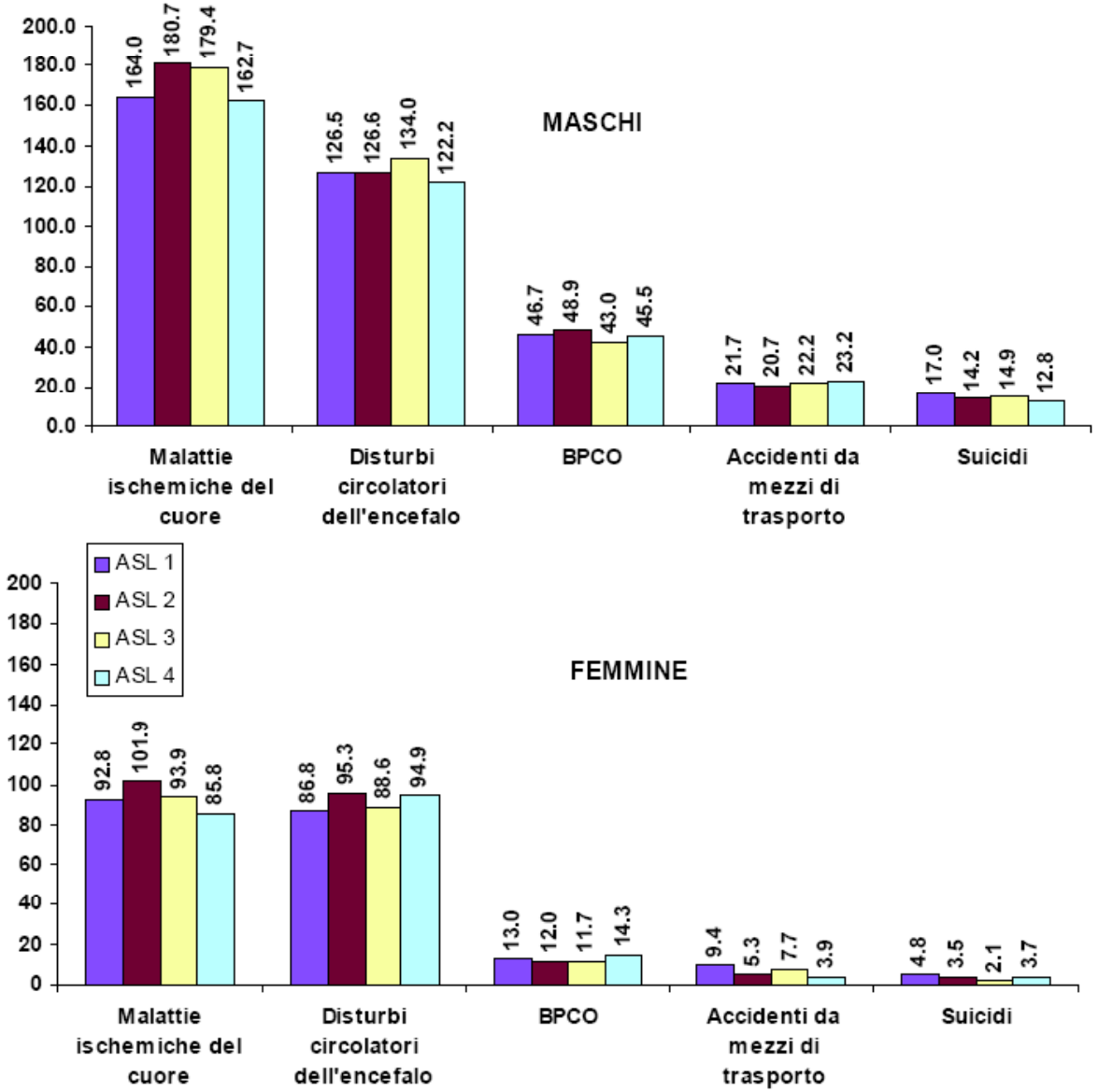
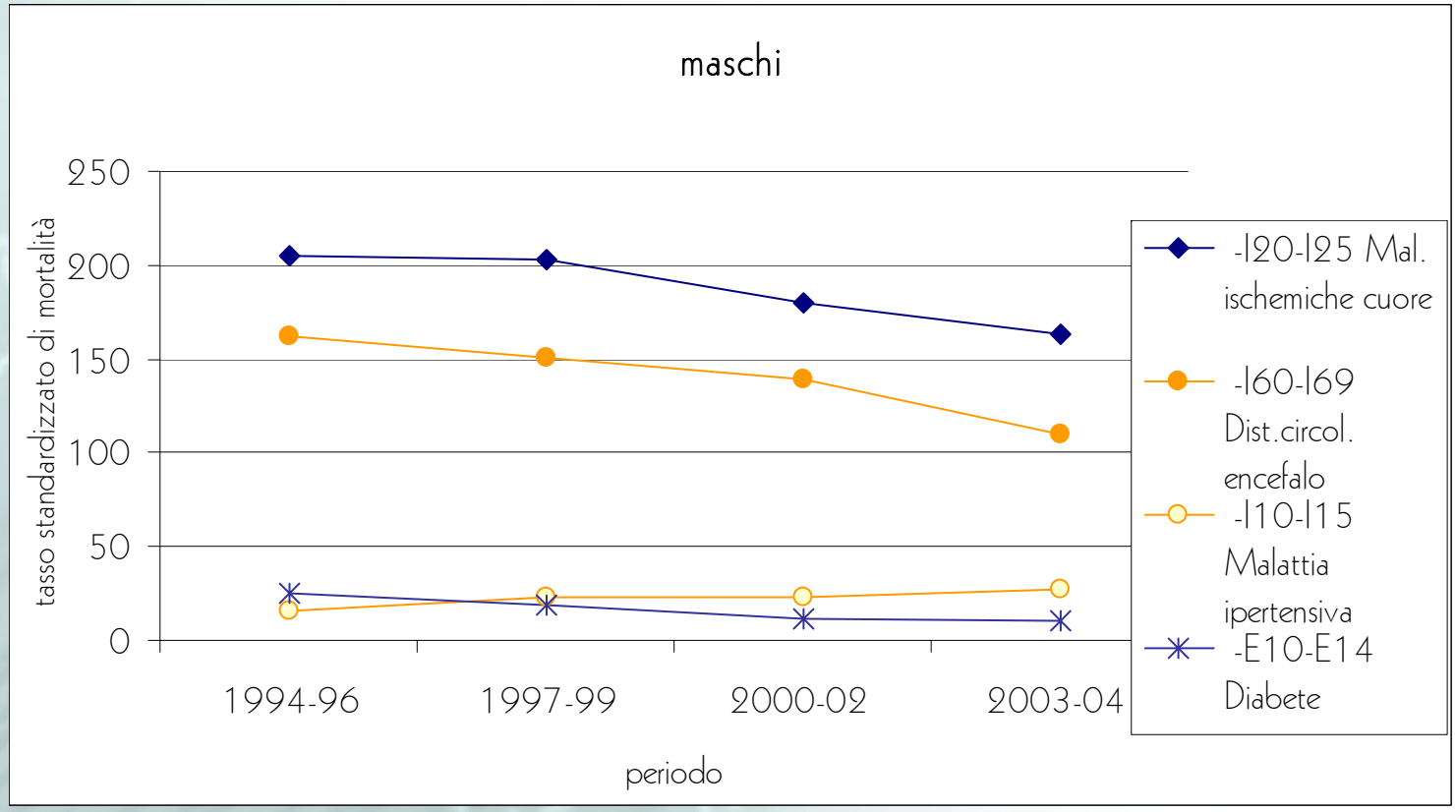
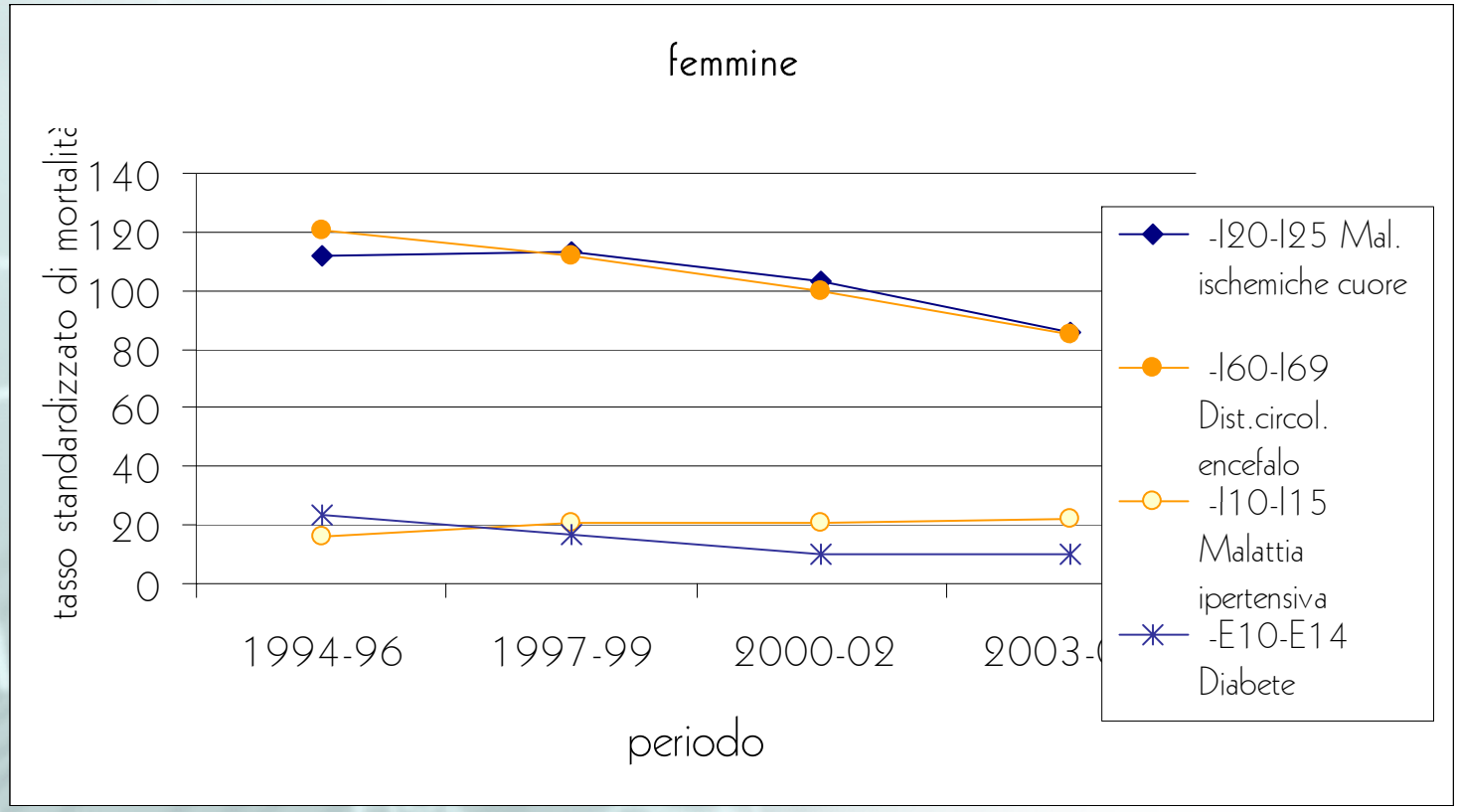


Figura 10. Mortalità per cause diverse nelle quattro ASL dell'Umbria. Anni 2000-2004.


maschi
250
200
150
100
50
0
tasso standardizzato di mortalità
1994-96
1997-99
2000-02
2003-04
periodo
-I20-I25 Mal. ischemiche cuore
-I60-I69 Dist.circol. encefalo
-I10-I15 Malattia ipertensiva
-E10-E14 Diabete


femmine
tasso standardizzato di mortalità
140
120
100
80
60
40
20
0
1994-96
1997-99
2000-02
2003-
periodo
-I20-I25 Mal. ischemiche cuore
-I60-I69 Dist.circol. encefalo
-I10-I15 Malattia ipertensiva
-E10-E14 Diabete

Fattori di rischio convenzionali

- Fumo di tabacco
- Ipertensione
- Ipercolesterolemia
- Diabete

Così definiti perché numerosi studi ne hanno confermato il ruolo come 'predittori' indipendenti ed esistono studi sperimentali che evidenziano una riduzione del rischio conseguente alla loro modificazione

La mortalità si riduce ma…

the relative mortality rates from coronary artery disease and stroke have decreased by 4.5% and 1.6%, respectively, and the prevalence of hypercholesterolemia and of smoking has decreased by 14% and 3.8%, respectively.
However, in that same period, the national prevalence of hypertension, physical inactivity, diabetes, and obesity has increased by 18%, 5%, 4%, and 8%, respectively.

Cigarette smoking was associated with premature CHD in men and women, decreasing the age at the time of CHD event (at trial entry) by nearly 10 years in all risk factor combinations. Diabetes was also associated with premature CHD in women.

Dieta e attività fisica

Diet and nutrition play a critical role in the causation of major CVDs and, along with physical activity, influence many of the biologic variables that mediate the risk of those diseases

Lo studio PASSI

Anno 2005
Età 18-69 anni
200 soggetti per ASL / 600 per regione: Stratificazione per ASL >campione proporzionale alla popolazione
Lista di campionamento: anagrafi sanitarie
Strumento: questionario telefonico

http://www.epicentro.iss.it/passi/Workshop_passi.asp

http://www.epicentro.iss.it/passi/pdf/workshop7-2005/2_Passi_carla_21luglio1.pdf

Aspetti idagati

- Attività fisica
- Abitudine al fumo
- Abitudini alimentari
- Consumo di alcol
- Fattori di rischio cardiovascolare
- Sicurezza stradale

- Screening oncologici
- Valutazione carta del rischio cardiovascolare

Alcuni limiti

si tratta di dati riferiti dalla popolazione

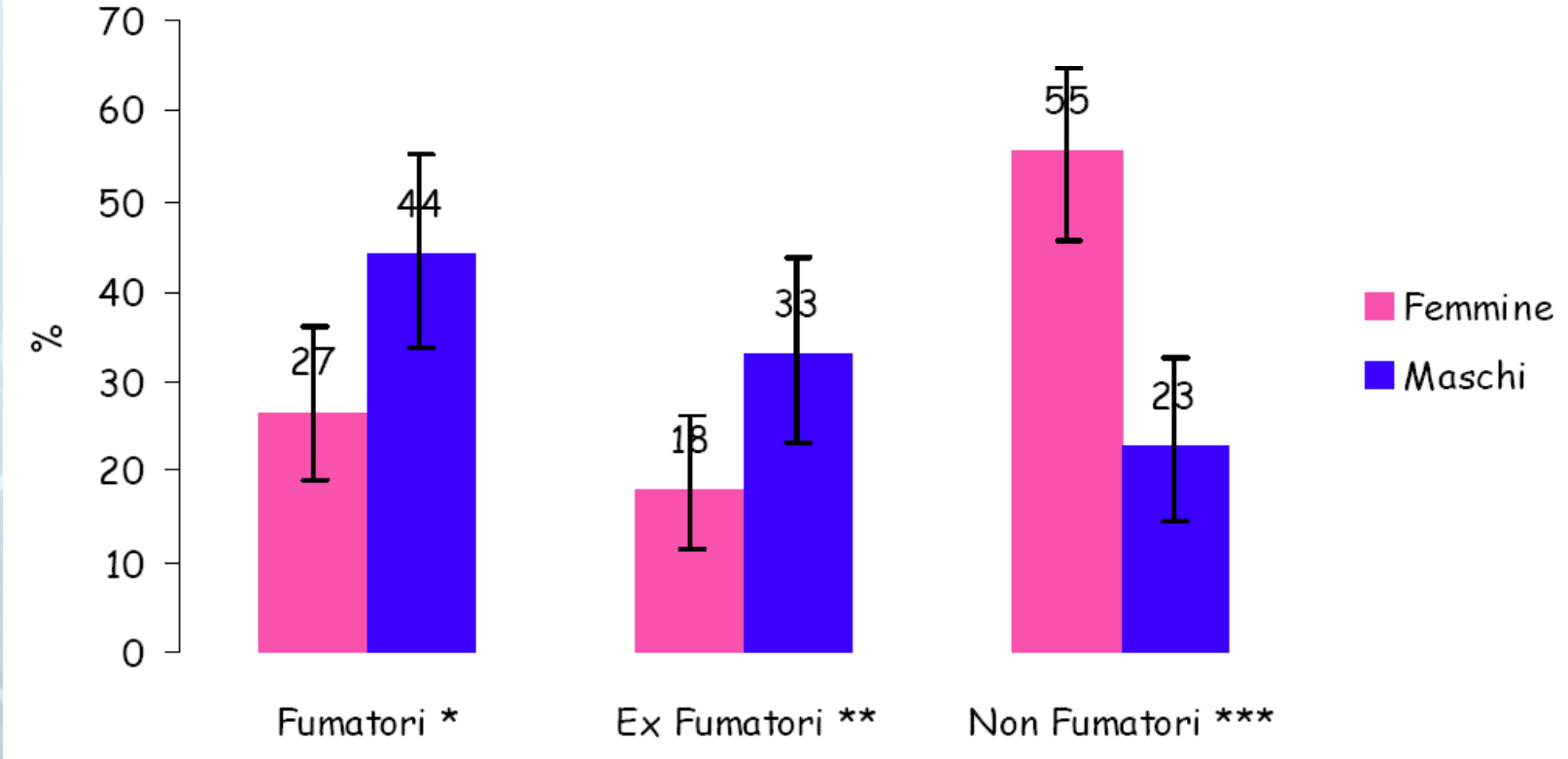
– possibile sovrastima dell'attività fisica e sottostima dell'IMC e del consumo di alcol

– possibile sottostima dell'effettivo counseling

i comportamenti possono essere in funzione del periodo dell'anno

http://www.epicentro.iss.it/passi/pdf/workshop7-2005/6_Pirous.pdf

fumatori (n=69) 34%

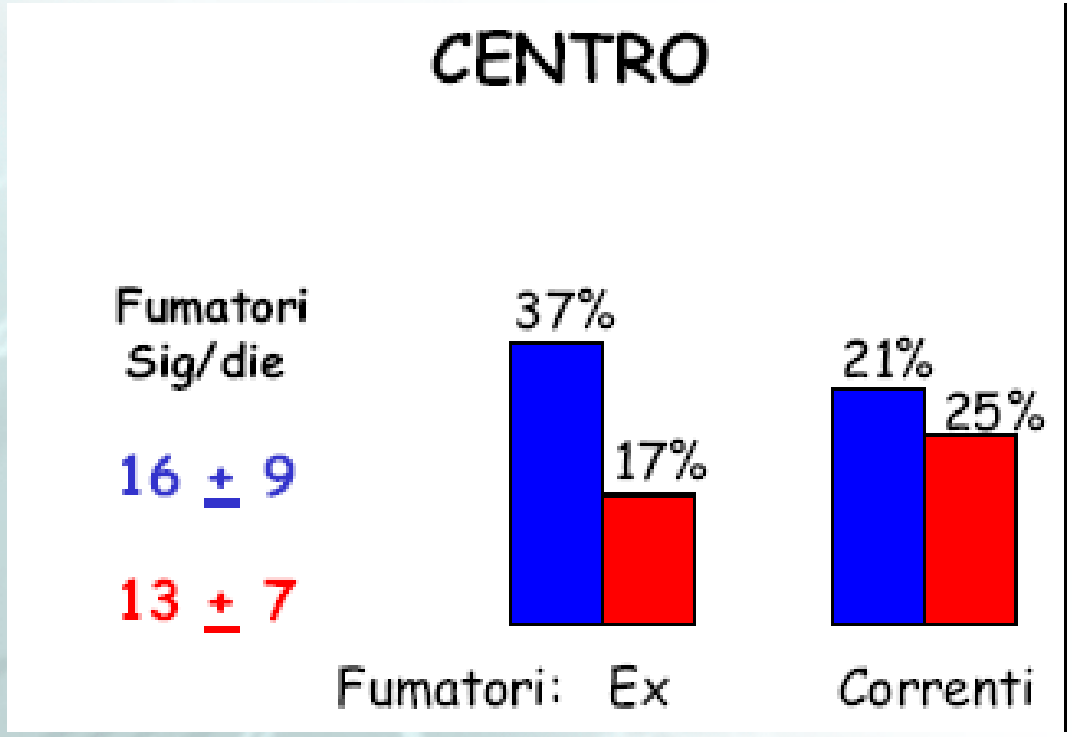


Abitudine di fumare in un campione di adulti, asl 2

(prevalenza maggiore sotto i 35 anni)

http://www.epicentro.iss.it/passi/pdf/workshop7-2005/5_Bietta.pdf

Progetto cuore fumatori ed ex per sesso. Età 35-74 anni



Attività fisica

…the National Heart Foundation, the World Health Organisation and International Society of Hypertension, the United States Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure, and the Exercise and hypertension **have all recommended increased physical activity as a first line intervention for preventing and treating patients with prehypertension** (systolic BP 120–139 mmHg and/or diastolic BP 80–89 mmHg). The guidelines also recommend exercise as a treatment strategy for patients with grade 1 (140–159/80–90 mmHg), or grade 2 (160–179/100–109 mmHg) hypertension…

It is therefore important to prescribe exercise for patients who have hypertension, or are at risk of getting hypertension, with the same consideration as prescribing any other effective treatment.

- Lavoro pesante 24% di chi lavora
- Adesione alle Linee Guida 34%

(escluso chi ha un lavoro pesante)

AF moderata 30 min x 5 gg

AF intensa 20 min x 3 gg

  - I maschi (ai limiti della significatività)
  - Inversamente proporzionale all'età
  - Indipendente dall'istruzione

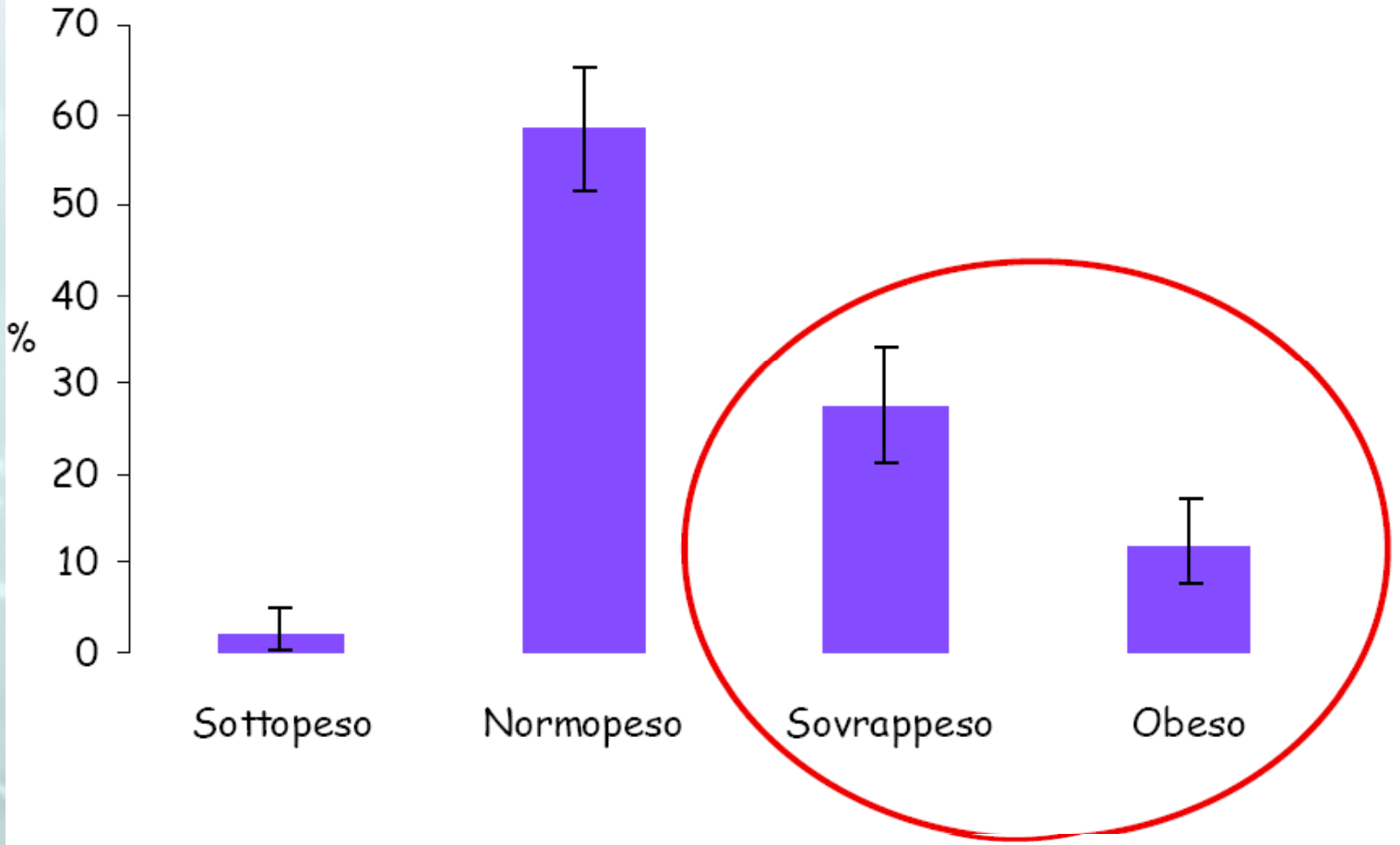
→ Non sedentari * = 45% (IC 95%: 37,7- 51,9)

*chi aderisce alla LG o fa un lavoro pesante

Maschi 2,5 volte più attivi delle femmine (p=0,002)

Non sembra dipendere da

- Età
- Istruzione
- Eccesso ponderale

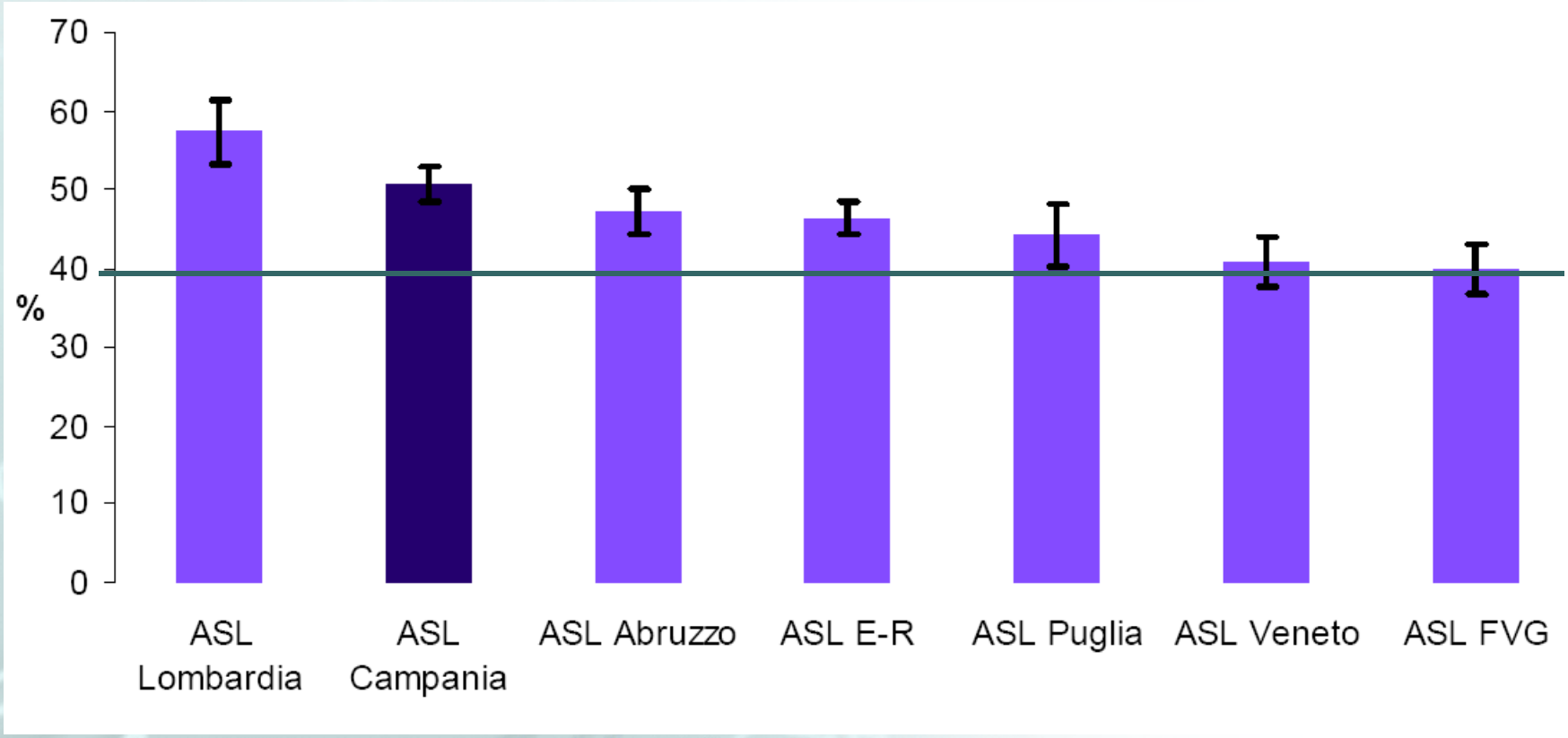


Eccesso ponderale 39% (IC 95%: 37,2 - 46,6)

Aumenta con l'età (p=0,000)

Nei maschi 2 volte in più (p=0,03)

Chi ha maggior istruzione



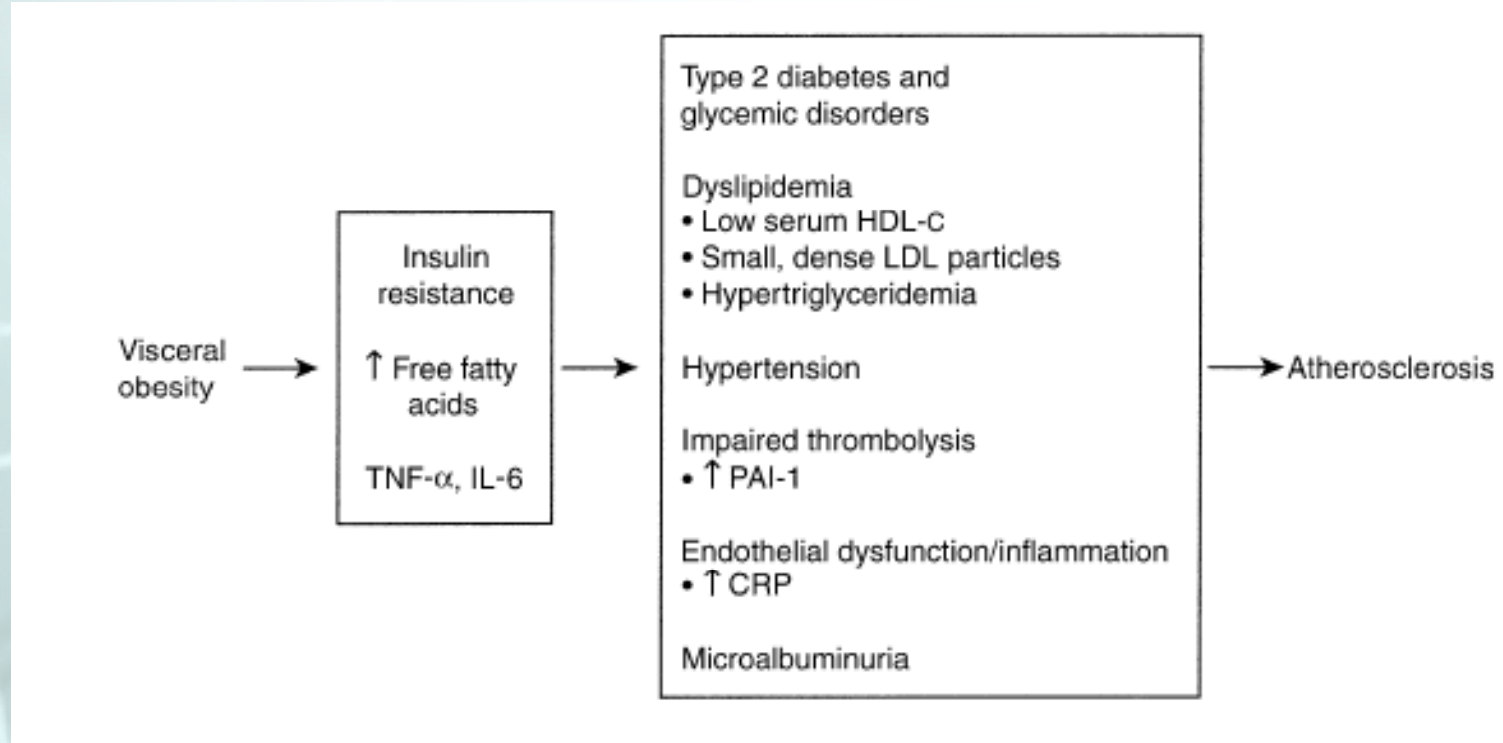
Confronto del dato relativo alla asl2 dell'Umbria con altre regioni

The relation between central obesity and cardiovascular disease (CVD) is complex. Some investigators have reported that the connection is indirect and dependent on an increased prevalence of diabetes, hypertension, and dyslipidemia, whereas others have found that obesity is an independent risk factor for CVD.

Table 1. Cardiovascular Risk Factors Associated with Visceral Obesity

- Insulin resistance/hyperinsulinemia
- Low serum levels of HDL-C
- High serum triglyceride concentrations
- Increased apolipoprotein B serum concentrations
- Small, dense LDL particles
- Increased serum fibrinogen concentrations
- Increased production of plasminogen activator inhibitor
- Increased serum levels of C-reactive protein
- Increased production of tumor necrosis factor-α
- Increased production of interleukin-6
- Microalbuminuria
- Increased blood viscosity
- Increased systolic and pulse pressure
- Left ventricular hypertrophy
- Premature atherosclerosis
- Microalbuminuria

HDL-C = high-density lipoprotein cholesterol; LDL = low-density lipoprotein.


Visceral obesity
Insulin resistance
↑ Free fatty acids
TNF-α, IL-6
Type 2 diabetes and glycemic disorders
Dyslipidemia
• Low serum HDL-C
• Small, dense LDL particles
• Hypertriglyceridemia
Hypertension
Impaired thrombolysis
• ↑ PAI-1
Endothelial dysfunction/inflammation
• ↑ CRP
Microalbuminuria
Atherosclerosis

Dieta e CVD

Lo studio della relazione tra dieta e CVD pone notevolissime difficoltà e tuttavia alcuni aspetti possono essere considerati come acquisiti

Le evidenze prodotte riguardano di volta in volta nutrienti, cibi o diete

Issues related to study design

Studies investigating the influence of diet on CVD or cardiovascular risk factors have employed a wide variety of study designs—ecological studies within and across populations, cross-sectional surveys, case–control studies (de novo or nested), cohort studies, community based demonstration projects randomised clinical trials and before–after type of metabolic studies.

These differ widely in terms of their ability to

(a) identify, avoid and adjust for confounding,

(b) establish a temporal relationship of cause preceding the effect,

(c) minimise bias,

(d) provide a wide range of exposure,

(e) ascertain composite endpoints, including fatal outcomes,

(f) evaluate population attributable risk and

(g) yield generalisable results

The failure of anti-oxidants, when administered as pills, to favourably influence cardiovascular outcomes in clinical trials does not negate a protective role for their primary food sources, as suggested by ecological and observational studies.

Associazioni

Unhealthy dietary behaviours often occur in association with other unhealthy behaviours such as physical inactivity and smoking. Furthermore, unhealthy dietary practices such as high consumption of saturated fats, salt and refined carbohydrates as well as low consumption of fruit and vegetables tend to cluster together.

Issues related to diet as an independent variable

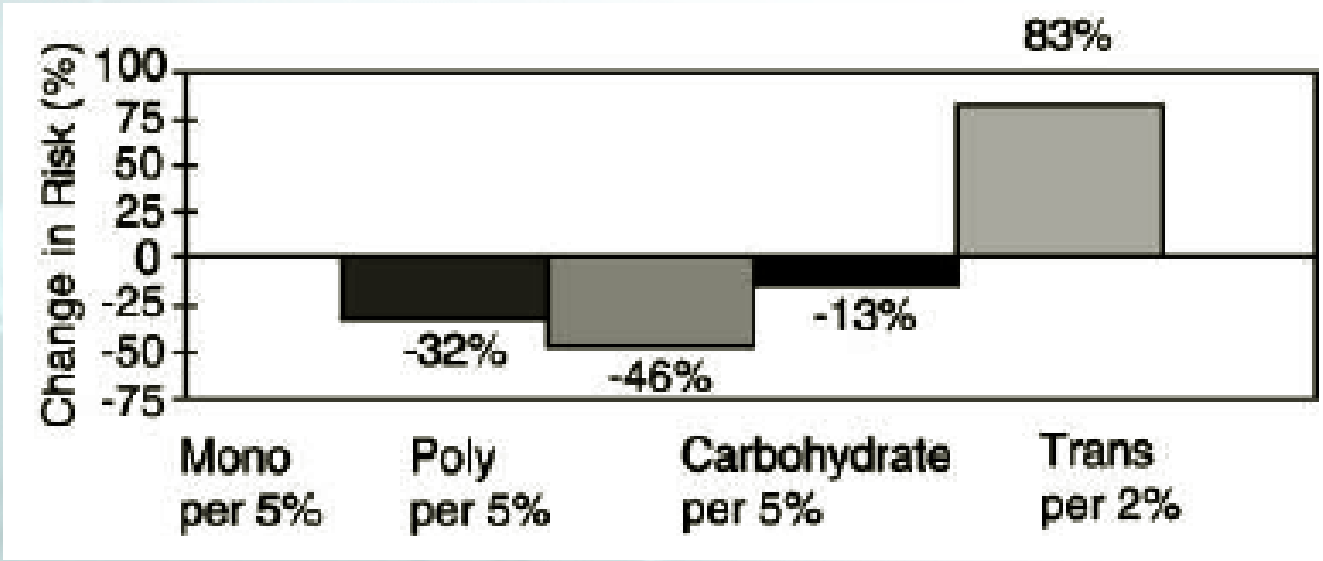
Dietary behaviours may also reflect **patterns** influenced by social class and may be influenced by stress levels. . . In observational studies, the question arises whether some dietary practices are merely a surrogate for other dietary practices or for a composite of multiple health behaviours.

Grasso nella dieta

The association (with CHD risk *ndr*) of plasma total cholesterol and its lowdensity lipoprotein sub fraction (**LDL cholesterol**) has been consistently demonstrated . . . and the **ratio of total to HDL cholesterol** has emerged as a strong predictor of the risk of CHD.

. . .large randomised clinical trials, in which replacement of saturated and trans fats by **polyunsaturated vegetable oils** effectively lowered CHD risk

Eliminating **t-FAs** from the diet would be an important public health strategy to prevent CVD. Since these are commercially introduced agents into the diet, policy measures related to the food industry would be required


Change in Risk (%)
100
75
50
25
0
-25
-50
-75
-32%
-46%
-13%
83%
Mono
per 5%
Poly
per 5%
Carbohydrate
per 5%
Trans
per 2%

Carboidrati

There is as yet no clear evidence that the risk of CVD is altered independently by the carbohydrate levels in the diet.

The glycaemic index of foods might also be a determinant of the extent to which carbohydrates can influence the glycaemic status.

Fibre

Diversi studi per lo più osservazionali riportano un effetto positivo su ipertensione e CHD. Evidenze sperimentali evidenziano effetti positivi sull'assetto lipidico

Since some of the reported benefits may have risen from other dietary components occurring in association with fibre in natural foods, dietary consumption of high-fibre rather than isolated fibre foods should be recommended

Beta carotene, vitamina E, C e folati

. . .current evidence does not support supplementation of any of these anti-oxidant vitamins for prevention of CHD. However, intake of their primary food resources, especially fruit and vegetables, may be encouraged. . .

The relationship of **folate** to CVD has been mostly explored through its effect on homocysteine, which has been incriminated as an independent risk factor for CHD and probably stroke. . .Recommendations related to folate supplementation must, however, await the results of ongoing clinical trials. Dietary intake of folate through natural food sources may be encouraged in the meanwhile, especially in individuals at a high risk of arterial or venous thrombosis and elevated plasma homocysteine levels

Simili risultati per flavonoidi ma con meno studi disponibili

Sale, pressione arteriosa e rischio di ictus

Of three population studies on restriction of salt, two (the Portuguese Salt Trial and the Tianjin trial in China) revealed significant reductions in blood pressure in the intervention group, while the third (the Belgian Salt Intervention Trial) did not reveal success because of difficulties in reducing salt consumption

Consumo raccomandato <5 g/d

Frutta e verdura

The effects of increased fruit and vegetable consumption on blood pressure alone or in combination with a low-fat diet, were assessed in the DASH trial

...(2.8 mmHg systolic and 1.1 mmHg diastolic). Such reductions, while seeming modest at the individual level, would result in a substantial reduction in population wide risk of CVD by shifting the blood pressure distribution

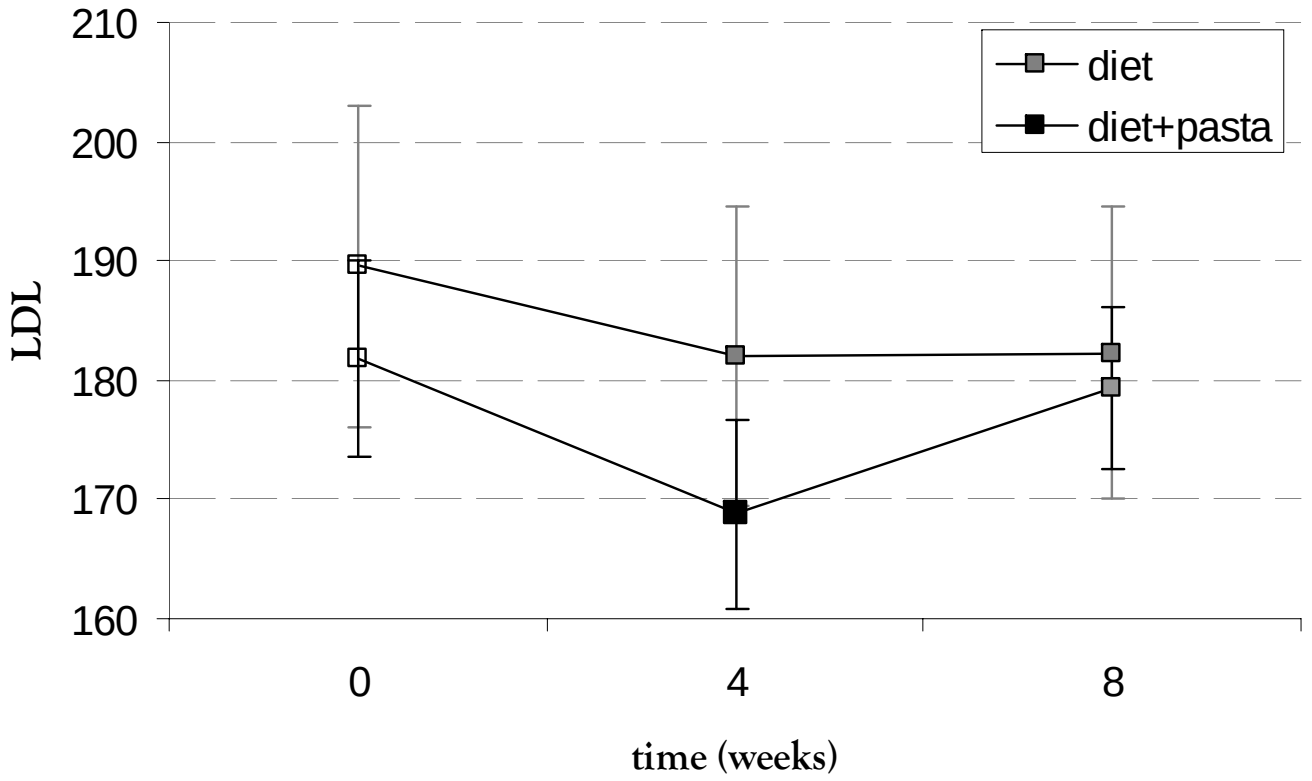
Pesce

While the protective effects of fish on CHD are principally mediated by n-3 PUFA, the contribution of other constituents of fish cannot be ruled out. The effect of dietary fish on the risk of stroke has been investigated in cohort studies, with conflicting results on the risk of ischaemic stroke

Altri cibi

Il consumo di frutta secca è stato consistentemente associato ad una riduzione del rischio di CHD in entrambi i sessi (acidi grassi insaturi?)

La soia sembra avere un effetto positivo sull'assetto lipidico probabilmente grazie al contenuto di isoflavonoidi, composti simil-estrogeni


210
200
190
180
170
160
LDL
0
4
8
time (weeks)
diet
diet+pasta

Alcohol

The relationship of alcohol to overall mortality and cardiovascular mortality has generally been **J-shaped**:

. . .its effect on the risk of CHD, as supported by more than 60 prospective studies. A consistent **coronary protective effect has been observed for consumption of 1–2 drinks per day**. . .but heavy drinkers have higher total mortality than moderate drinkers or abstainers, as do binge drinkers. . . Long-term heavy alcohol consumption (.60 g/d) increases an individual's risk for all stroke subtypes. . .Alcohol consumption, in excess of three drinks per day, is associated with a rise in blood pressure and plasma triglyceride levels

Table 1 Evidence for diet and risk of CVD

	Increase in risk	Decrease in risk	No relation
Convincing	Myristic and palmitic acids *t*-FAs High sodium intake Overweight High alcohol intake (for stroke)	LA Fruits, berries and vegetables Fish and fish oils (EPA and DHA) Potassium Physical activity Low to moderate alcohol intake (for CHD)	Vitamin E supplements
Probable	Dietary cholesterol Unfiltered boiled coffee β-Carotene supplements	ALNA OA Non-starch polysaccharides (fibre) Whole grain cereals Nuts (unsalted) Folate Plant sterols	Stearic acid
Possible	Fats rich in lauric acid Impaired fetal nutrition	Flavenoids Soy products	

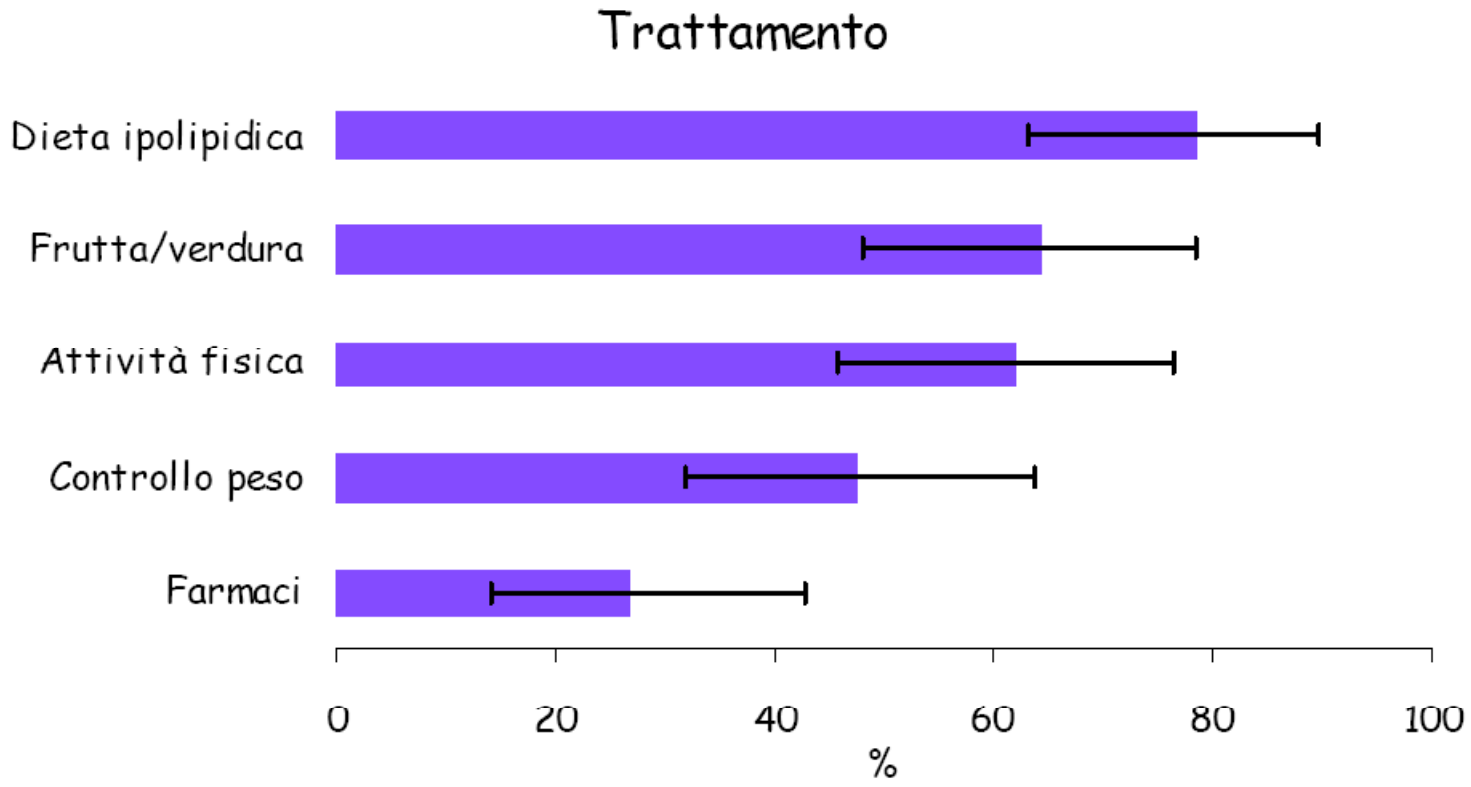
Insufficient evidence: carbohydrates, iron, calcium, magnesium, vitamin C

Ipercolesterolemici (n=42) 24% (IC 95%: 17,9 - 31,(

Femmine

Aumenta con l'età (p=0,014)

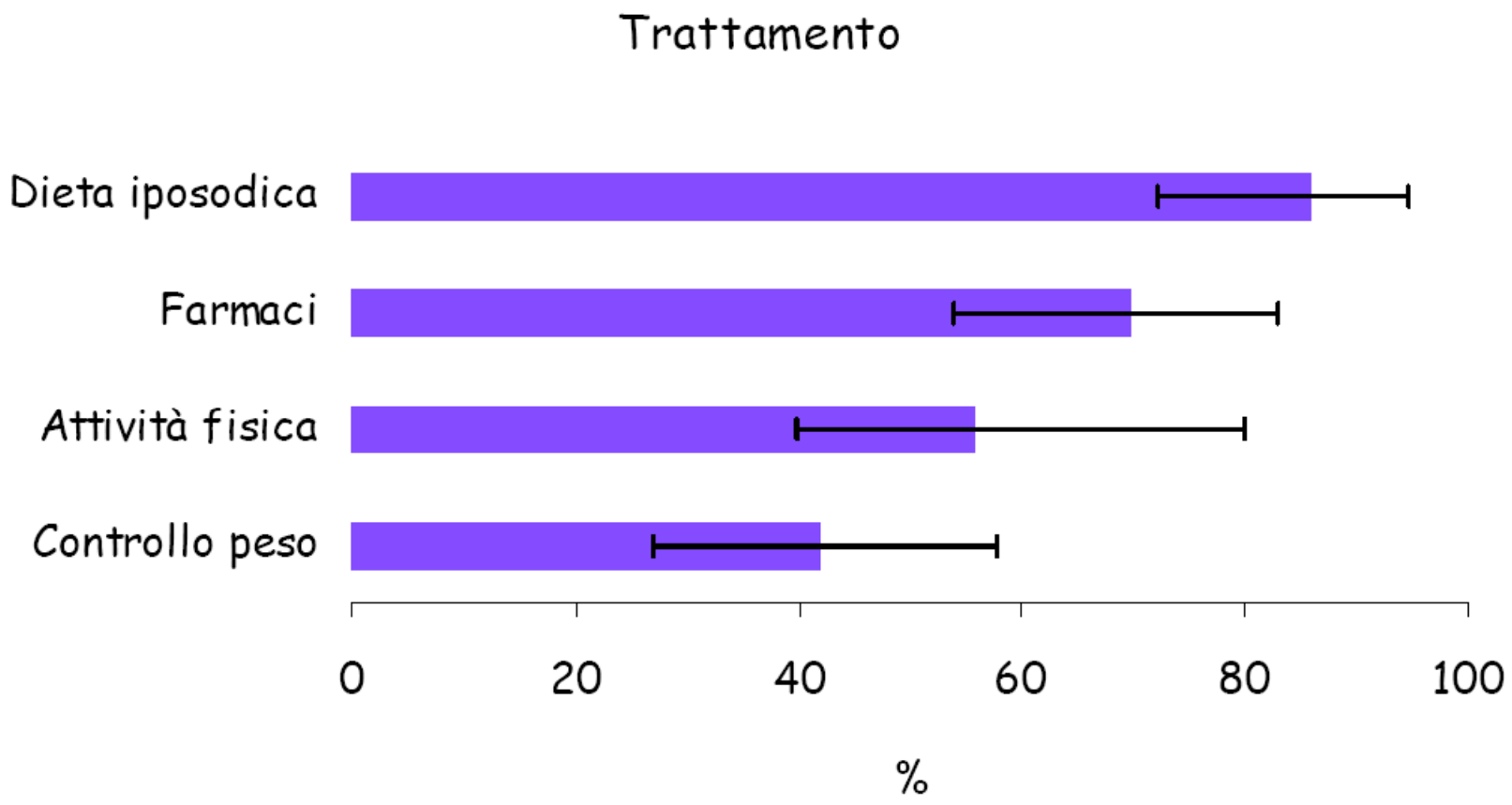
2 volte più nei meno istruiti (p=0,03)



Ipertesi (n=43) 24% (IC 95%: 17,7 - 30,5)

Maschi

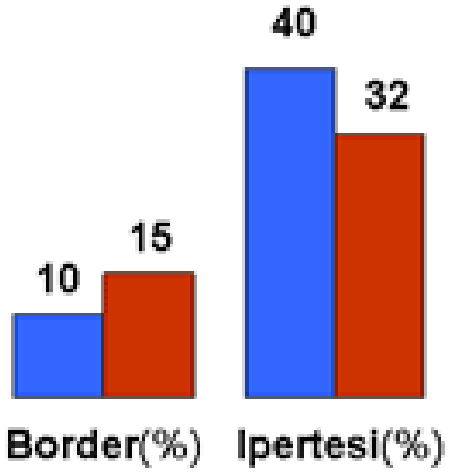
Aumenta con l'età (p=0,0000)



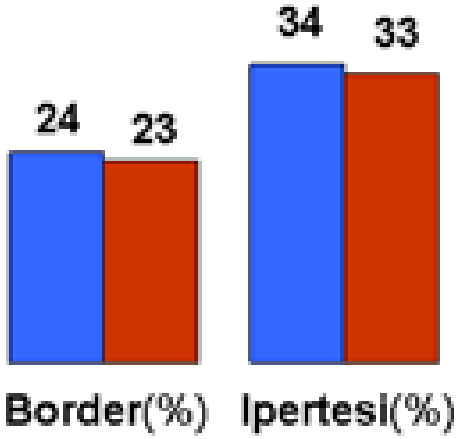
Progetto cuore: Corciano *(sopra)* e Foligno *(sotto)*

[con ipertensione o trattati per]

PAS mm Hg	PAD mm Hg
135 ± 16	83 ± 8
133 ± 17	81 ± 9

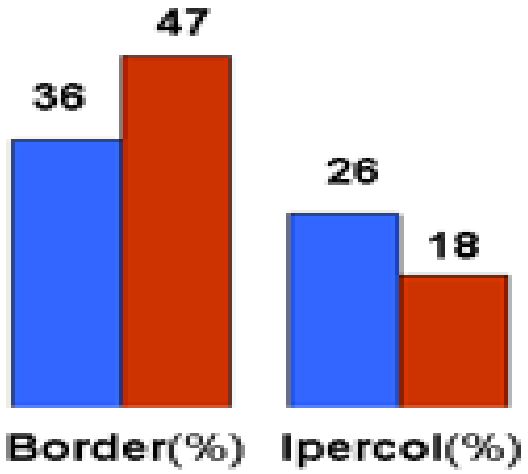


PAS mm Hg	PAD mm Hg
136 ± 10	88 ± 7
135 ± 13	85 ± 8

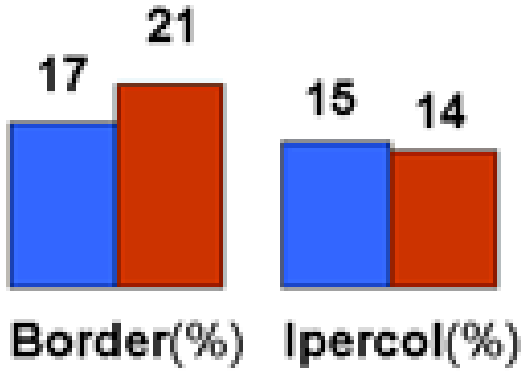


Progetto cuore: Corciano *(sopra)* e Foligno *(sotto)*

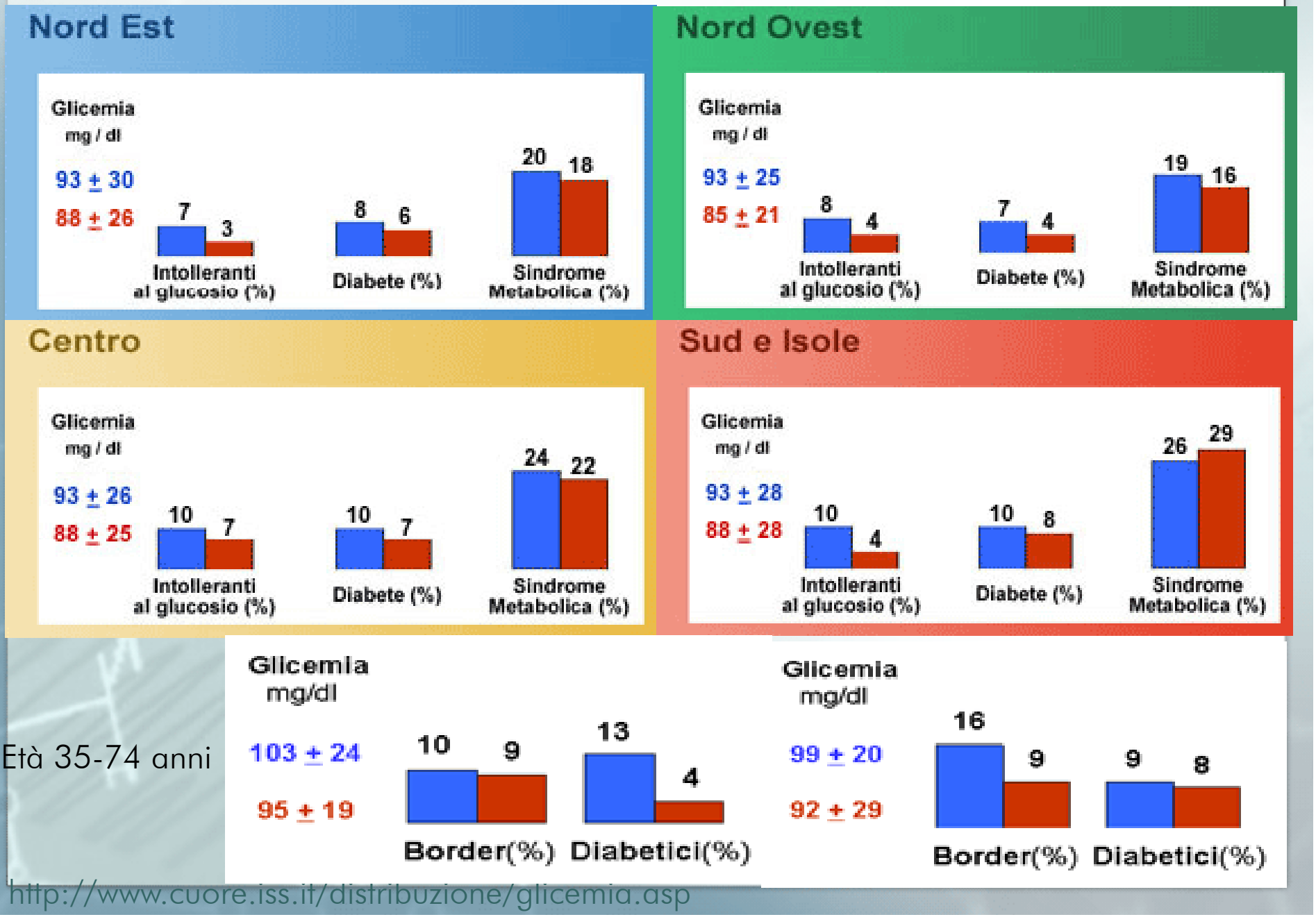
COL mg/dl	HDL mg/dl
213 ± 34	42 ± 8
210 ± 29	49 ± 9



COL mg/dl	HDL mg/dl
169 ± 42	46 ± 11
176 ± 43	59 ± 18



Diabete, intolleranza al glucoso e sindrome metabolica



http://www.cuore.iss.it/distribuzione/glicemia.asp

Panel: International Diabetes Federation: metabolic syndrome definition

Central obesity

Waist circumference*—ethnicity specific (see table 1)

Plus any two:

Raised triglycerides

>150 mg/dL (1·7 mmol/L)

Specific treatment for this lipid abnormality

Reduced HDL-cholesterol

<40 mg/dL (1·03 mmol/L) in men

<50 mg/dL (1·29 mmol/L) in women

Specific treatment for this lipid abnormality

Raised blood pressure

Systolic ≥130 mm Hg

Diastolic ≥85 mm Hg

Treatment of previously diagnosed hypertension

Raised fasting plasma glucose†

Fasting plasma glucose ≥100 mg/dL (5·6 mmol/L)

Previously diagnosed type 2 diabetes

If above 5·6 mmol/L or 100 mg/dL, oral glucose tolerance test is strongly recommended, but is not necessary to define presence of syndrome

* If body-mass index is over 30 kg/m², central obesity can be assumed and waist circumference does not need to be measured. † In clinical practice, impaired glucose tolerance is also acceptable, but all reports of prevalence of metabolic syndrome should use only fasting plasma glucose and presence of previously diagnosed diabetes to define hyperglycaemia. Prevalences also incorporating 2-h glucose results can be added as supplementary findings.

The technology for identifying CVD in its earliest stages has improved over the past decade, and this has led to a blurring of the distinction between primary and secondary prevention

Spectrum of CVD Risk in Women

Risk Group	Framingham Global Risk (10-y Absolute CHD Risk)	Clinical Examples
High risk	>20%	• Established CHD • Cerebrovascular disease* • Peripheral arterial disease • Abdominal aortic aneurysm • Diabetes mellitus • Chronic kidney disease†
Intermediate risk	10% to 20%	• Subclinical CVD‡ (eg, coronary calcification) • Metabolic syndrome • Multiple risk factors§ • Markedly elevated levels of a single risk factor • First-degree relative(s) with early-onset atherosclerotic CVD (age: _55 y in men and _65 y in women)
Lower risk	<10%	• May include women with multiple risk factors, metabolic syndrome, or 1 or no risk factors
Optimal risk	<10%	• Optimal levels of risk factors and heart-healthy lifestyle

I fattori di rischio inclusi nella carta del rischio cardiovascolare:

genere espresso in due categorie, uomini e donne;

diabete espresso in due categorie, diabetico e non diabetico in base all'anamnesi;

età espressa in anni e considerata in decenni 40-49, 50-59, 60-69;

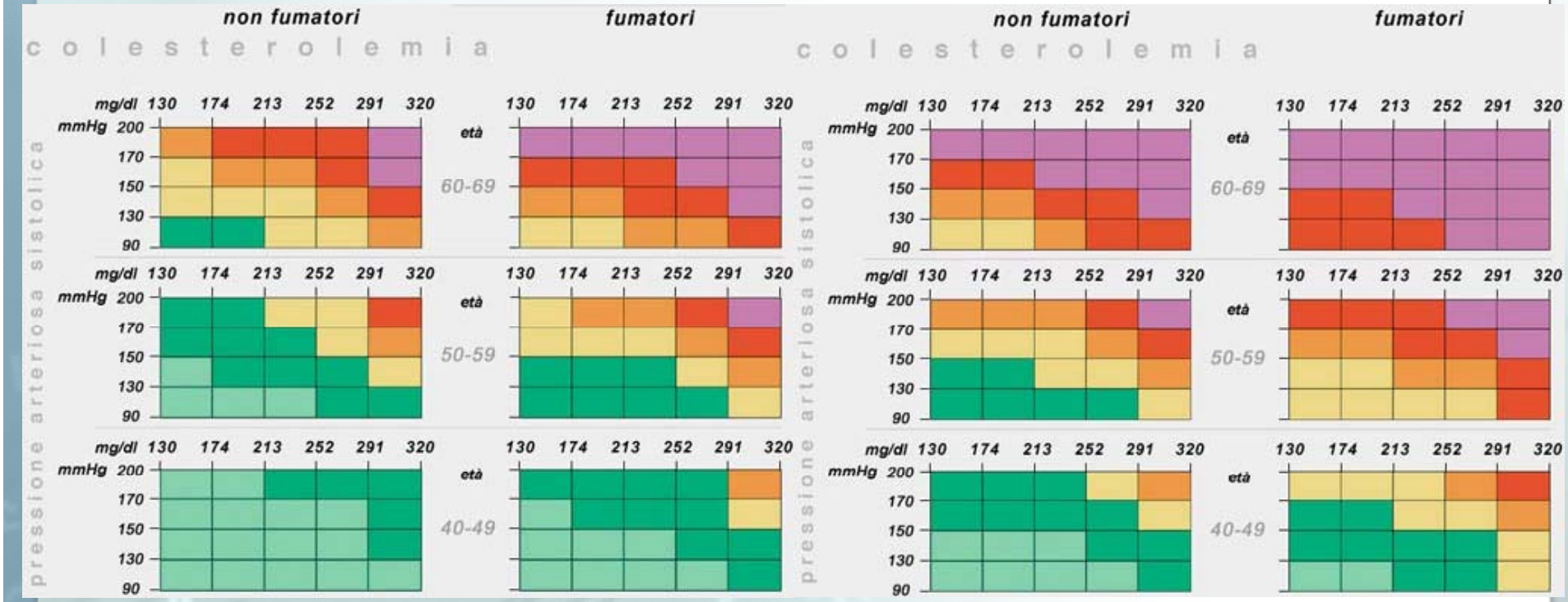
abitudine al fumo di sigaretta espressa in due categorie fumatori e non fumatori;

pressione arteriosa sistolica espressa in mmHg; rappresenta la pressione sistolica come media di due misurazioni consecutive eseguite secondo la metodologia indicata. Viene suddivisa in quattro categorie: minore o uguale di 129 mmHg, da 130 a 149 mmHg, da 150 a 169 mmHg, uguale o superiore a 170 mmHg. Per persone che hanno il valore della pressione arteriosa sistolica superiore a 200 mmHg o inferiore a 90 mmHg non è possibile utilizzare la carta per la valutazione del rischio;

colesterolemia espressa in mg/dl (o in mmol/l); viene suddivisa in cinque intervalli, con valore centrale rispettivamente di 154 mg/dl (4 mmol/l), 193 mg/dl (5 mmol/l), 232 mg/dl (6 mmol/l), 270 mg/dl (7 mmol/l), 309 mg/dl (8 mmol/l).

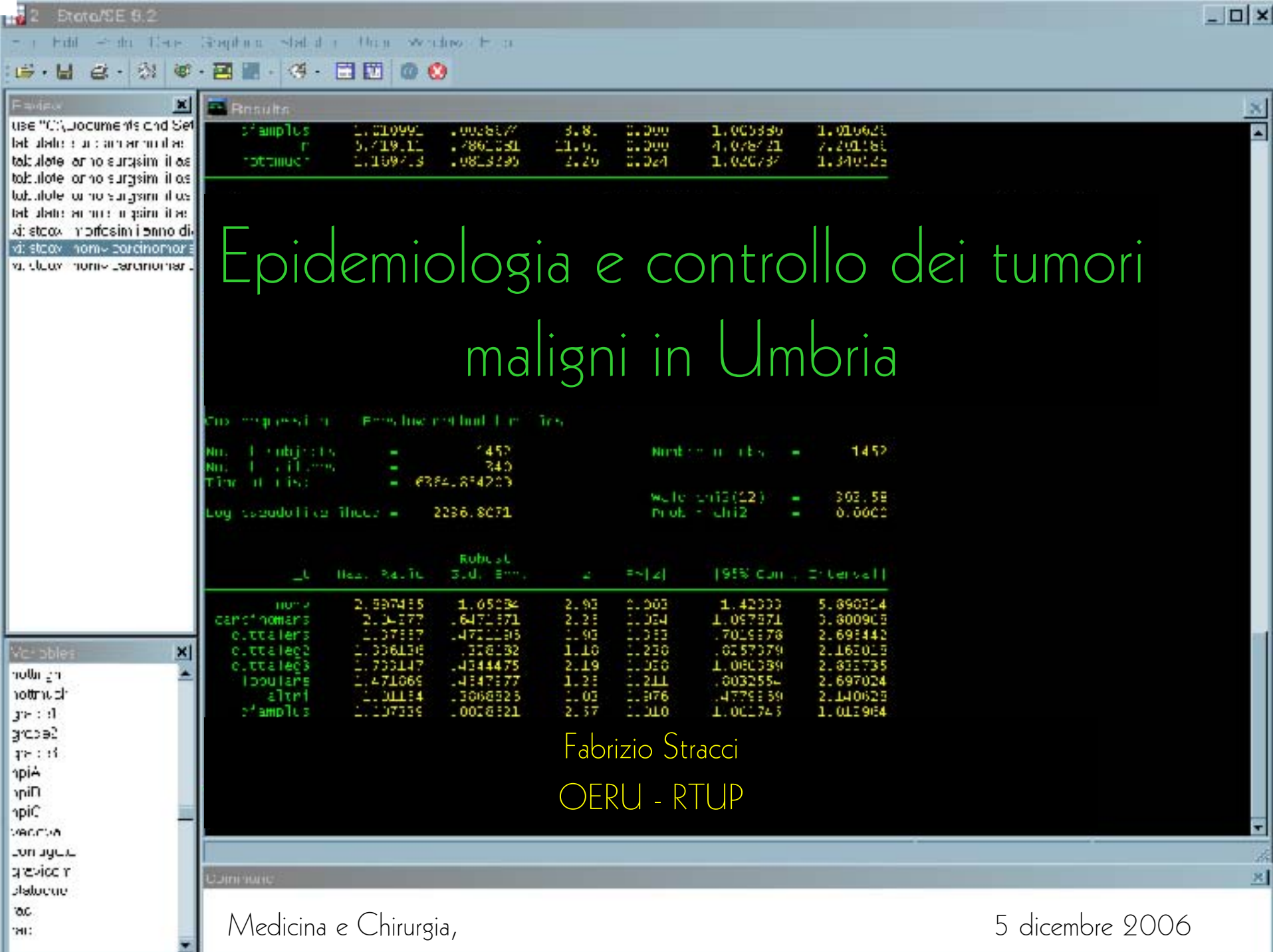
Non diabetici

Diabetici



Preventing chronic diseases: taking stepwise action

- The national level of government provides the unifying framework for chronic disease prevention and control, so that actions at all levels and by all stakeholders are mutually supportive.
- Intersectoral action is necessary at all stages of policy formulation and implementation because major determinants of the chronic disease burden lie outside the health sector.
- Policies and plans focus on the common risk factors and cut across specific diseases.
- As part of comprehensive public-health action, population-wide and individual interventions are combined.
- In recognition that most countries will not have the resources to immediately do everything implied by the overall policy, activities that are immediately feasible and likely to have the greatest impact for the investment are selected first for implementation. This principle is the heart of the stepwise approach.
- Locally relevant and explicit milestones are set for each step and at each level of intervention with a particular focus on reducing health inequalities.


Epidemiologia e controllo dei tumori maligni in Umbria
Fabrizio Stracci
OERU - RTUP
Medicina e Chirurgia,
5 dicembre 2006

Fonti di dati epidemiologici attive:

Registro tumori [RTUP]. Informazioni ordinariamente prodotte:

- Incidenza: nuovi casi che insorgono nella popolazione residente in un tempo definito (spesso anno)
- [*Prevalenza: individui residenti con diagnosi di tumore maligno viventi ad una certa data*]
- Sopravvivenza relativa: probabilità di sopravvivere al tempo t dalla diagnosi se la sola causa di morte fosse la malattia in studio

AIRT Working Group. I tumori in Italia – Rapporto 2006: **Incidenza, mortalità e stime**. Epidemiologia e prevenzione; 2006; suppl.2, pp.62-63. .

Registro di mortalità [ISTAT, ReNCaM]. Informazioni prodotte:

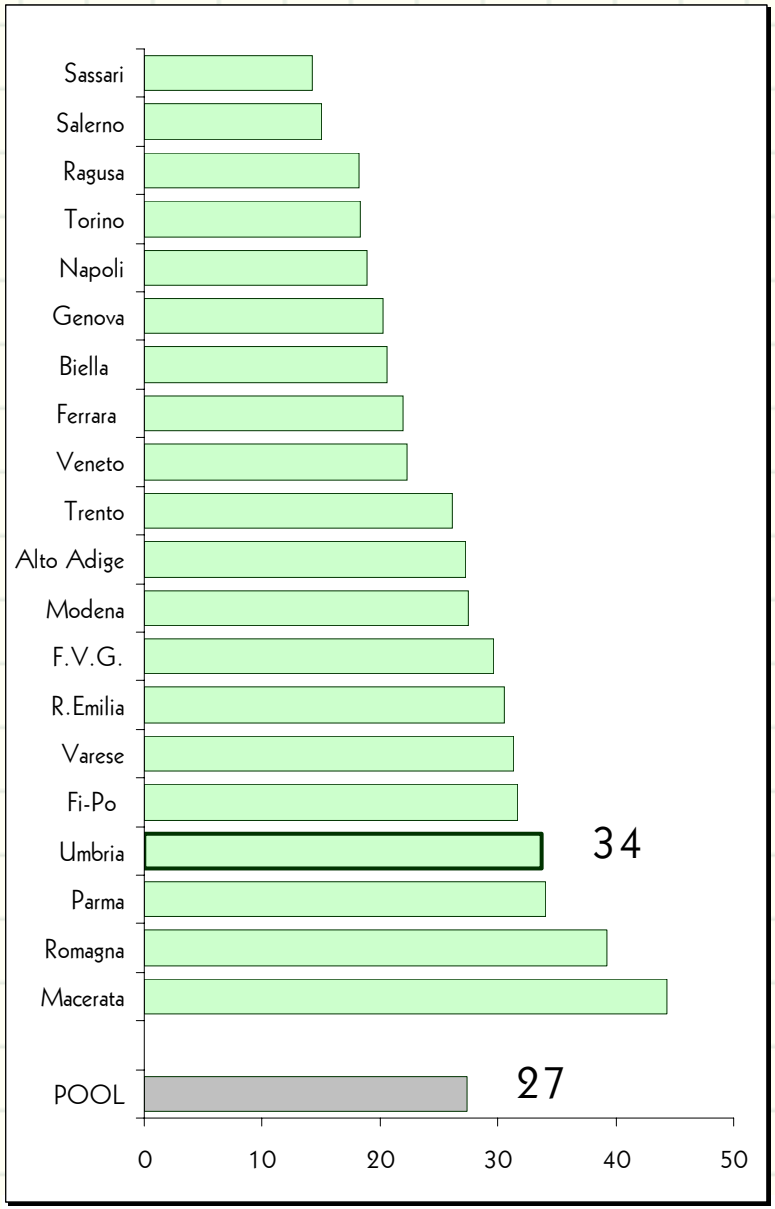
- Mortalità: decessi per causa tra i residenti in un periodo definito (spesso anno)

Vichi M, Masocco M, Conti S, De Angelis R, Verdecchia A. **Mortalità per tumori in Italia** (biennio 2000-2001). Rapporti Istisan 06/21; 2006.

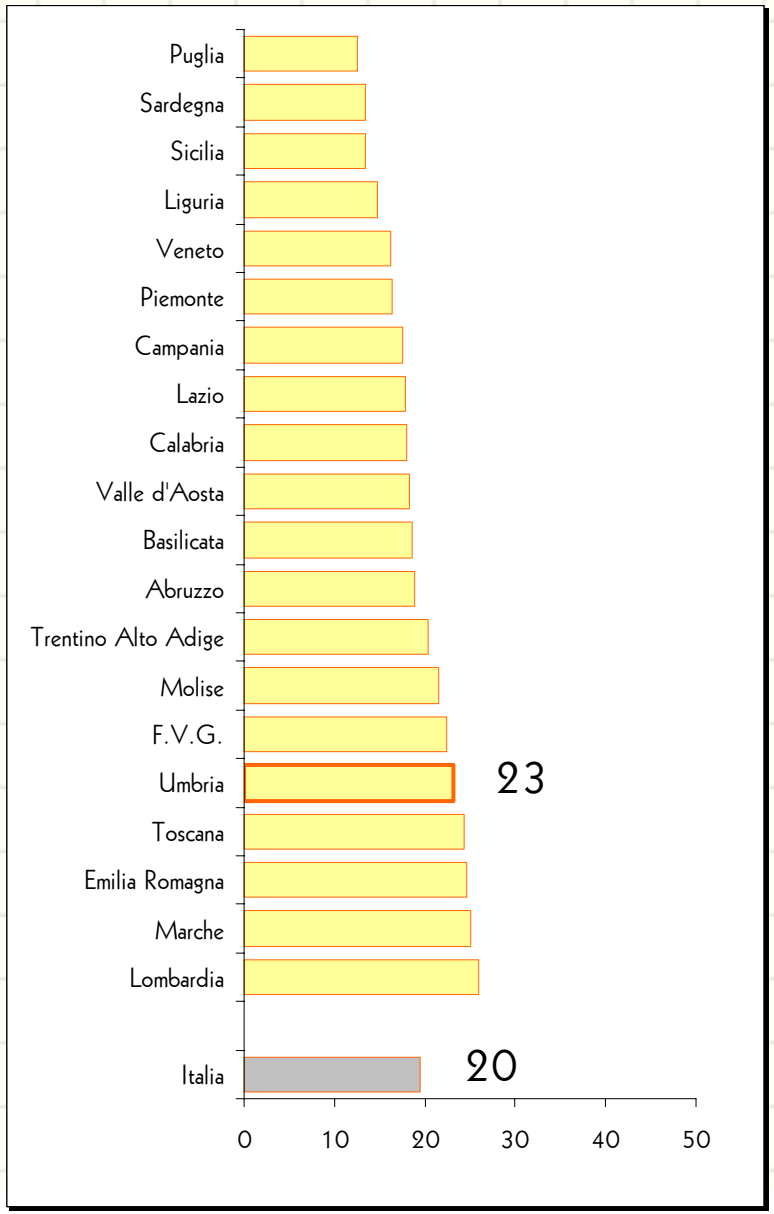
Programmi di screening. Informazioni prodotte:

- *Adesione: percentuale di persone che si sottopongono al test di screening sul totale delle persone che avrebbero dovuto effettuare il test*
- *[Altri dati]*

Cancro dello stomaco - Maschi . Tassi standardizzati per 100.000 ab. per anno

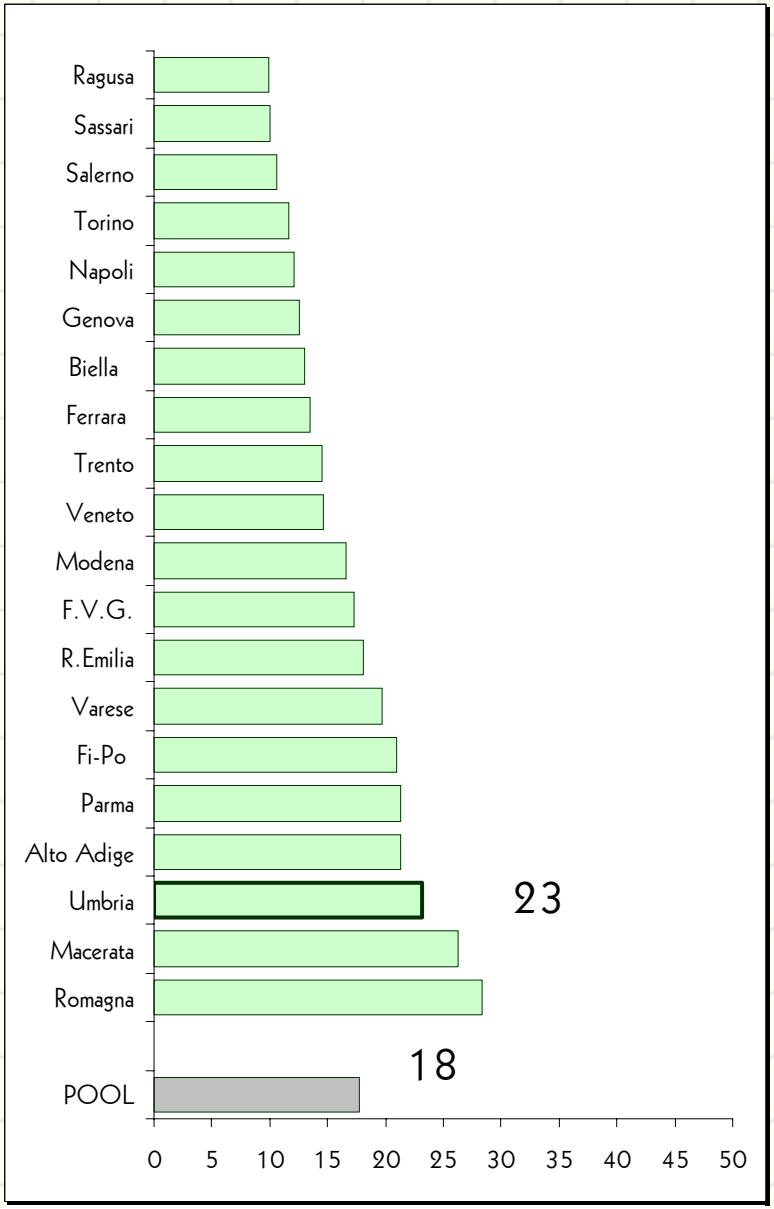


Incidenza (periodo 1998-2002)

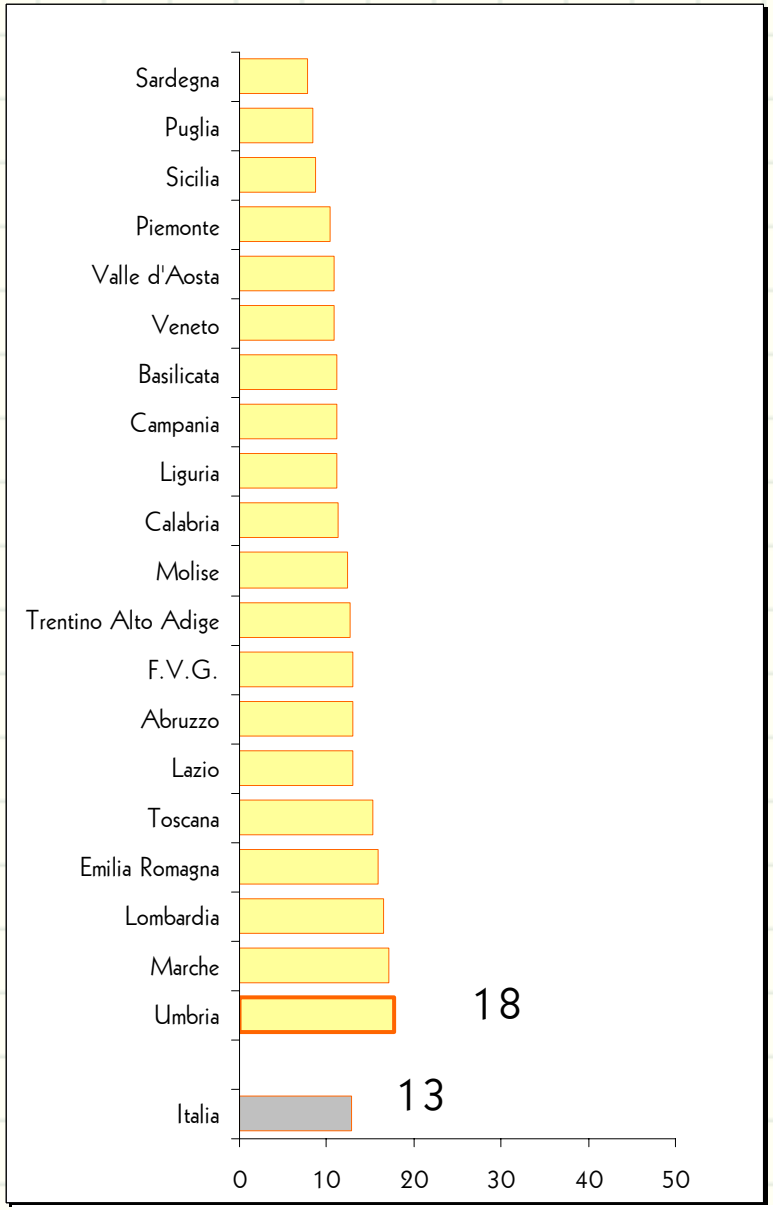


Mortalità (periodo 2000-2001)

Cancro dello stomaco - Femmine. Tassi standardizzati per 100.000 ab. per anno

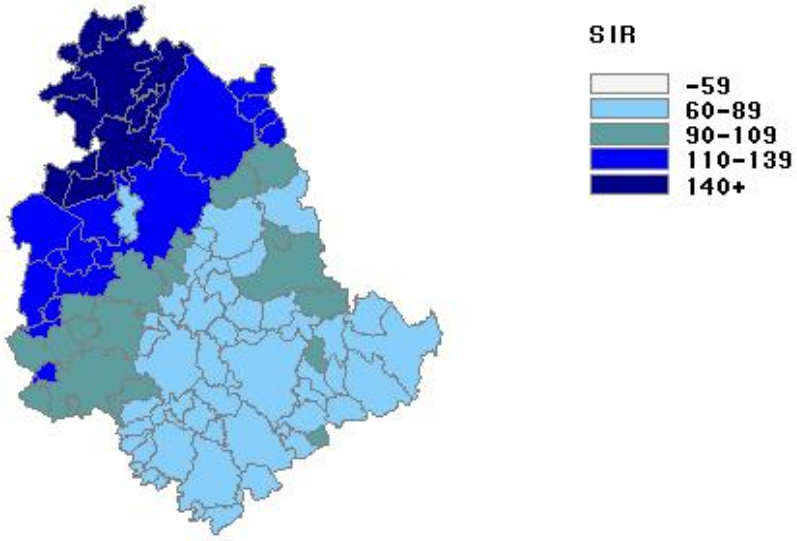


Incidenza (periodo 1998-2002)



Mortalità (periodo 2000-2001)

1994-1998



1978-1982

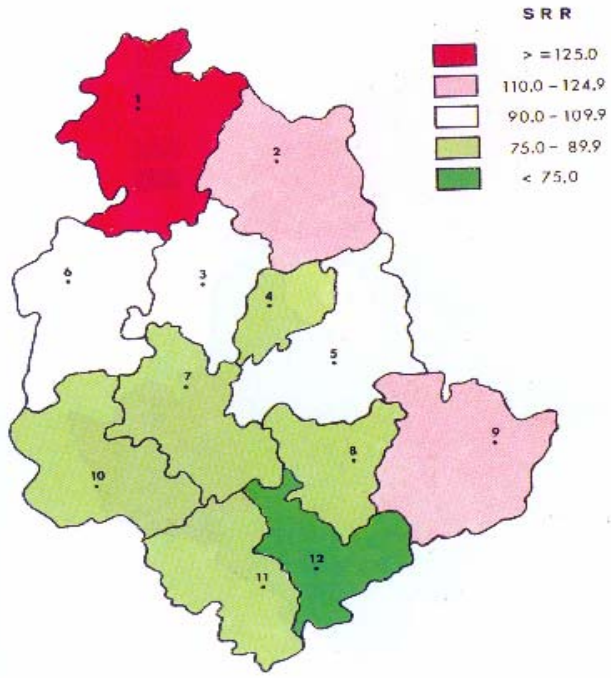
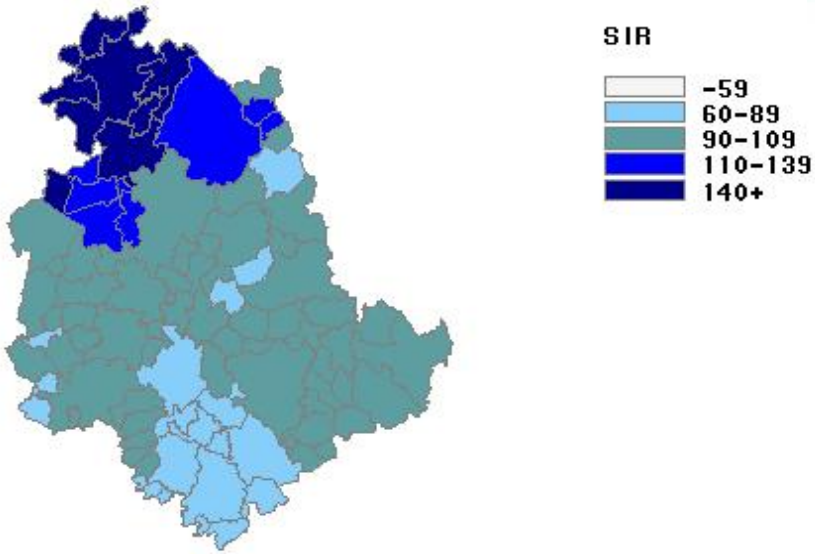


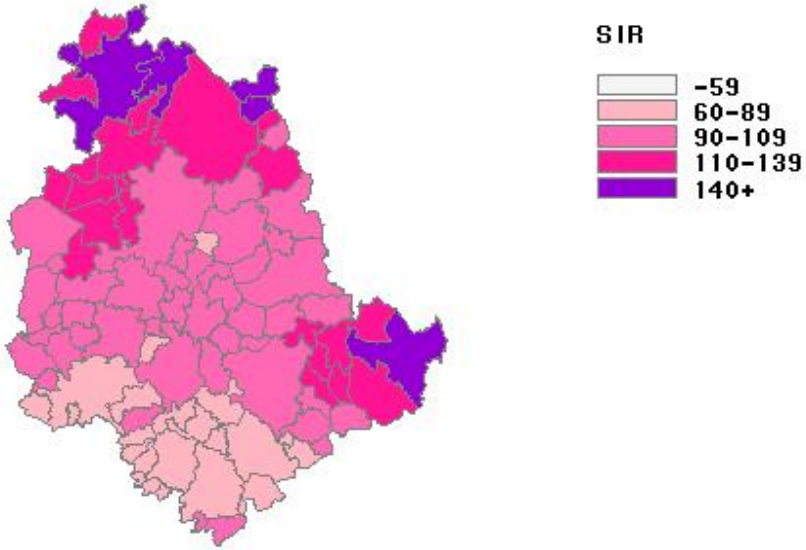
Figura 13. Incidenza per tumori maligni dello stomaco in Umbria. Maschi. 1978-82.
Incidence of stomach cancer in the Umbria region. Males. 1978-82.

Cancro dello stomaco - Maschi - Distribuzione regionale

1999-2003



1994-1998



1978-1982

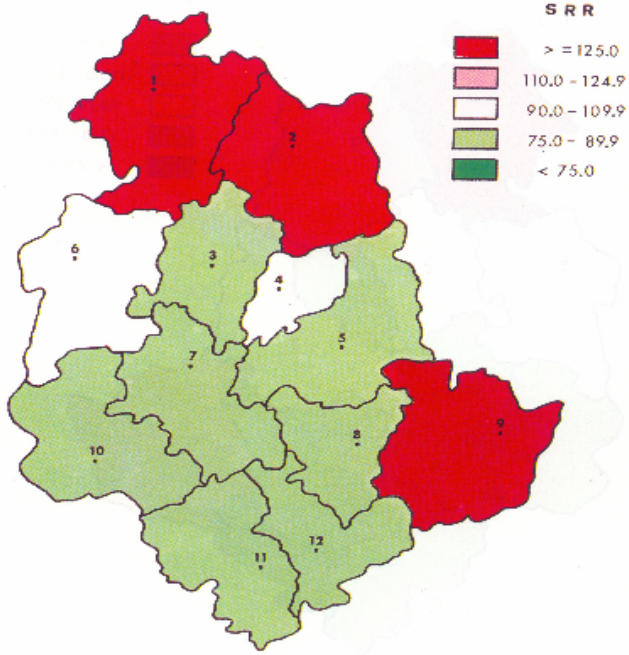
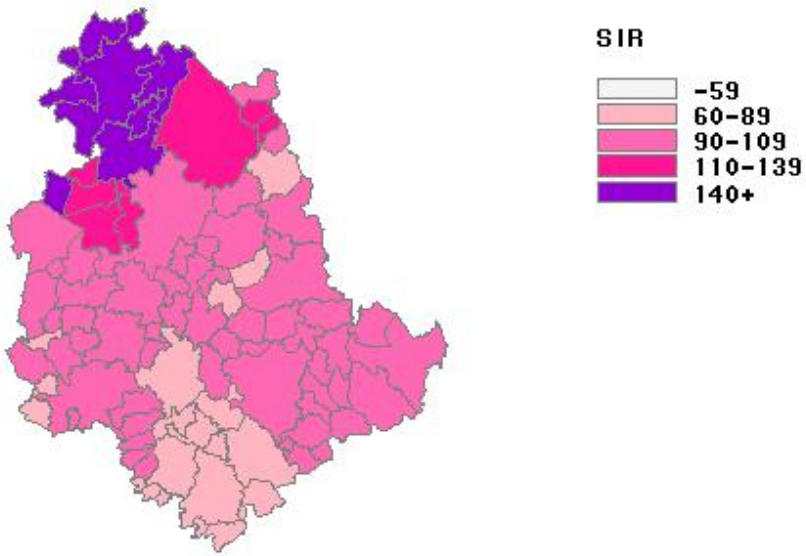


Figura 14. Incidenza per tumori maligni dello stomaco in Umbria. Femmine. 1978-82.
Incidence of stomach cancer in the Umbria region. Females. 1978-82.

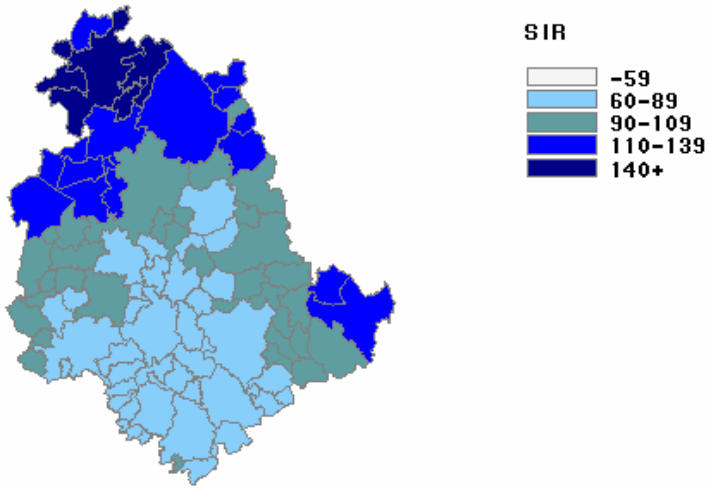
Cancro dello stomaco - Femmine - Distribuzione regionale

1999-2003

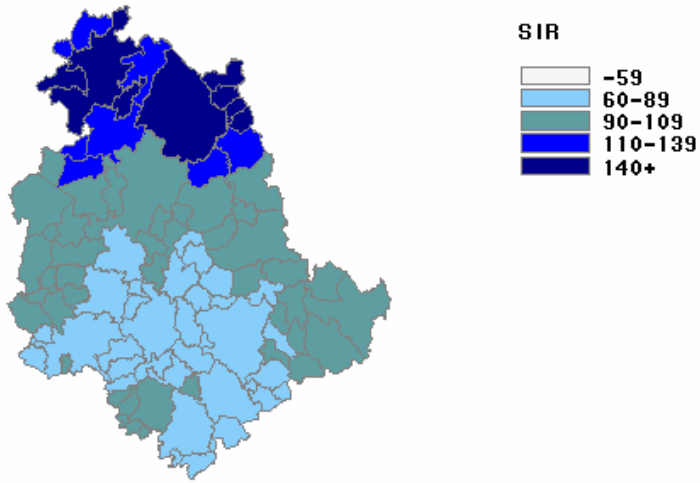


Cancro delle vie aerodigestive superiori - Maschi - Distribuzione regionale

1994-1998

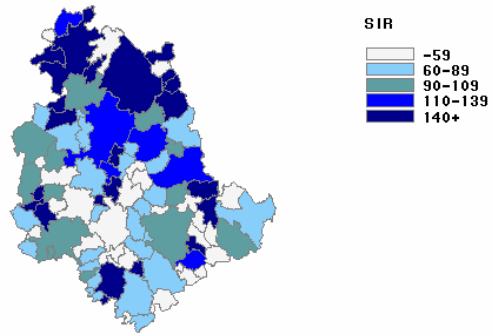


1999-2003



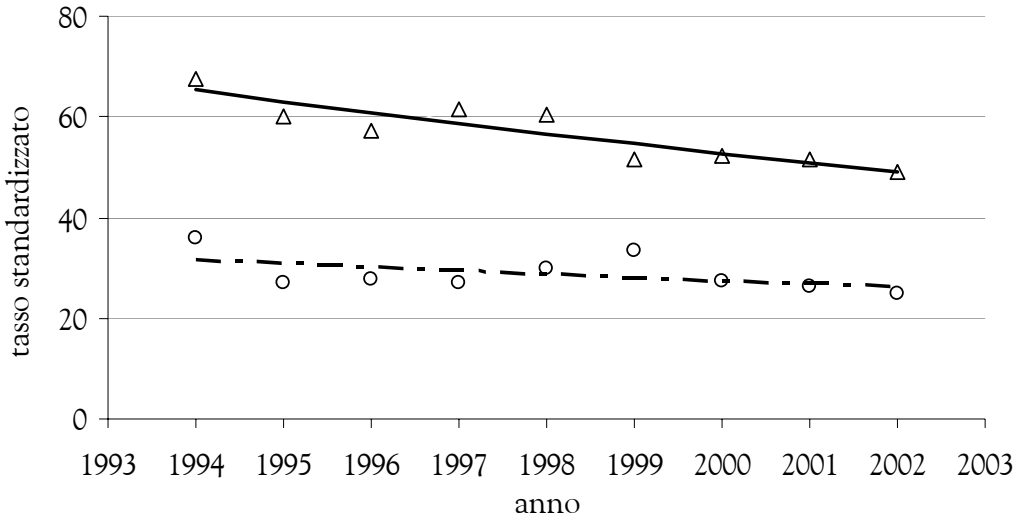
Come per lo stomaco, si osserva un'area ad elevata incidenza nella zona nord della regione

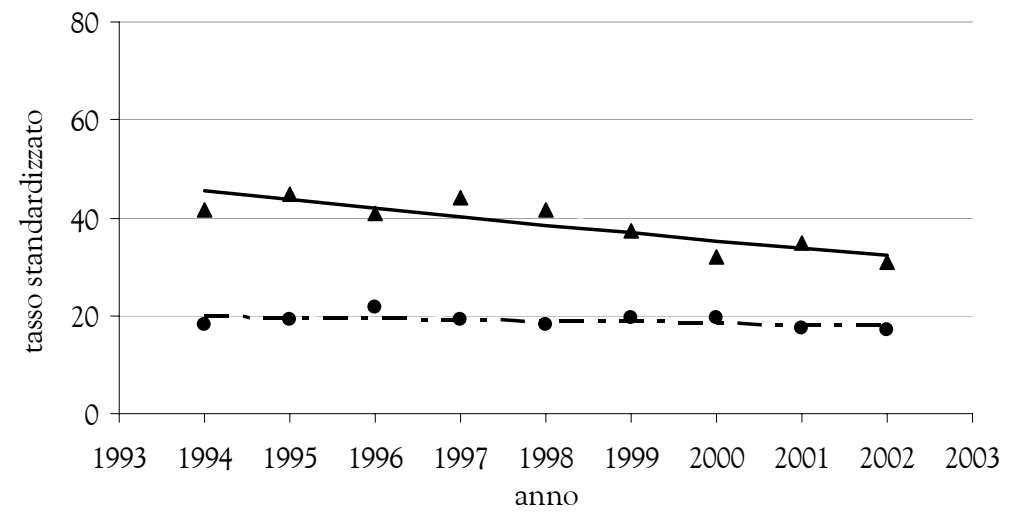
Interventi di prevenzione potrebbero essere relativamente più semplici



Mappa con i SIR osservati

Trend temporale del cancro dello stomaco (1994-2002)





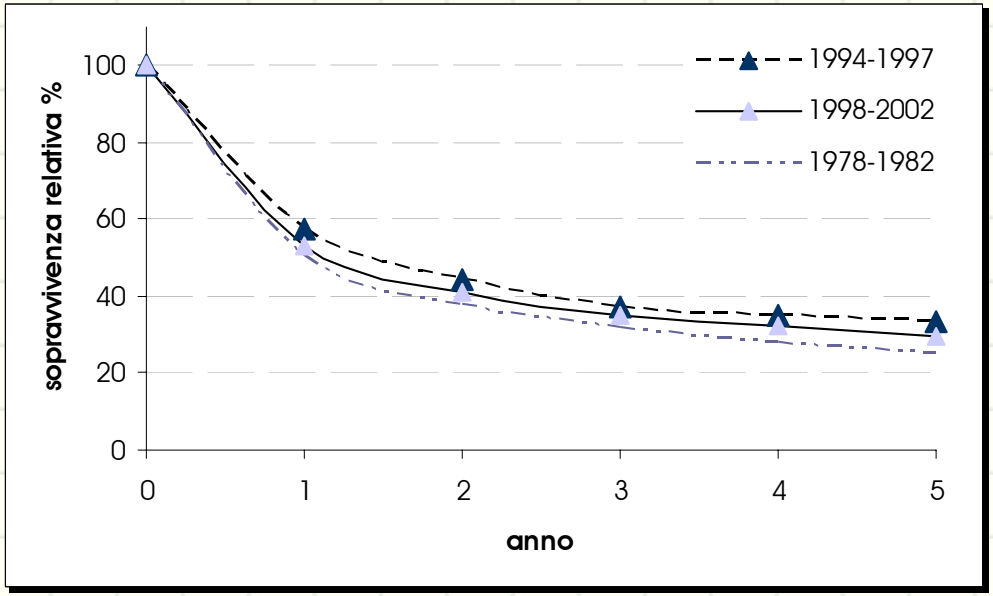
Incidenza.

Maschi + tasso osservato;
linea: stimato analisi joinpoint (jp=0),
EAPC –3.5
(95%IC da –4.9 a –2.0).
Femmine,) tasso osservato;
linea tratteggiata: joinpoint (jp=0),
EAPC –2.3
(95%IC da –5.7 a 1.1)

Mortalità

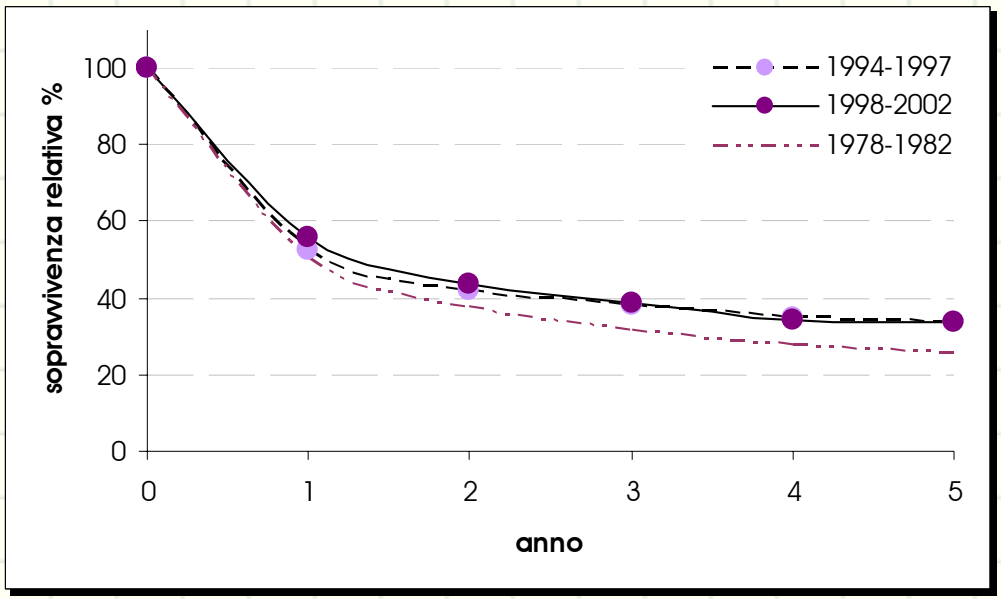
Maschi % tasso osservato;
linea cintinua joinpoint
EAPC –4.2
(95%IC da –6.3 a –1.9).
Femmine, # tasso osservato;
linea tratteggiata: joinpoint
EAPC –1.2
(95%IC da –3.5 a 1.1)

Sopravvivenza relativa a 5 anni per cancro dello stomaco per sesso e periodo



Maschi

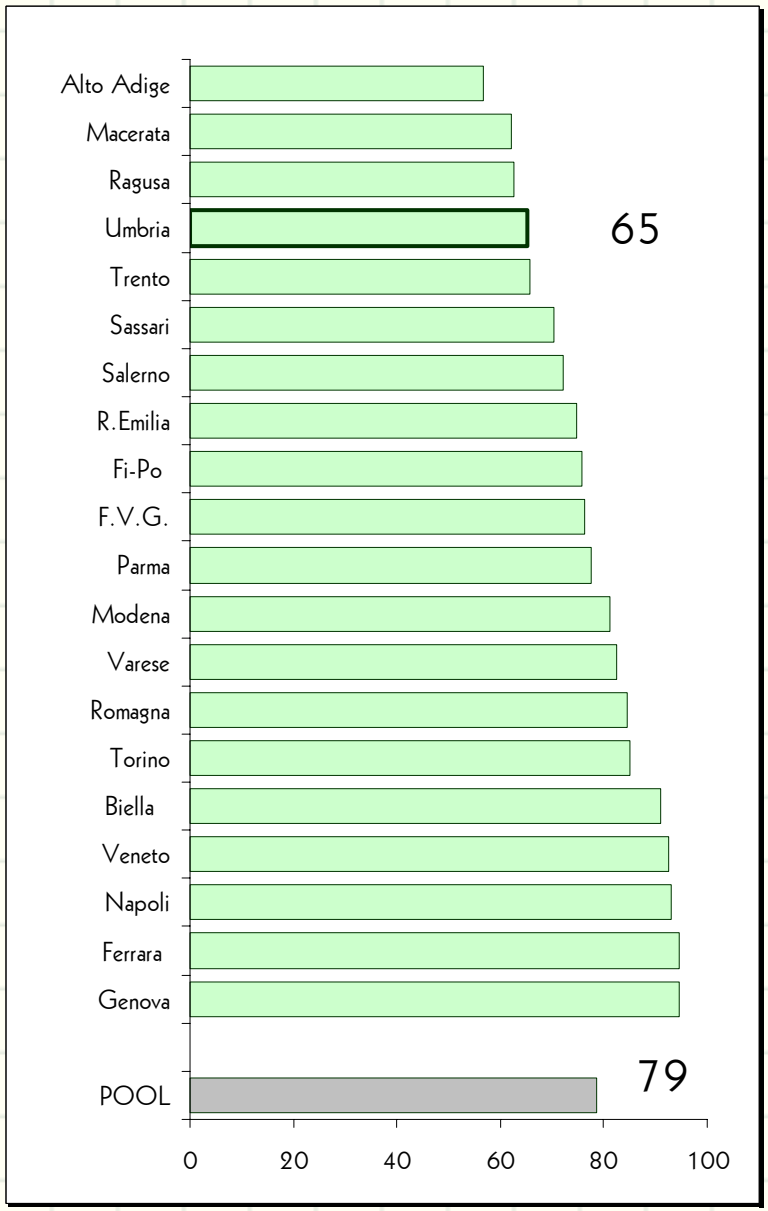
Periodo	*sopravvivenza a 5a*
1978-82:	*25%*
1994-98:	29%
1999-02:	34%



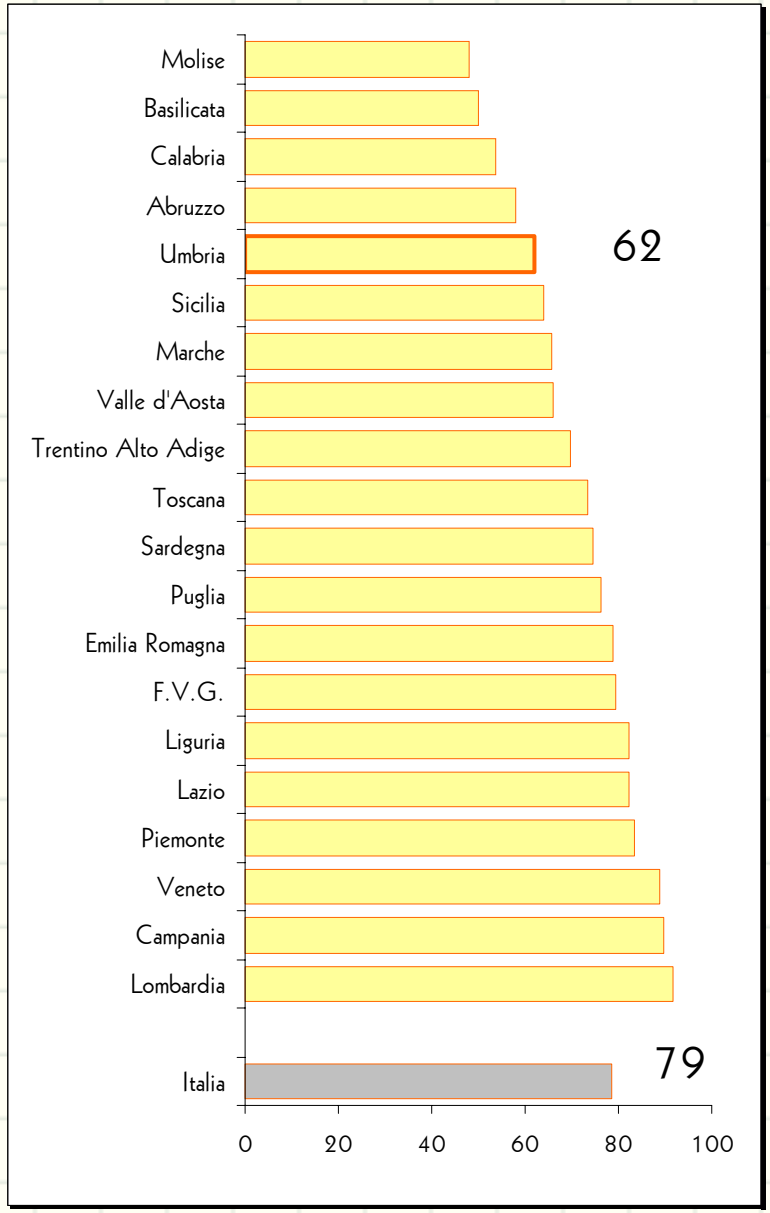
Femmine

Periodo	*sopravvivenza a 5a*
1978-82:	*25%*
1994-98:	34%
1999-02:	34%

Cancro del polmone - Maschi . Tassi standardizzati per 100.000 ab. Per anno

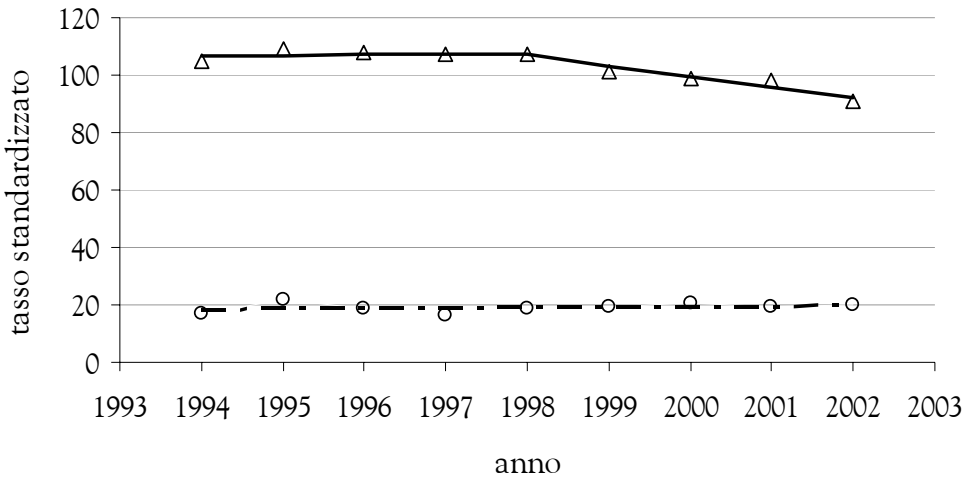


Incidenza (periodo 1998-2002)



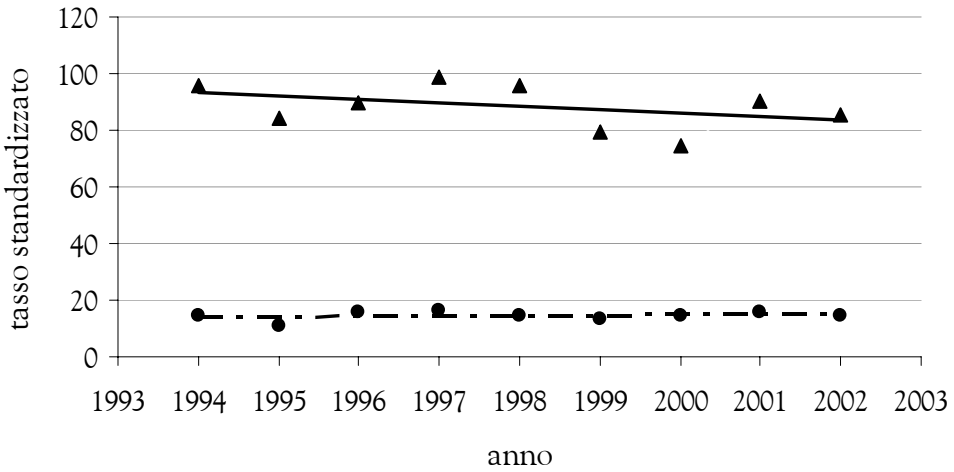
Mortalità (periodo 2000-2001)

Trend temporale del cancro del polmone



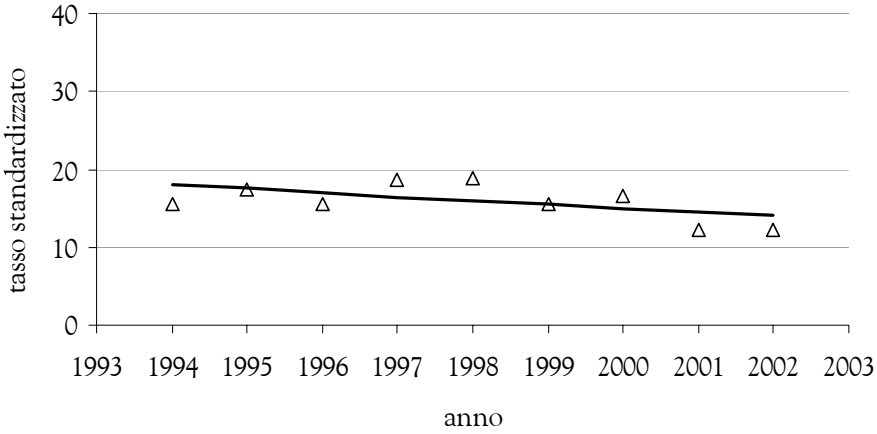
Incidenza

Maschi + tasso osservato;
linea: trend stimato analisi joinpoint (jp=1; anno 1998),
EAPC1 +0.1
(95%IC da –2.4 a 2.7),
EAPC2 –3.7
(95%IC da –6.2 a –1.1)
Femmine,) tasso osservato;
linea tratteggiata: trend stimato (jp=0),
EAPC +0.9
(95%IC da –1.9 a 3.8)

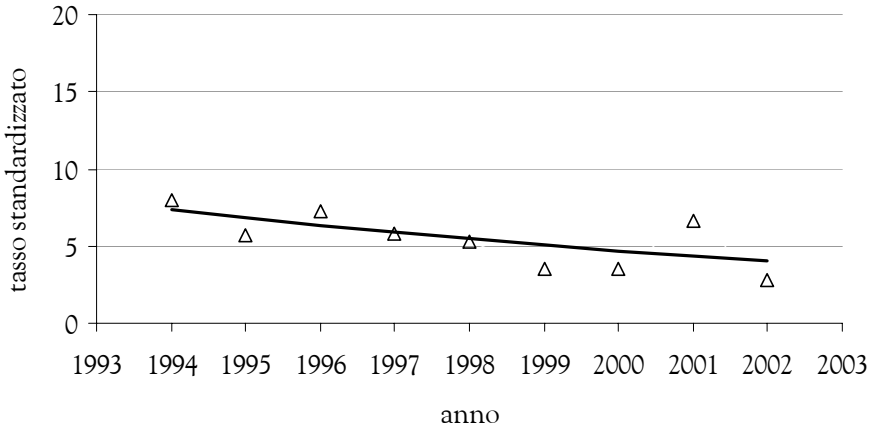


Mortalità

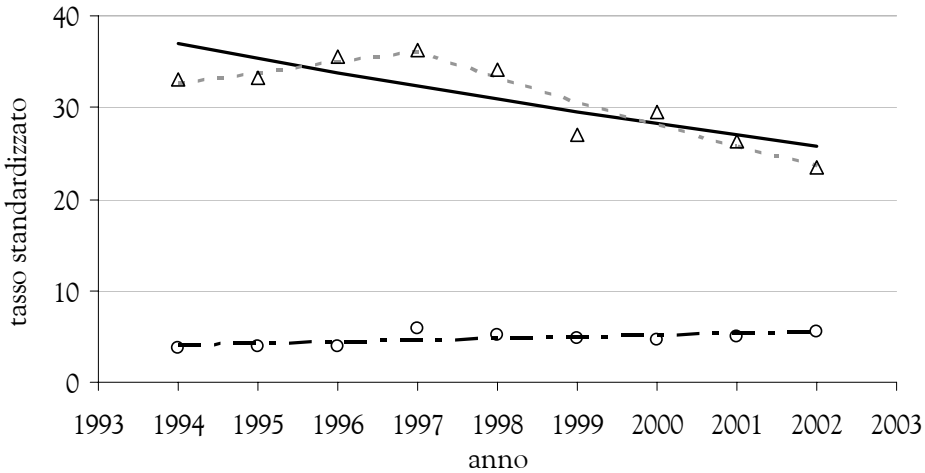
Maschi % tasso osservato; linea: trend stimato (jp=0),
EAPC –1.4
(95%IC da –4.0 a 1.4).
Femmine, # tasso osservato; linea tratteggiata: trend stimato (jp=0),
EAPC +1.1
(95%IC da –2.5 a 4.8)



Laringe maschi incidenza EAPC -3.1

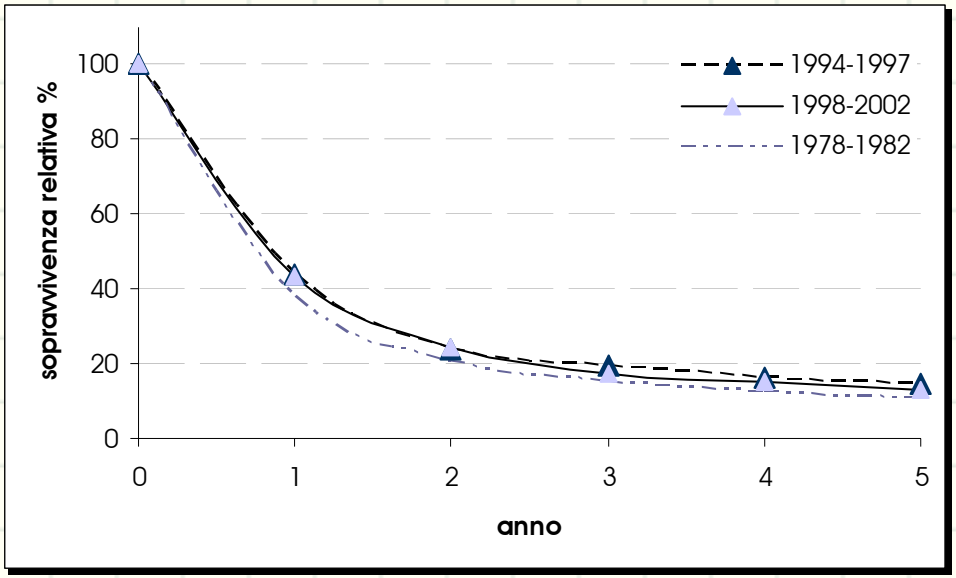


Esofago maschi incidenza EAPC -7.3



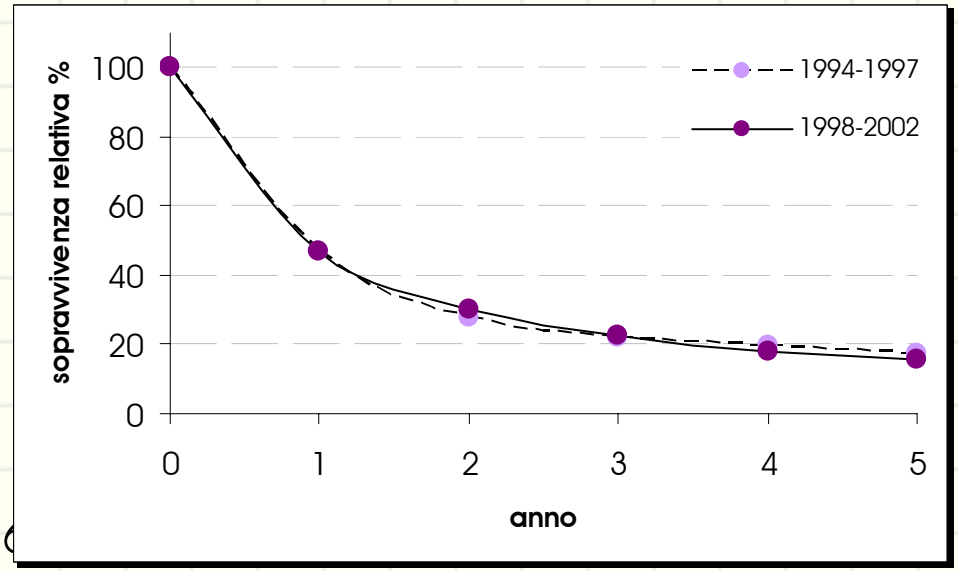
VADS maschi incidenza EAPC -4.3
femmine EAPC +3.7

Sopravvivenza relativa a 5 anni per cancro del polmone per sesso e periodo



Maschi

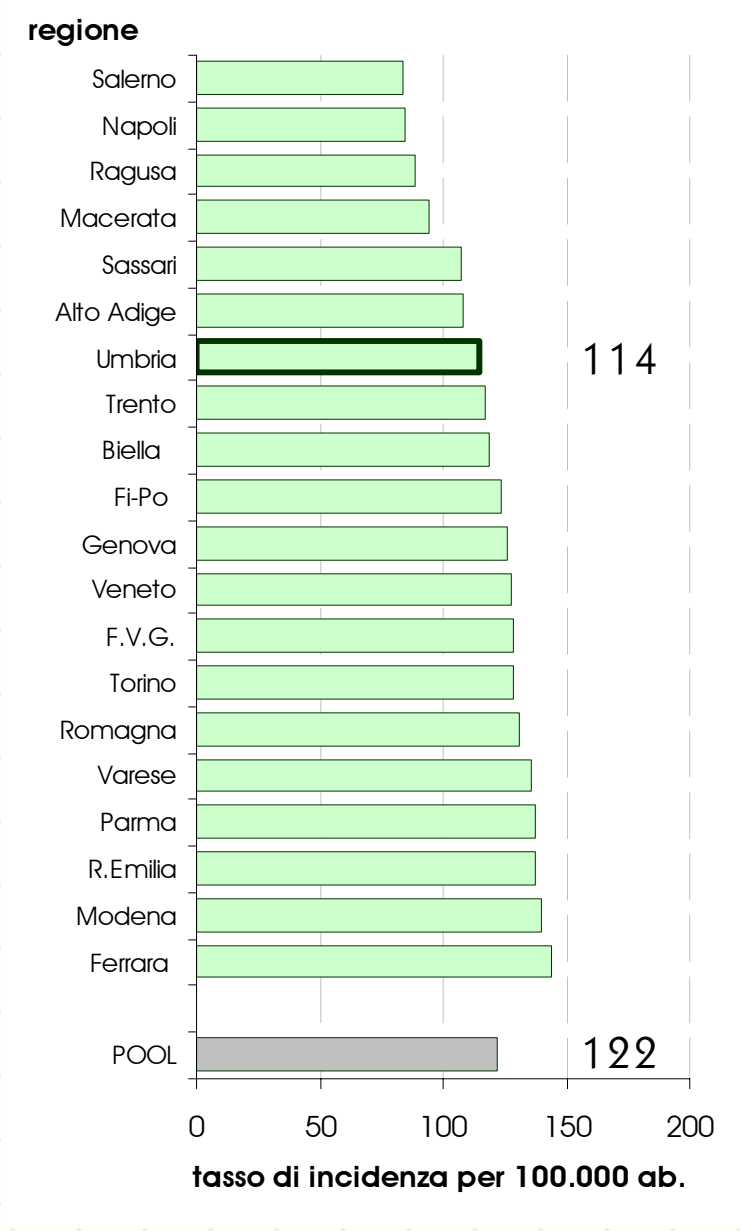
Periodo	*sopravvivenza a 5a*
1978-82:	*11%*
1994-98:	15%
1999-02:	13%

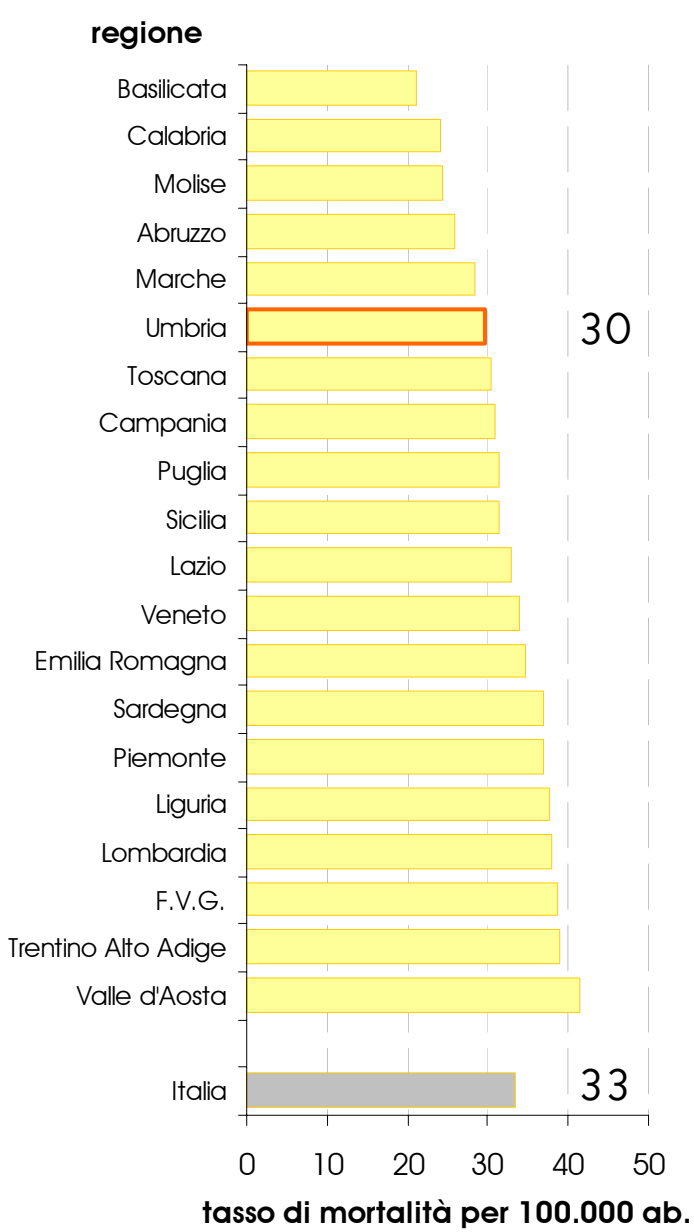


Femmine

Periodo	*sopravvivenza a 5a*
1994-98:	17%
1999-02:	16%

Cancro della mammella . Tassi standardizzati per 100.000 ab. Per anno



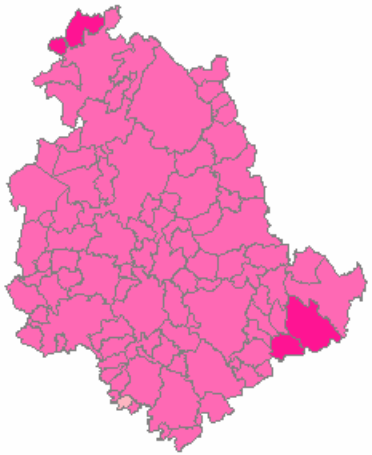


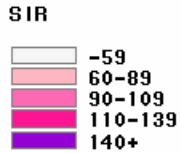
Incidenza (periodo 1998-2002)

Mortalità (periodo 2000-2001)

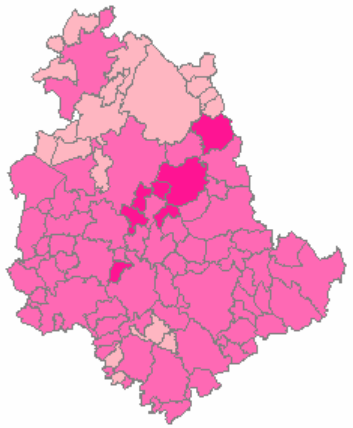
Cancro della mammella - Distribuzione regionale

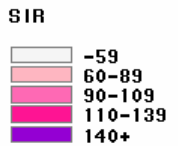
1994-1998





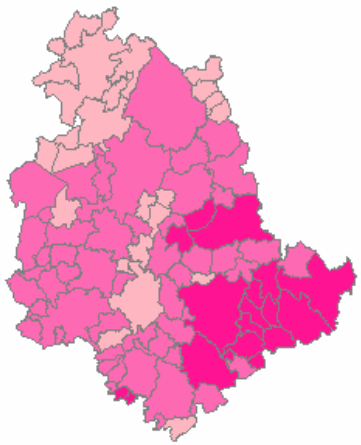
Tutte le età

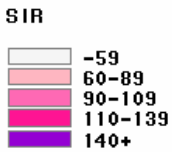


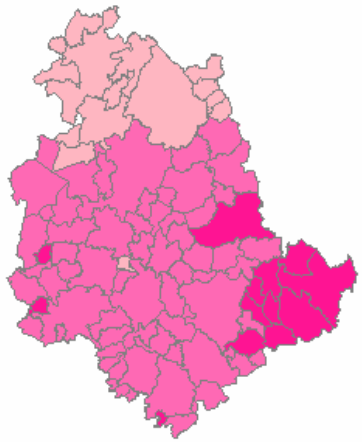


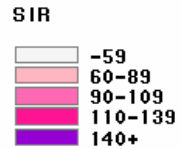
50-69 anni

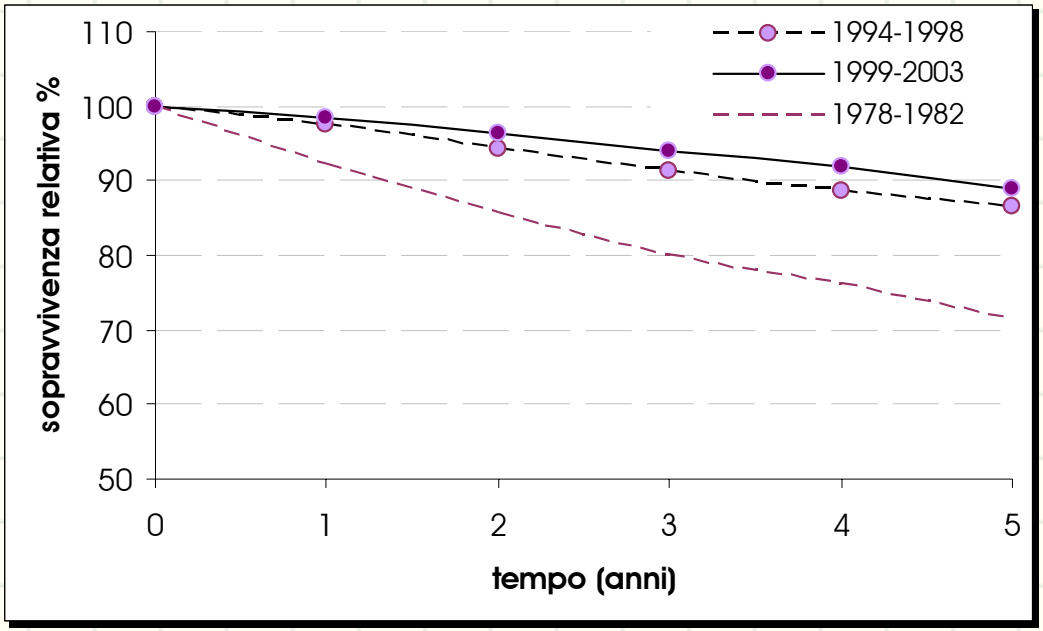
1999-2003





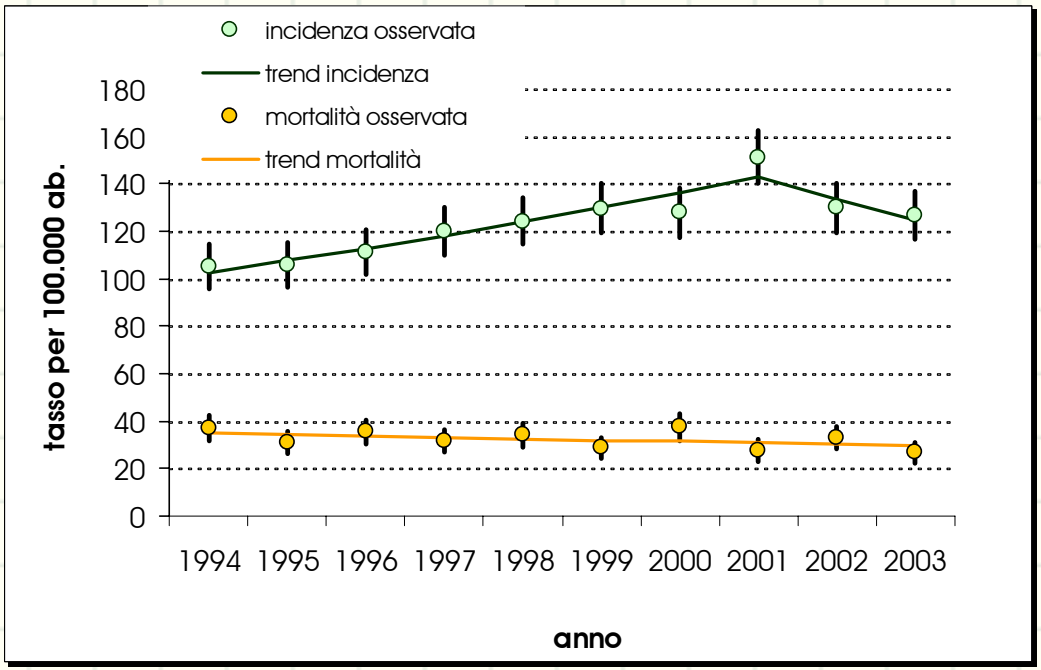






Sopravvivenza relativa

Periodo	*sopravvivenza a 5a*
1978-1982:	*71%*
1994-1998:	86%
1999-2003:	89%



Trend di incidenza e mortalità:

EAPC **incidenza:**

1994-2001: + 4.8
(95% IC +3.5 +6.2);

2001-2003: – 6.5
(95% IC -14.4 +2.1)

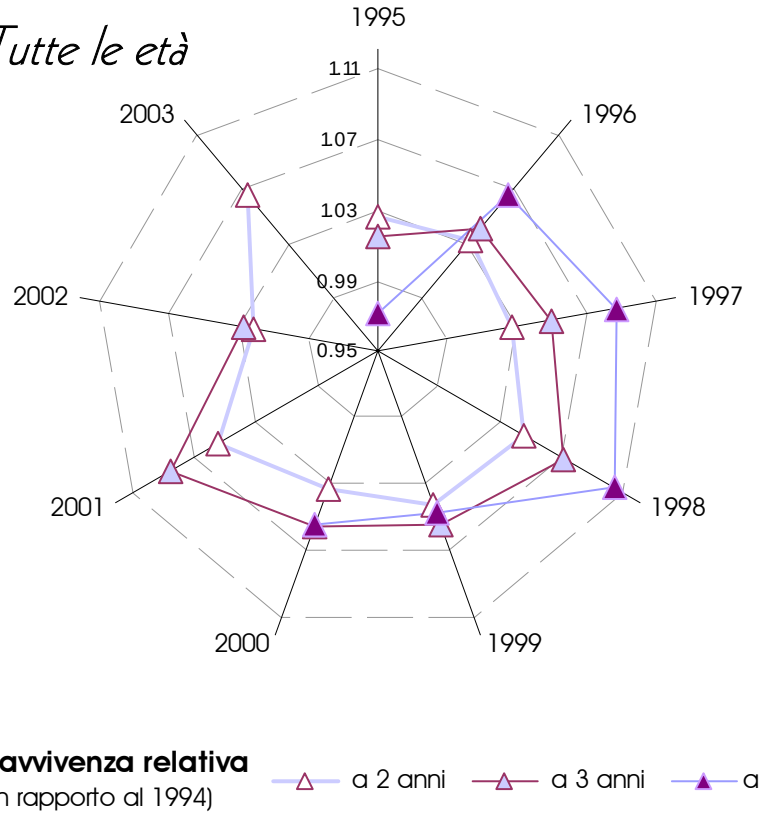
EAPC **mortalità:**

1994-2003: – 1.9
(95% IC -4.6 +0.9)

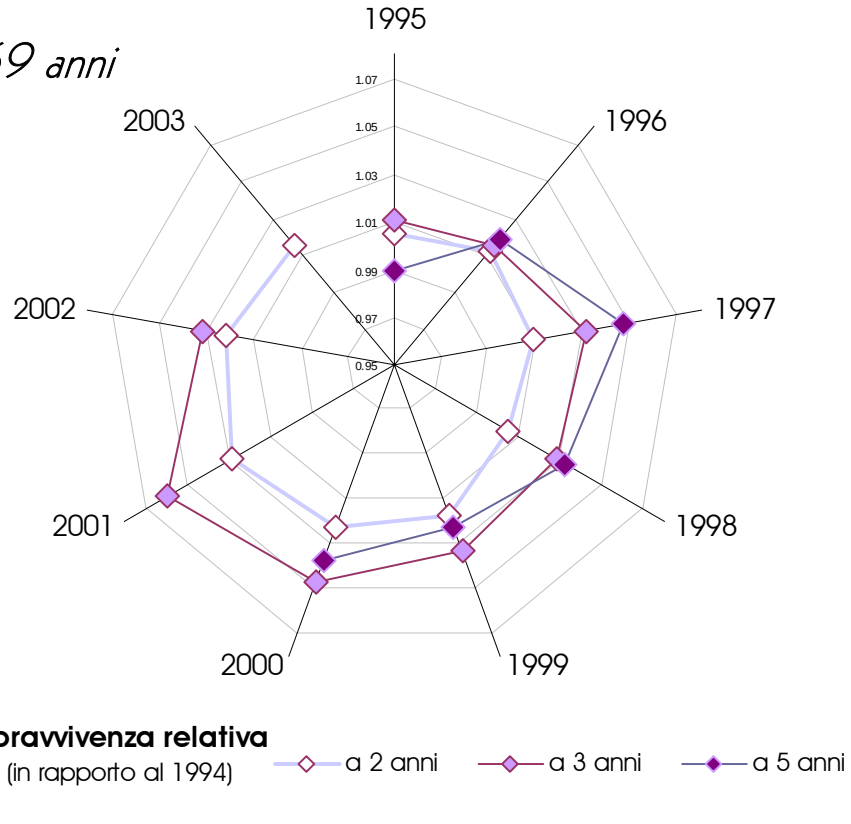
Somigliano ad un guscio di lumaca?

Rapporto tra probabilità di sopravvivenza per anno

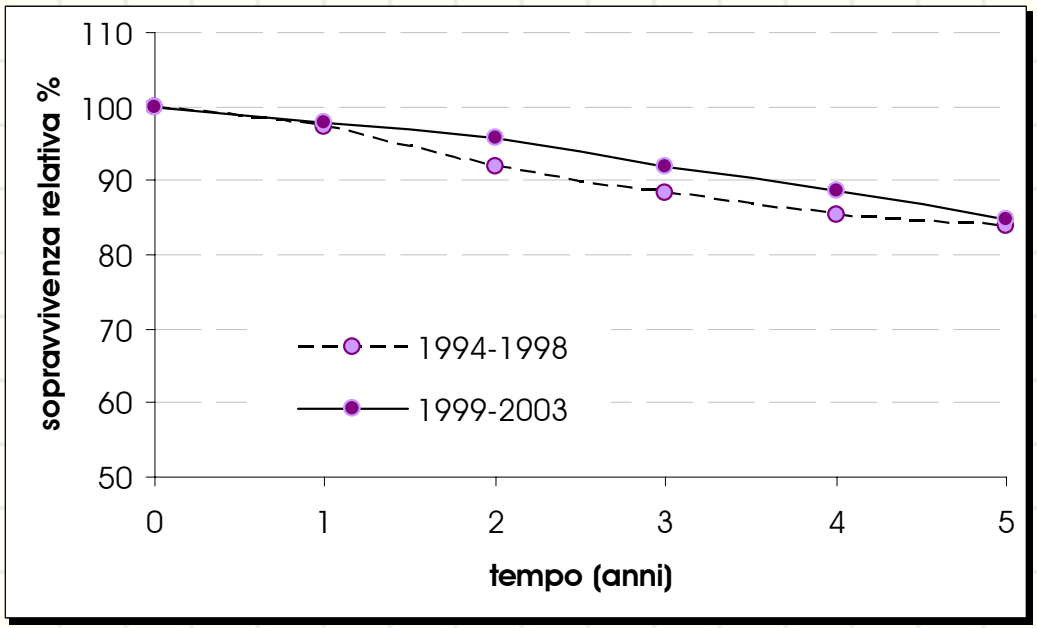
Tutte le età



50-69 anni

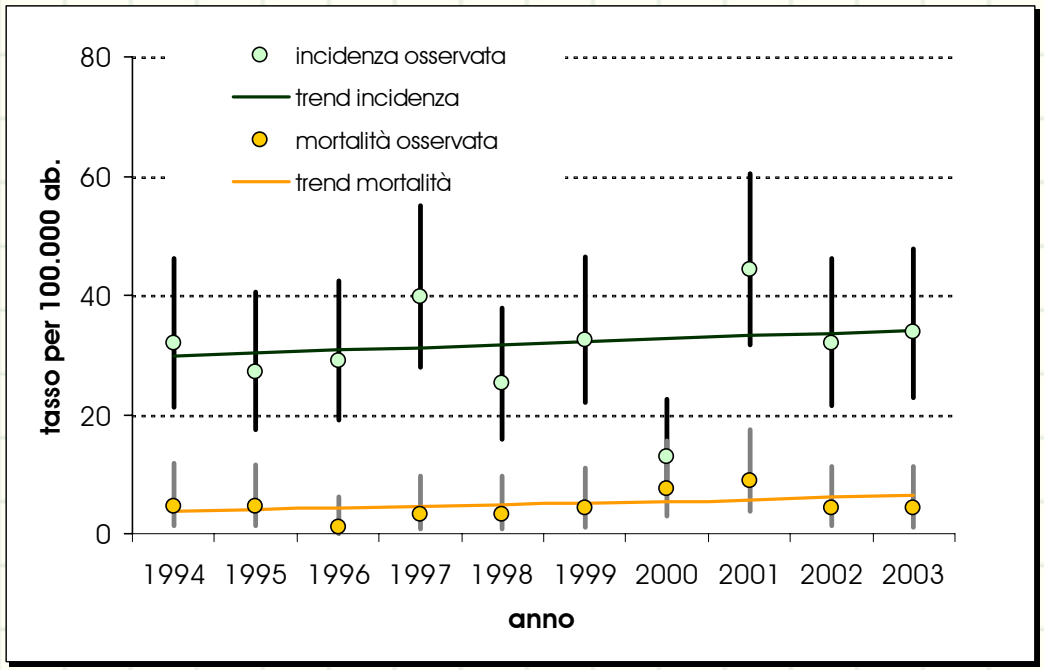


Età <40 anni



Sopravvivenza relativa

Periodo	*sopravvivenza a 5a*
1994-1998:	84%
1999-2003:	85%



Trend di incidenza e mortalità :

EAPC incidenza:

1994-2003: +1.5

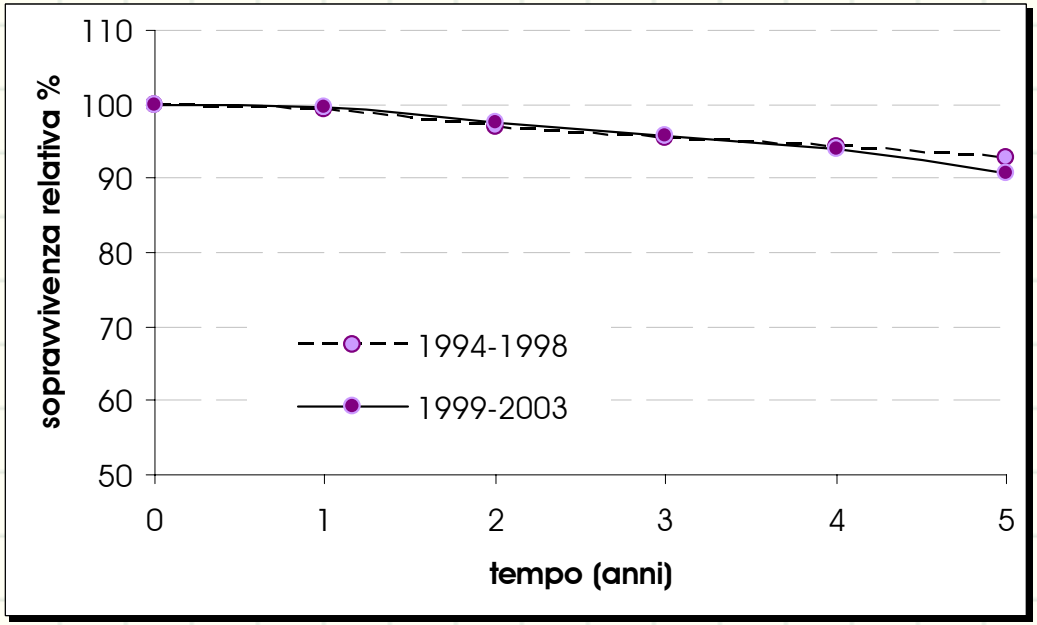
(95% IC -5.4 +8.9)

EAPC mortalità:

1994-2003: +6.3

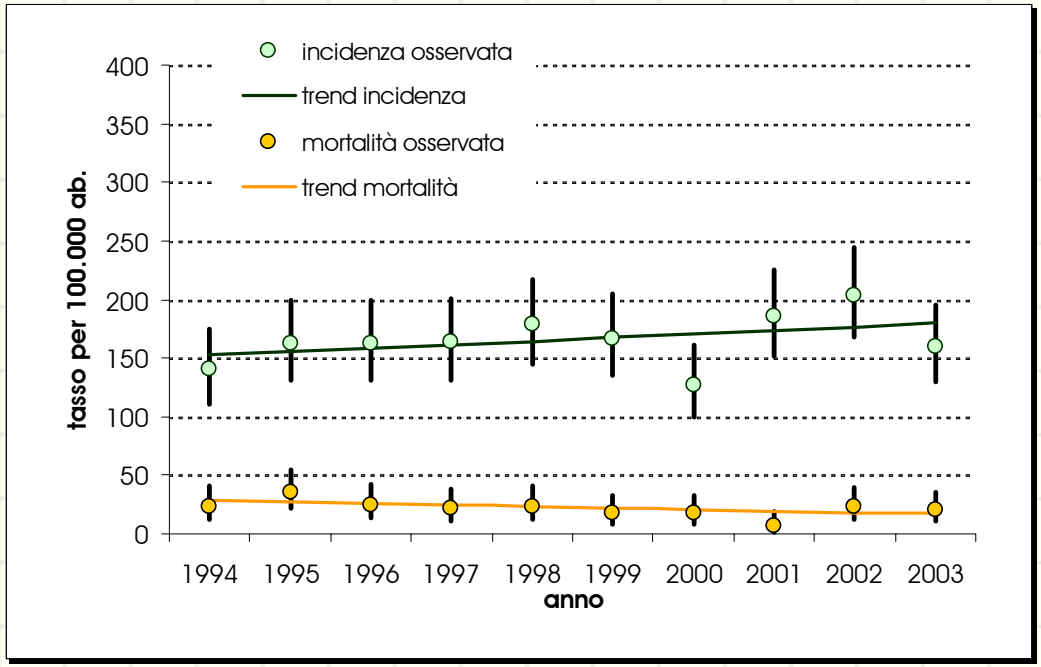
(95% IC -5.0 +18.8)

Età 40-49 anni



Sopravvivenza relativa

Periodo	*sopravvivenza a 5a*
1994-1998:	93%
1999-2003:	91%



Trend di incidenza e mortalità :

EAPC **incidenza:**

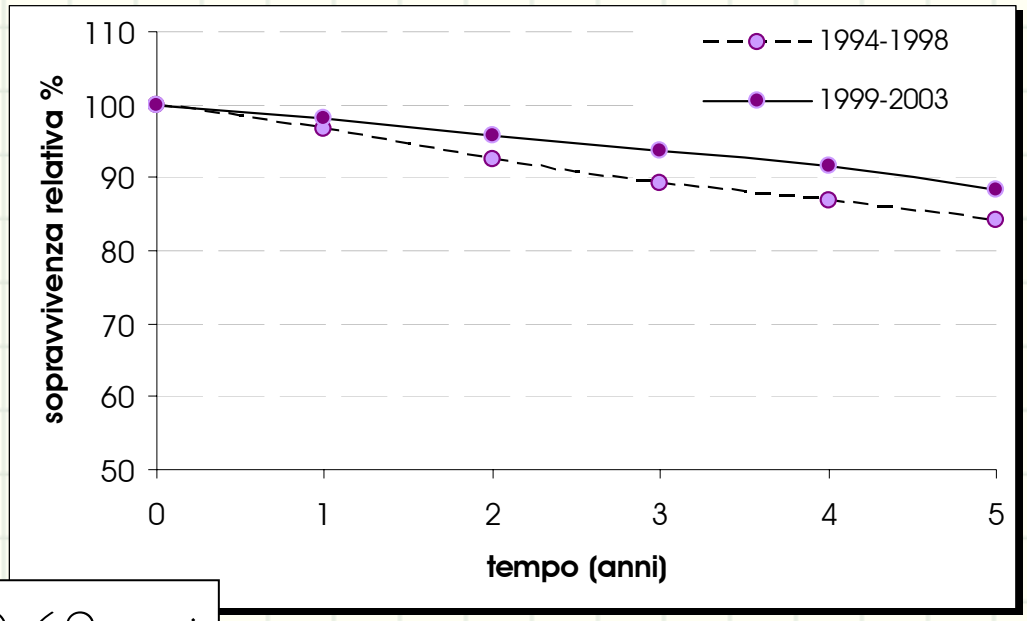
1994-2003: +1.8

(95% IC -1.4 +5.1)

EAPC **mortalità:**

1994-2003: -5.5

(95% IC -11.8 +1.3)

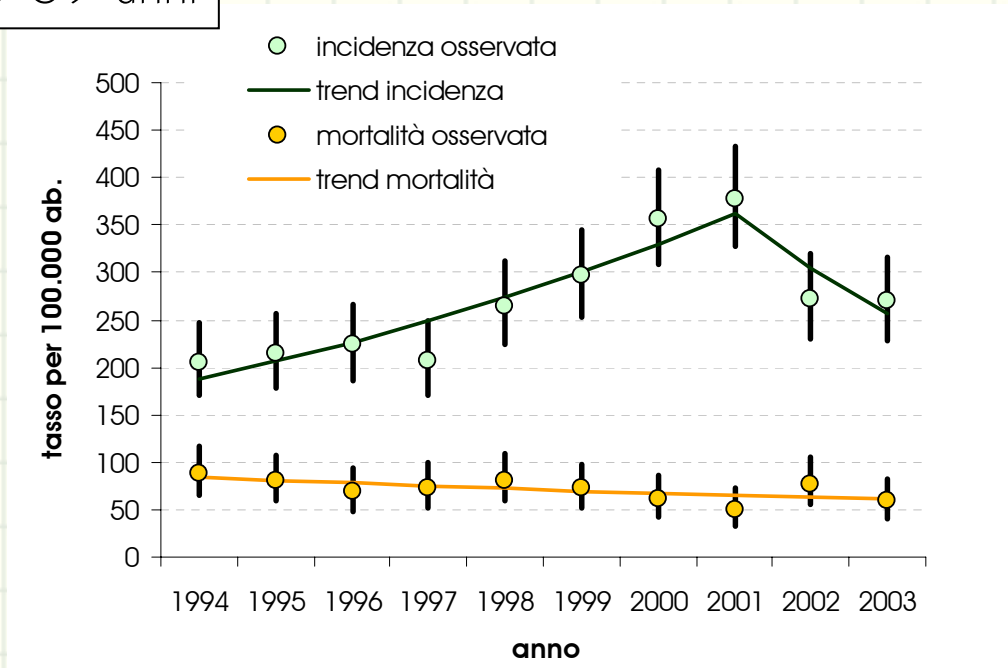


Età 50-69 anni

Sopravvivenza relativa

Periodo	*sopravvivenza a 5a*	
	50-59	60-69
1994-1998:	87%	84%
1999-2003:	90%	88%

60-69 anni



Trend di incidenza e mortalità :

EAPC **incidenza:**

1994-2001:+7.9

(95% IC +5.6 +10.2);

2001-2003: -10.4

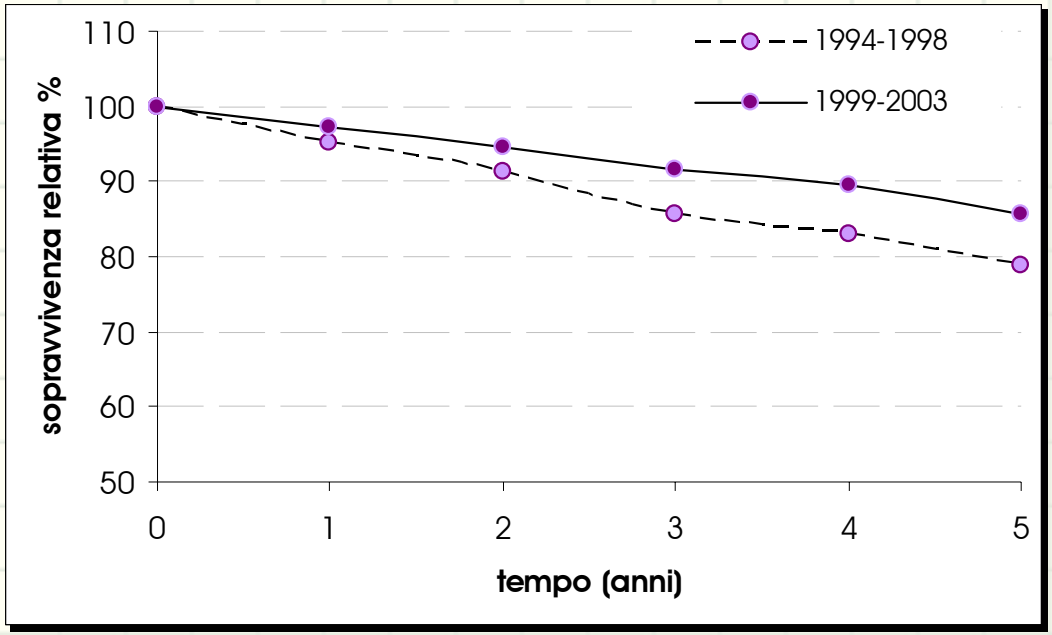
(95% IC -23.0 +4.2)

EAPC **mortalità:**

1994-2003: -3.0

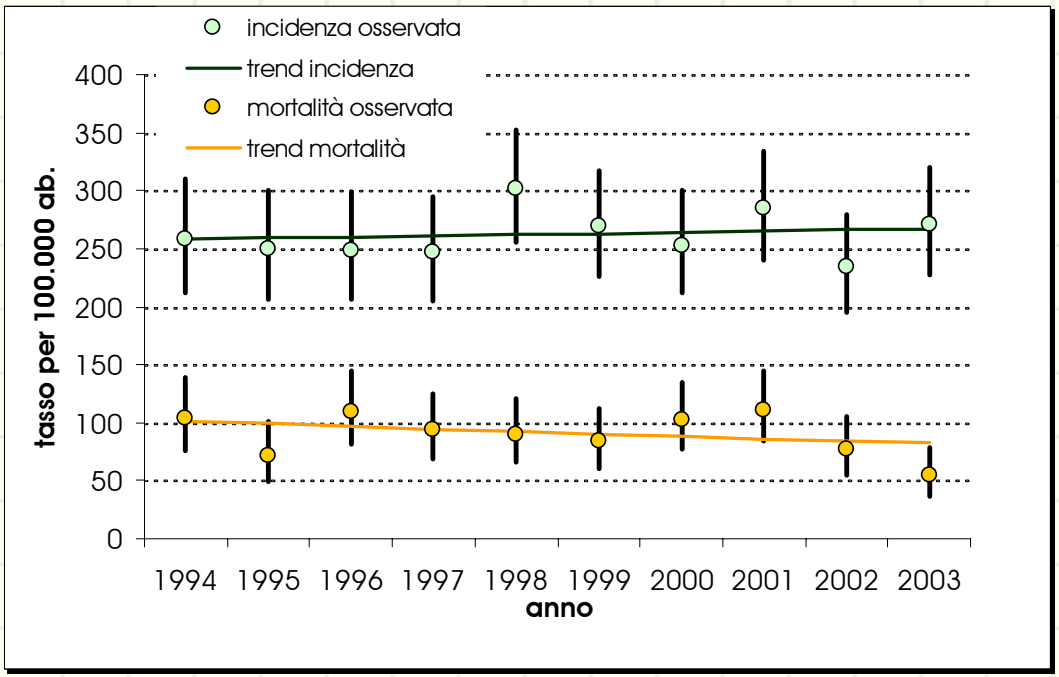
(95% IC -6.4 +0.6)

Età 70-79 anni



Sopravvivenza relativa

Periodo	*sopravvivenza a 5a*
1994-1998:	79%
1999-2003:	87%



Trend di incidenza e mortalità :

EAPC **incidenza:**

1994-2003: +0.4

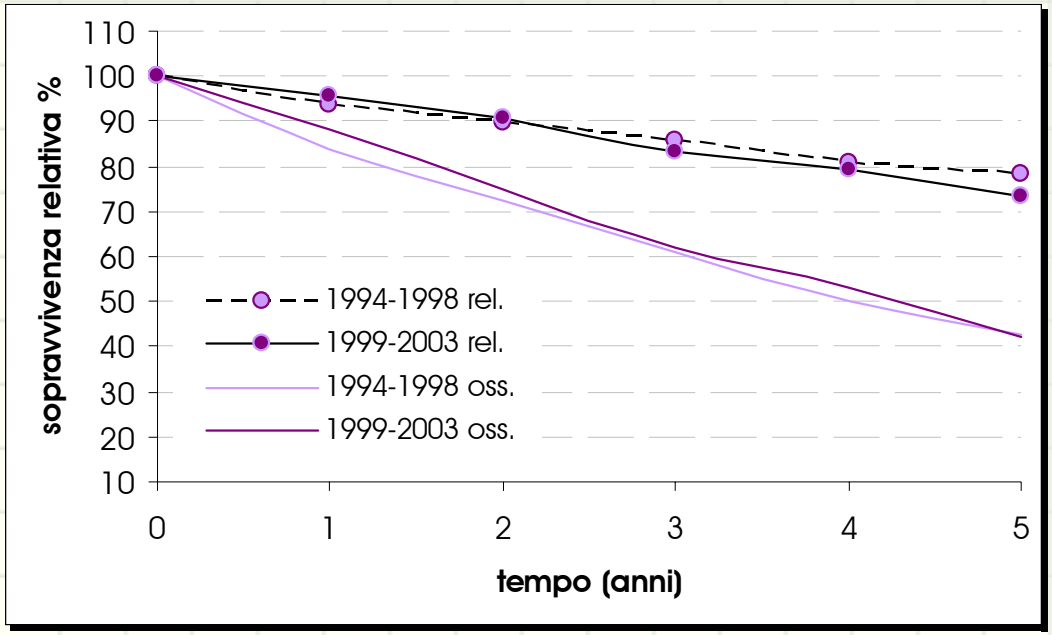
(95% IC -1.7 +2.5)

EAPC **mortalità:**

1994-2003: -2.3

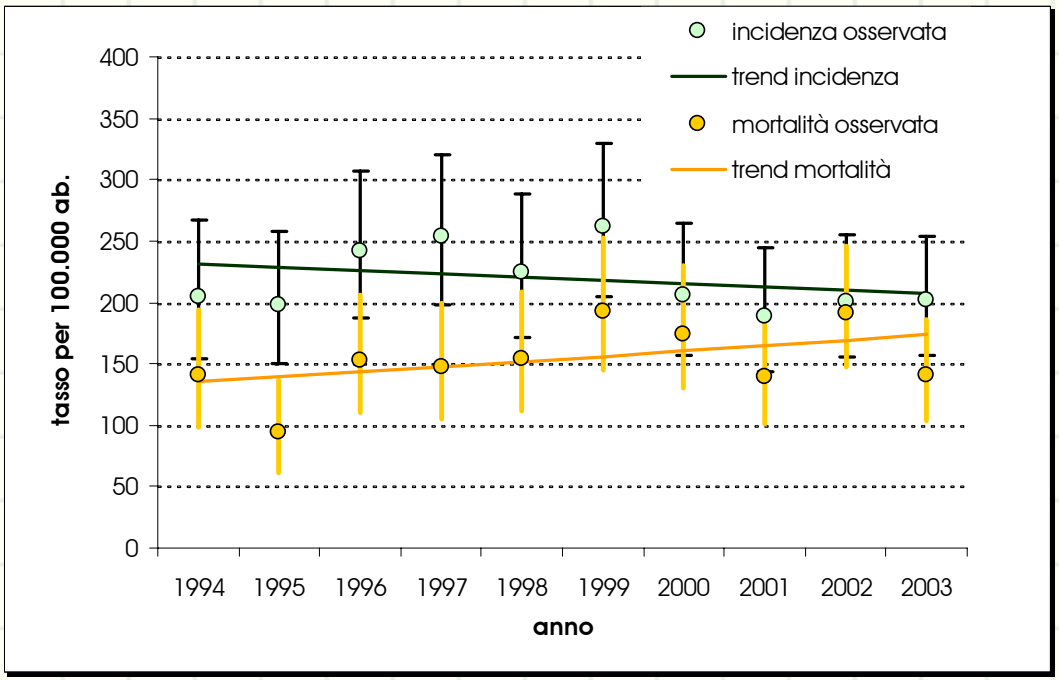
(95% IC -7.4 +3.2)

Età >=80 anni



Sopravvivenza relativa

Periodo	*sopravvivenza a 5a*
1994-1998:	78%
1999-2003:	74%



Trend di incidenza e mortalità:

EAPC **incidenza:**

1994-2003: -1.3

(95% IC -4.2 +1.6)

EAPC **mortalità:**

1994-2003: +2.8

(95% IC -1.9 +7.7)

Identificazione dei Casi
fonte RTUP (1994-96 n. 1515; 1997-2001 n. 3229)

↓

Revisione interna dei dati disponibili
(anatomia patologica>estratti cartelle cliniche>sdo, rimborsi)

↓

Revisione esterna e controllo dei dati mancanti
(ap, radioterapia, oncologia, diagnostica per immagini, archivi personali, registri sala operatoria, altri)

↓

Incrocio con le prescrizioni farmaceutiche
(trattamenti specifici, in particolare trattamento ormonale)

↓

Incrocio con i dati di screening

↓

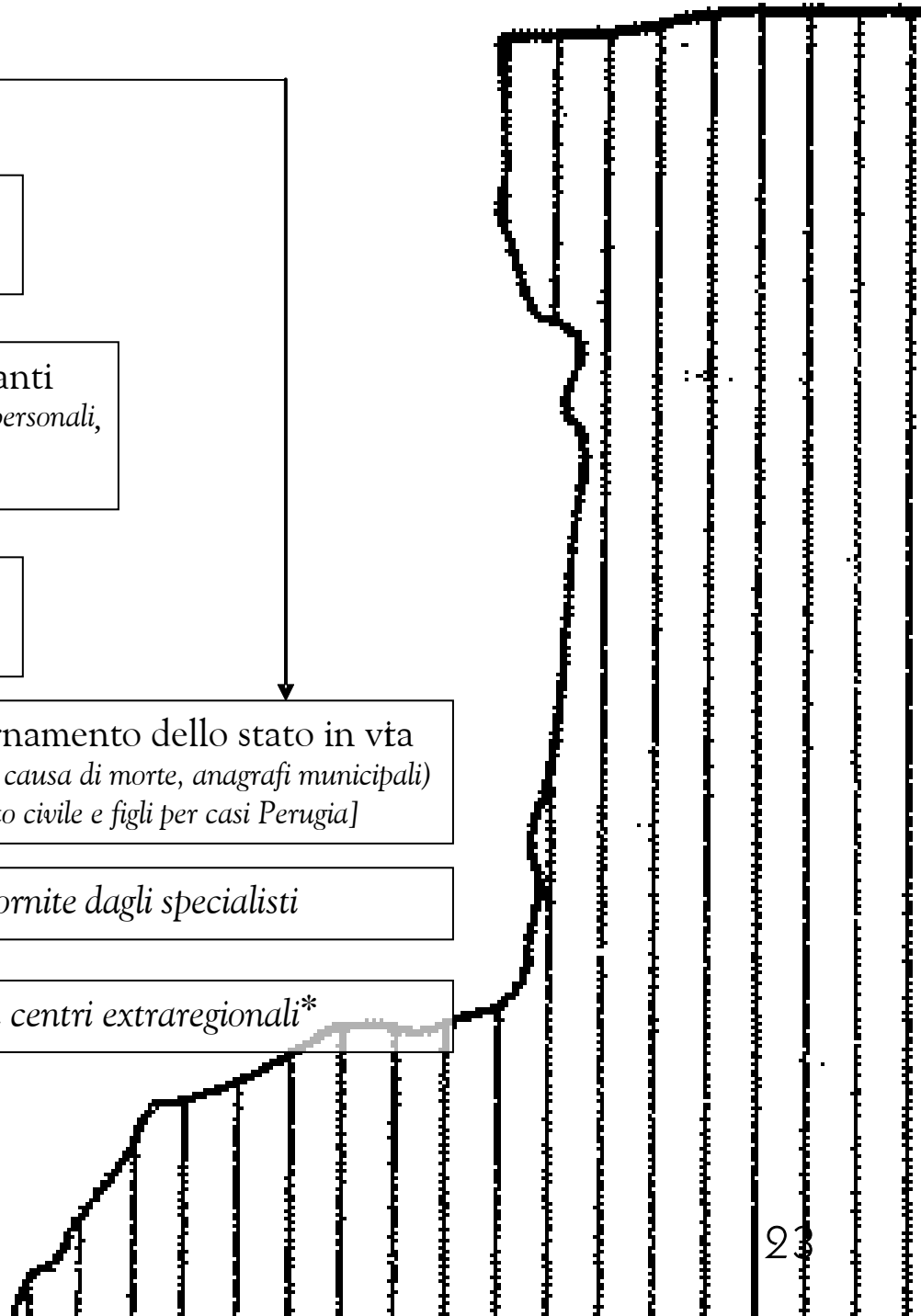
Aggiornamento dello stato in vita
(certificati causa di morte, anagrafi municipali)
[stato civile e figli per casi Perugia]

↓

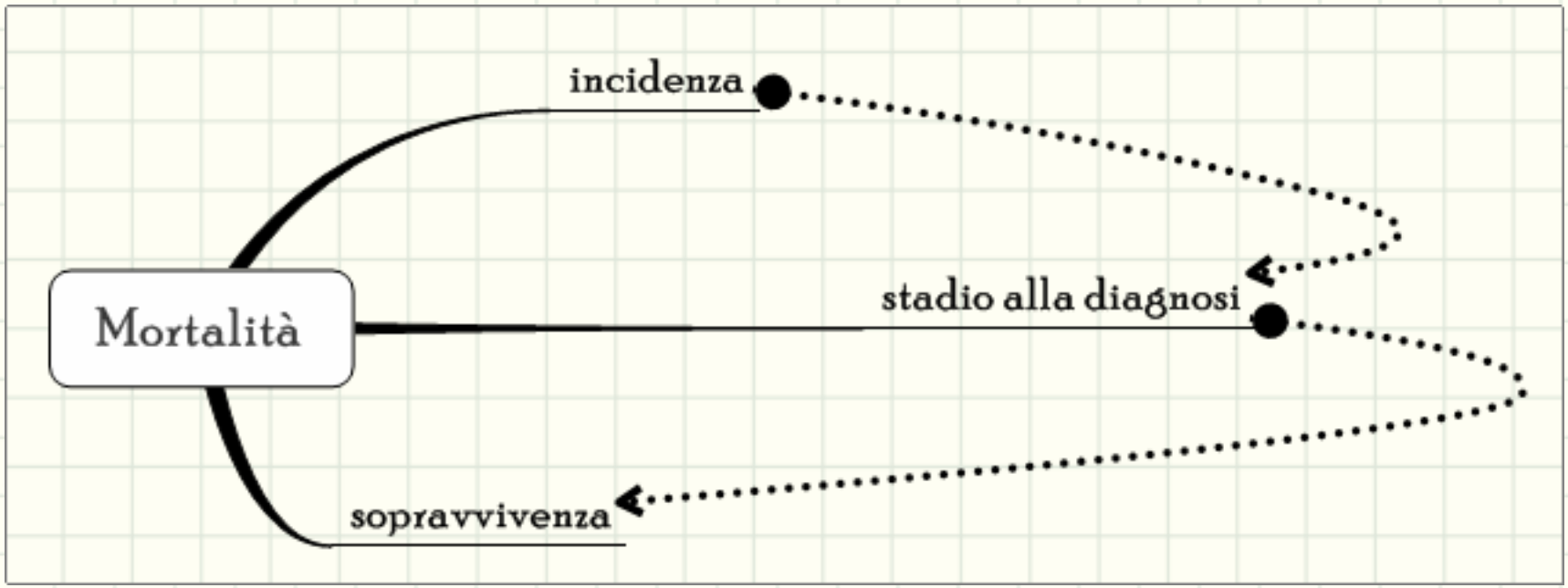
Perfezionamento dei dati con informazioni fornite dagli specialisti

↓

*Perfezionamento dei dati con informazioni da centri extraregionali**



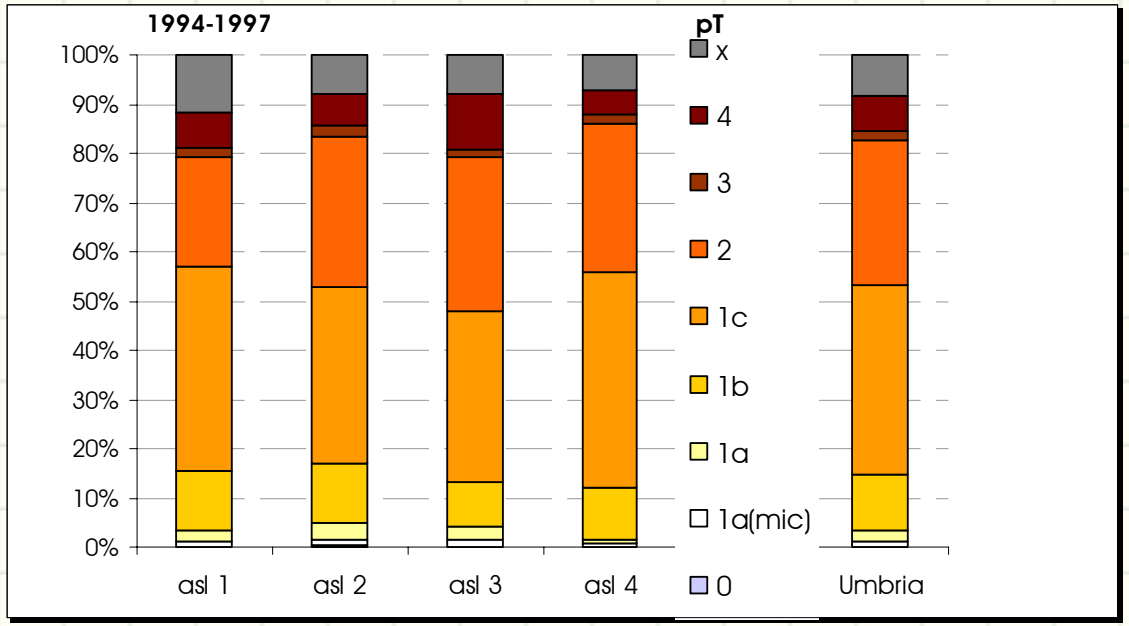
**** In corso***

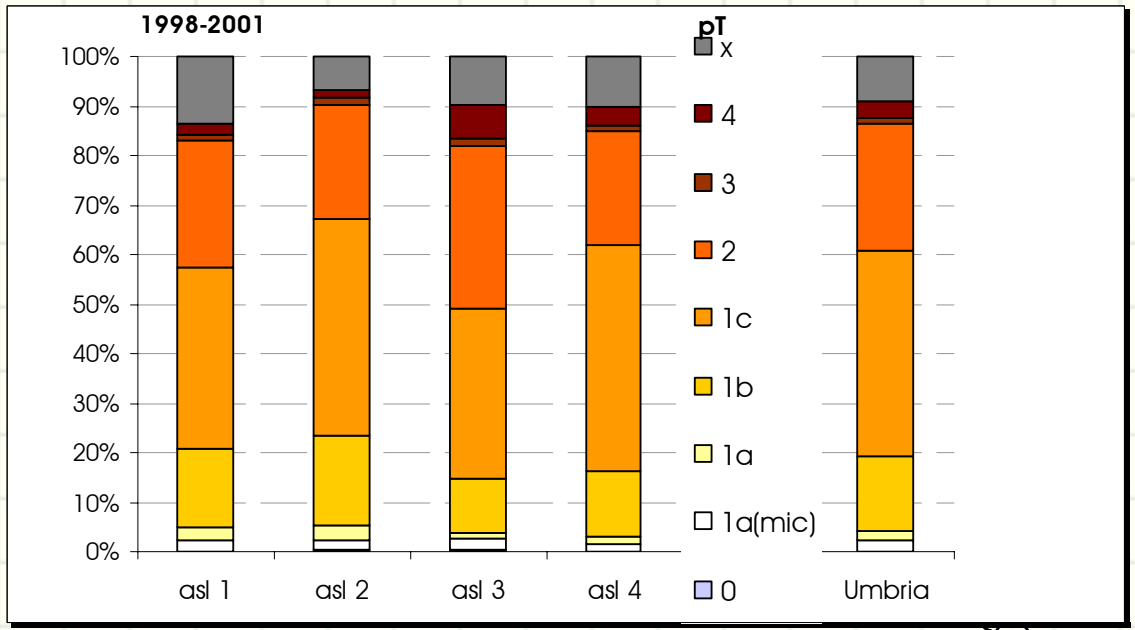

incidenza
Mortalità
stadio alla diagnosi
sopravvivenza

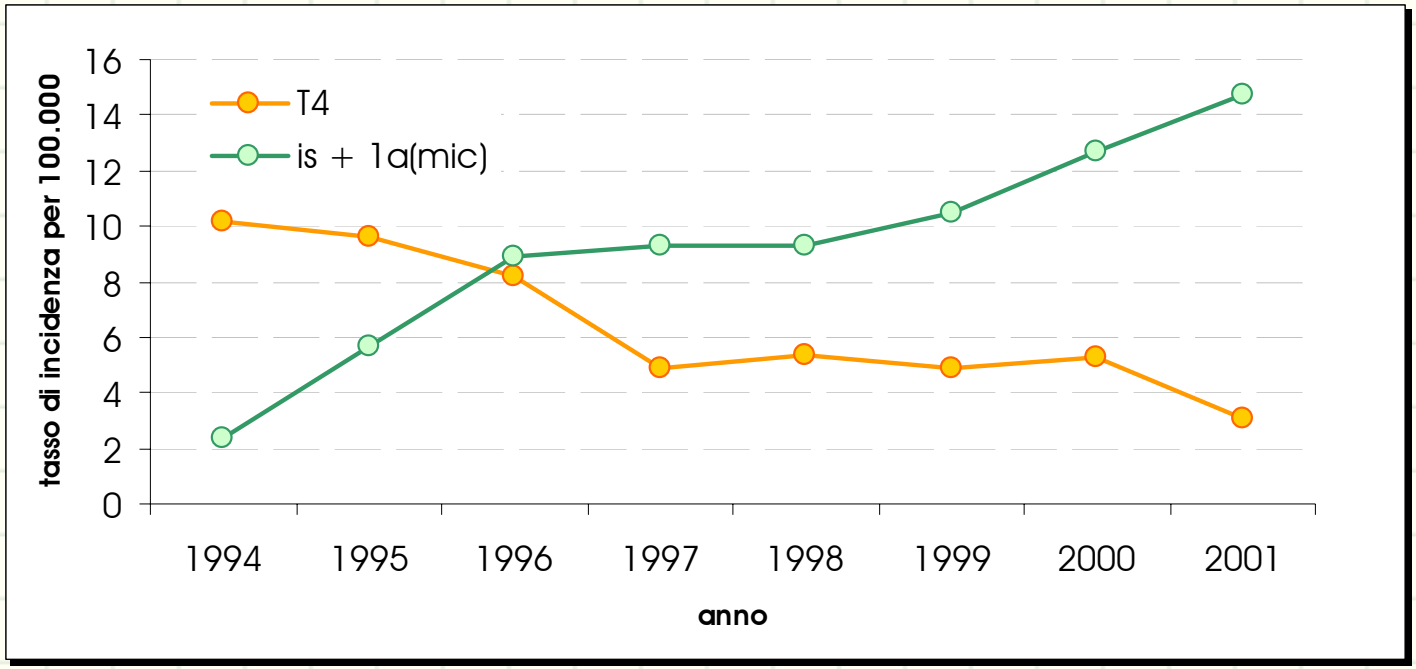
Distribuzione dei casi per stadio pT, periodo e asl

Un miglioramento tra i due periodi appare più evidente per la asl 2

La asl 3 ha una distribuzione sfavorevole dei casi in termini di stadio più avanzato





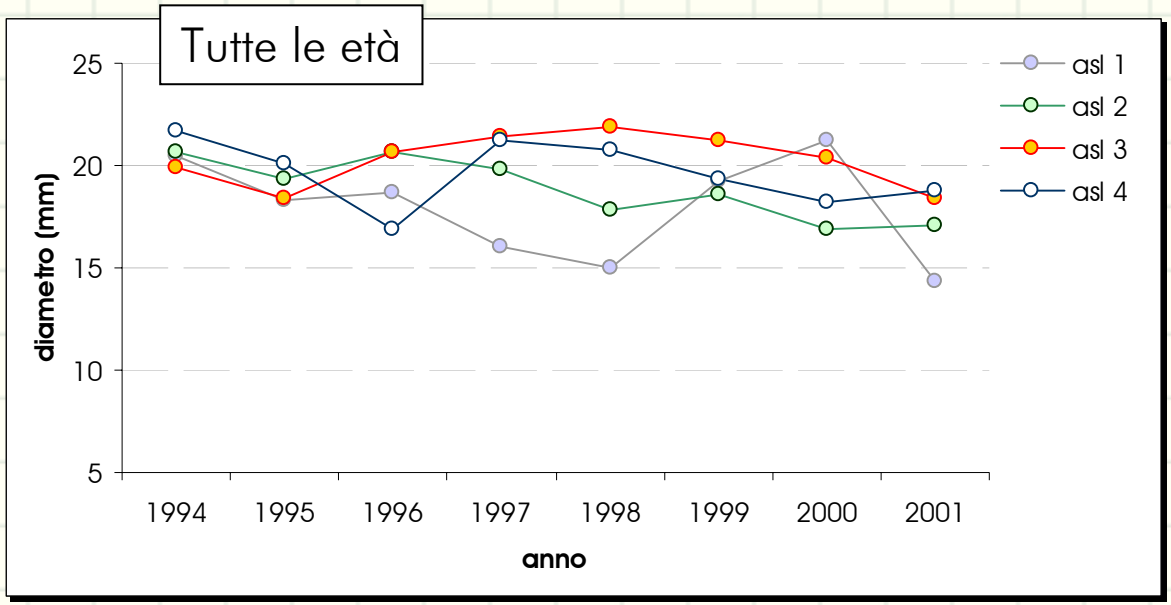


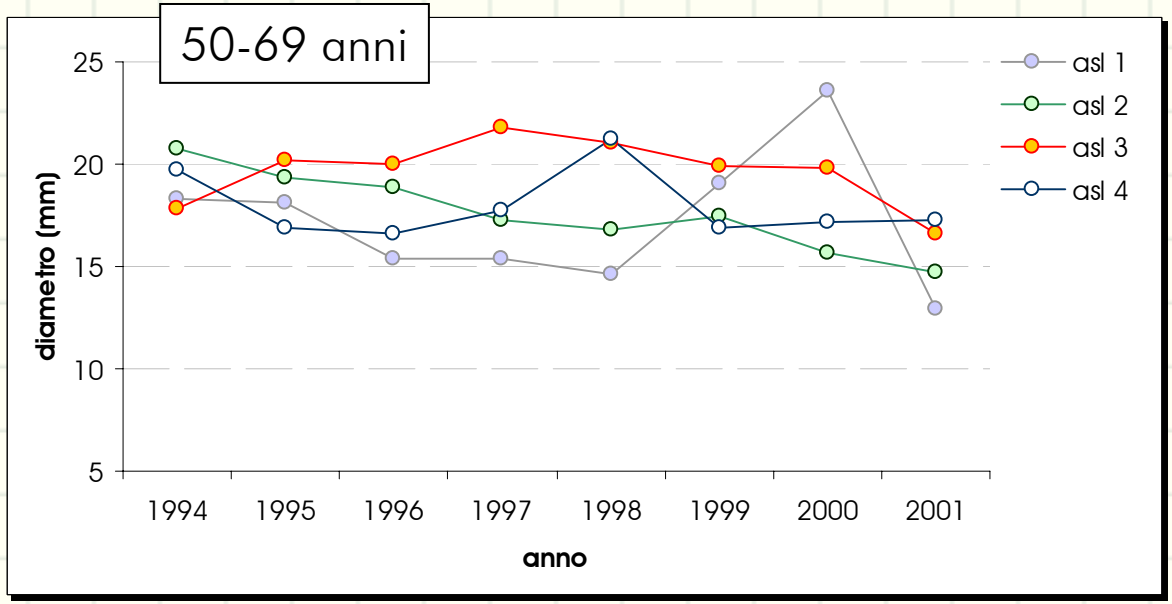
Tasso grezzo di incidenza di casi in stadio molto precoce (in situ e microinvasivi) e di casi in stadio localmente avanzato (T4).

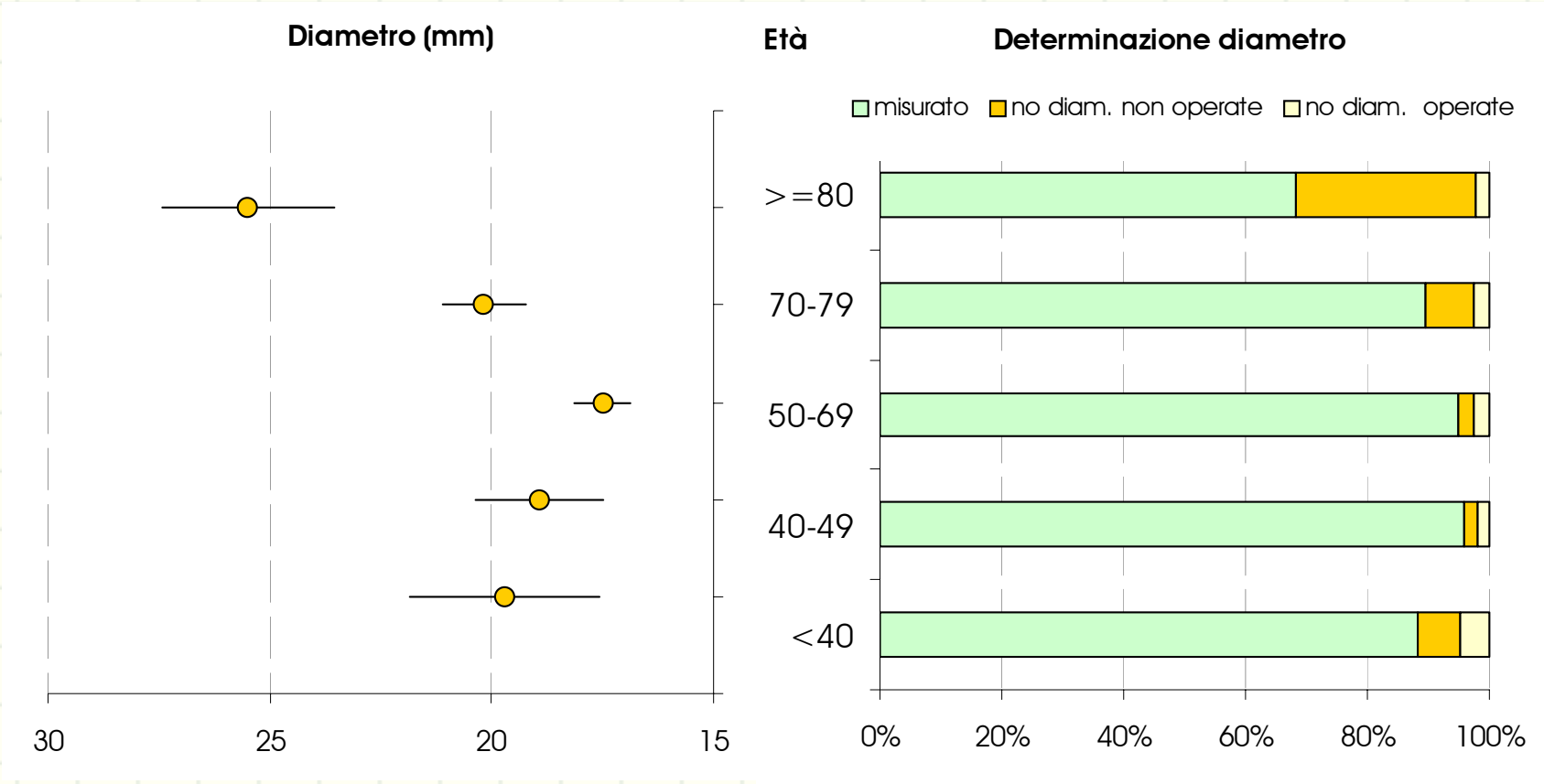
Regressione lineare per il diametro alla diagnosi (periodo 1997-2001).

			95% CI	
	coeff.	p	LI	LS
anno	-.5	0.002	-.85	-.19
asl	*(rif. asl 2)*			
asl 1	.03	0.97	-1.6	1.7
asl 3	**2.3**	0.000	1.1	3.5
asl 4	**1.4**	0.03	.1	2.6
classe d'età	*(rif 40-49)*			
<40	.7	0.58	-1.9	3.3
50-59	**-1.9**	0.03	-3.6	-.18
60-69	-1.2	0.15	-2.9	.45
70-79	1.0	0.24	-.68	2.8
>=80	**6.3**	0.000	3.9	8.7

Andamento del diametro alla diagnosi per asl

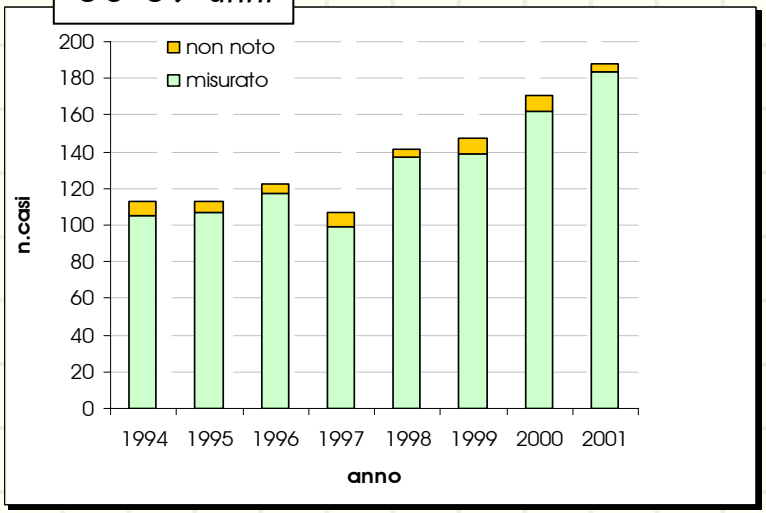




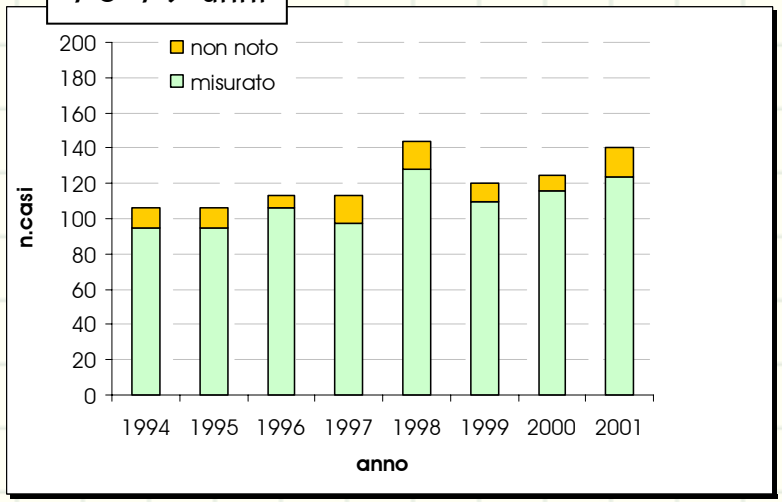


Diametro alla diagnosi (a sinistra) e quota di casi privi di informazioni sul diametro (a destra) per classe d'età

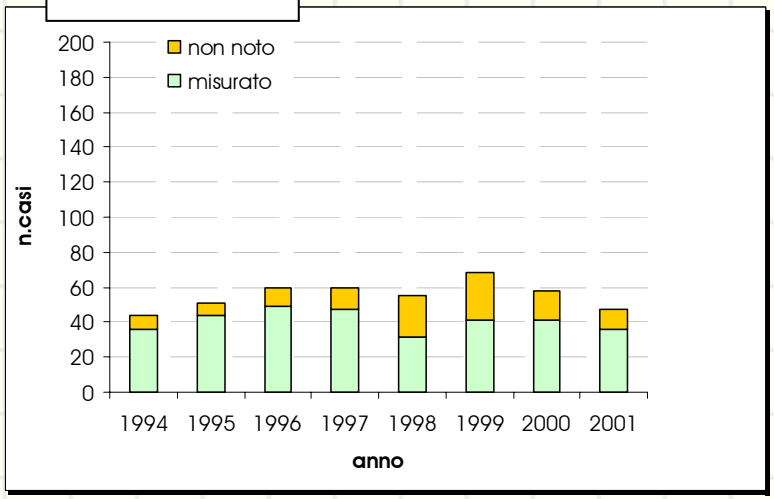
60-69 anni

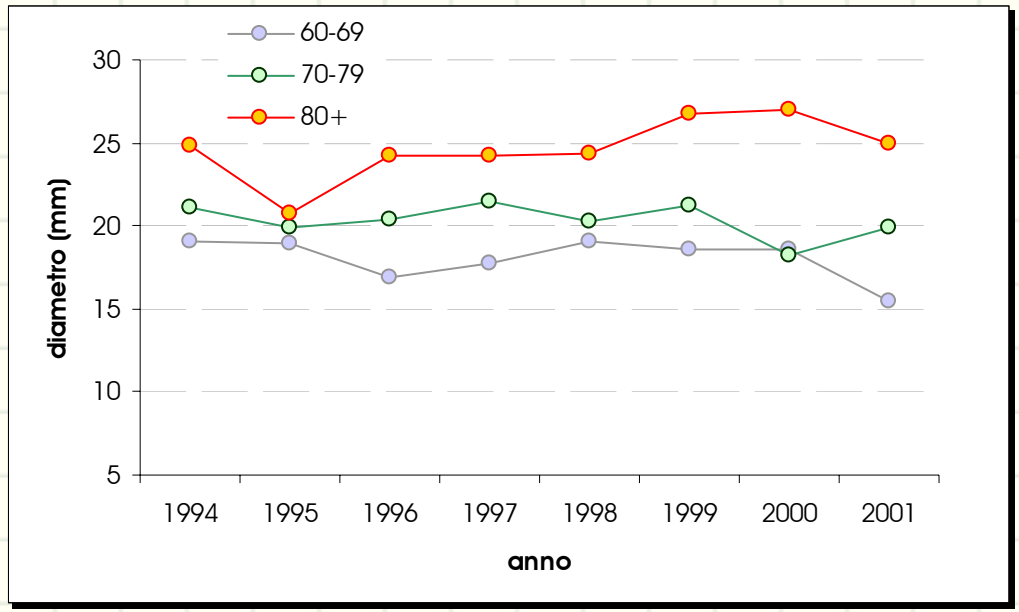


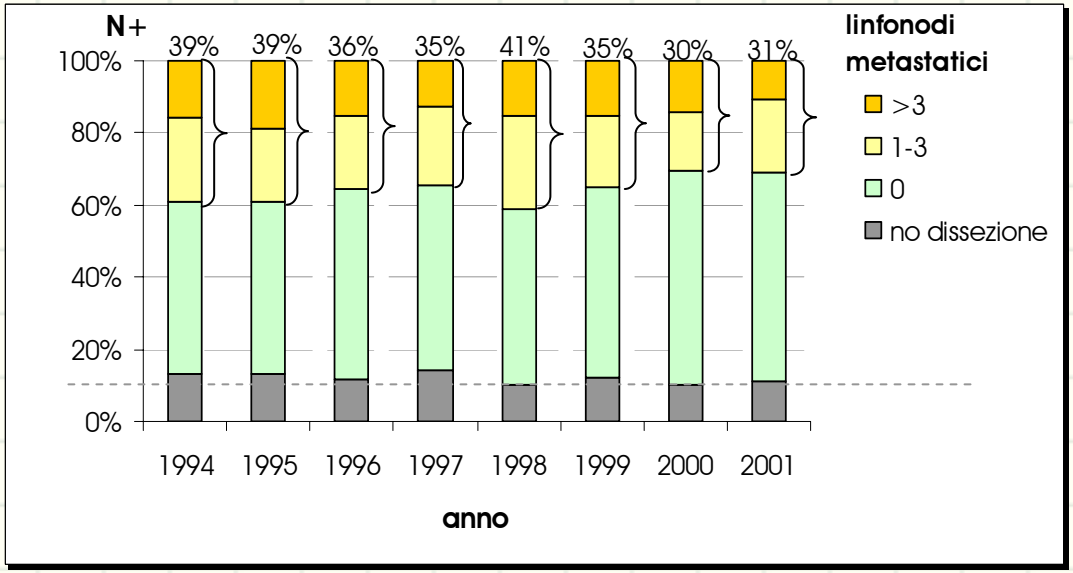
70-79 anni



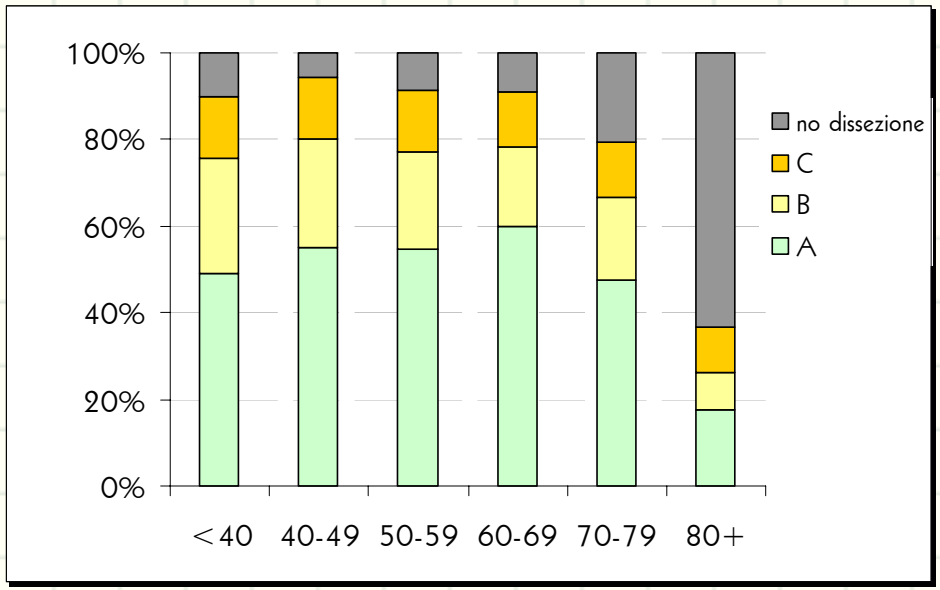
>=80 anni



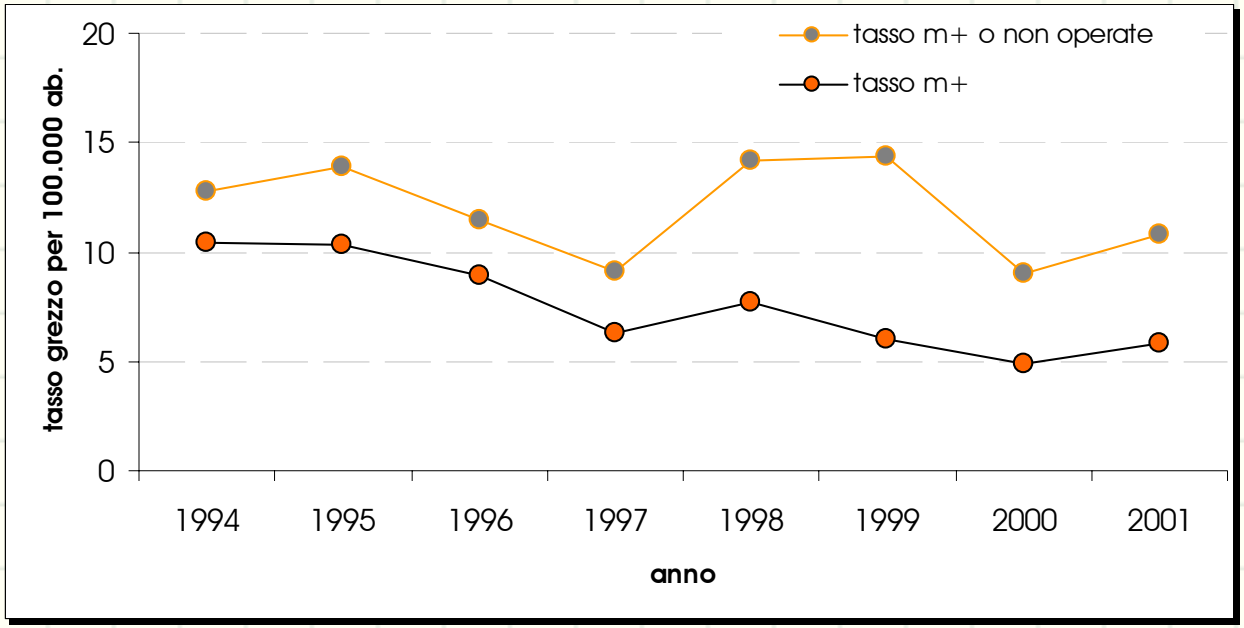




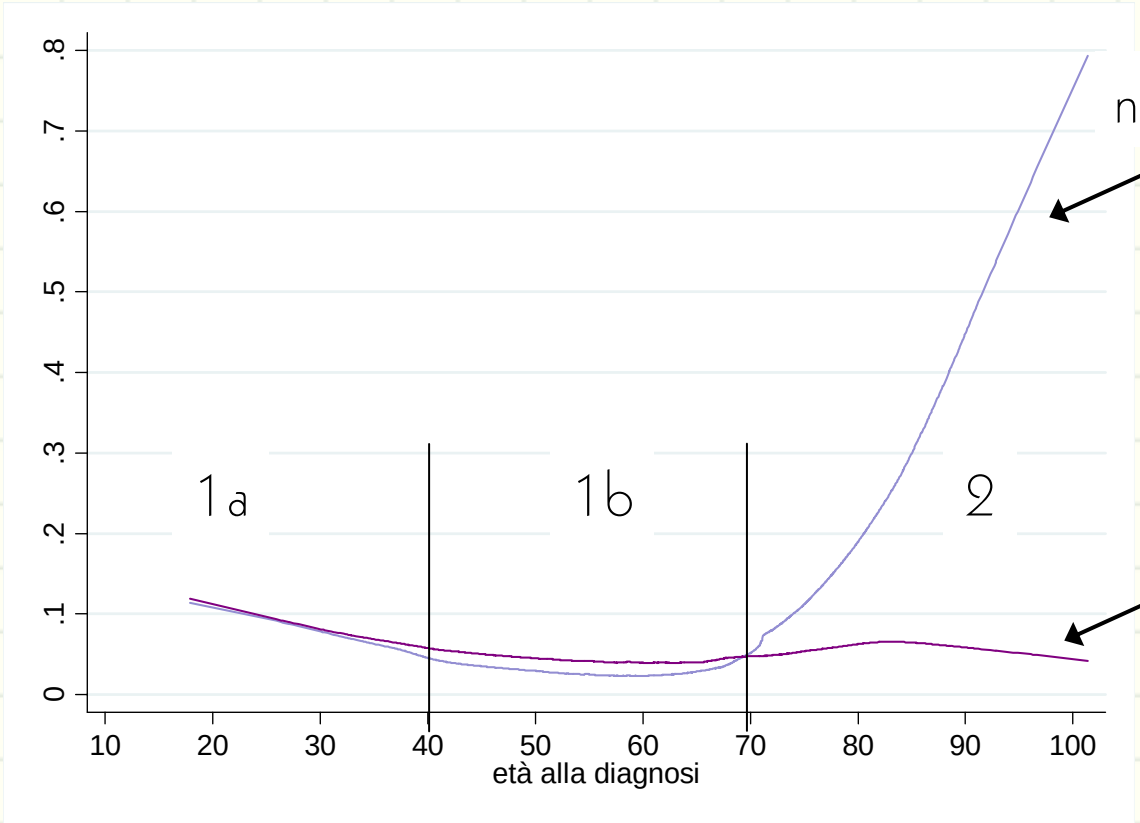
Stato dei linfonodi ascellari per anno (classificazione secondo il modello di Nottingham). Età<80 anni



Stato dei linfonodi ascellari per classe d'età



Tasso di incidenza grezzo di tumori metastatici e di tumori metastatici e/o non operati



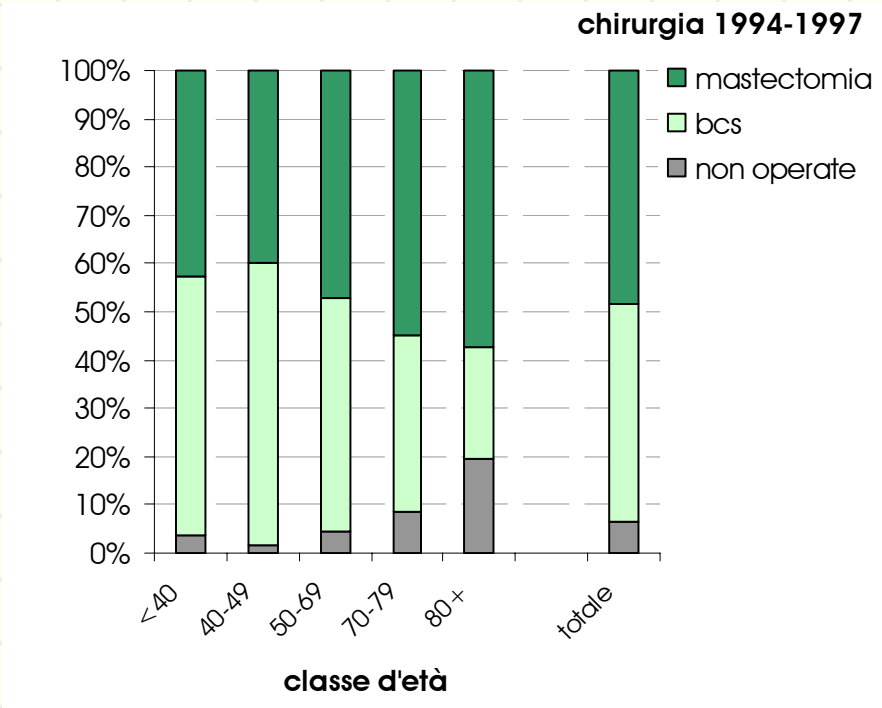
Relazione tra età e probabilità di avere metastasi a distanza alla diagnosi e di non ricevere trattamento chirurgico.

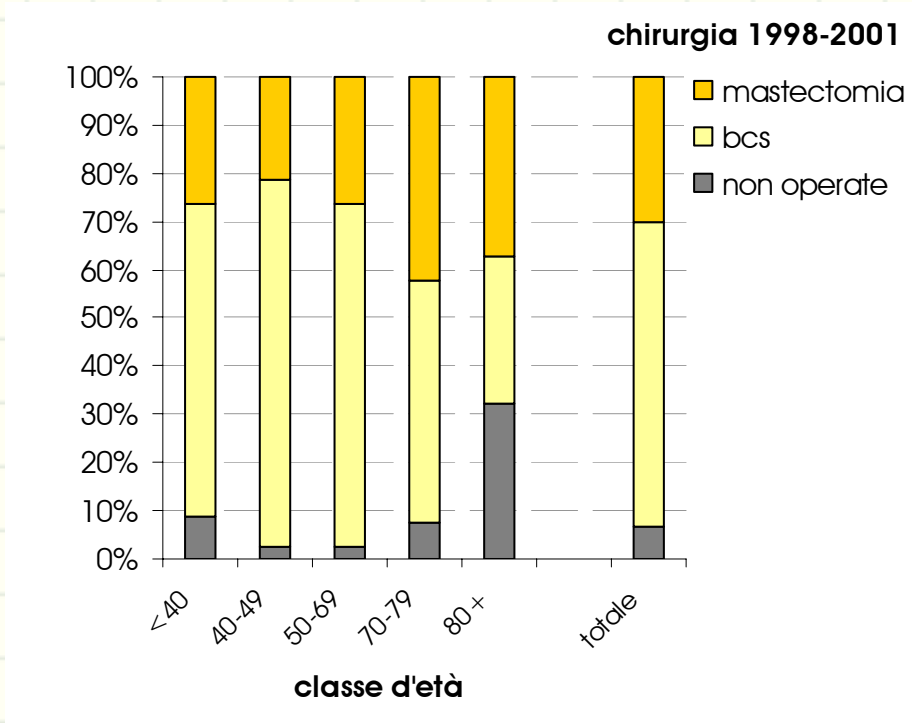
1. Relazione stretta

1a. <40 anni: coincidenza

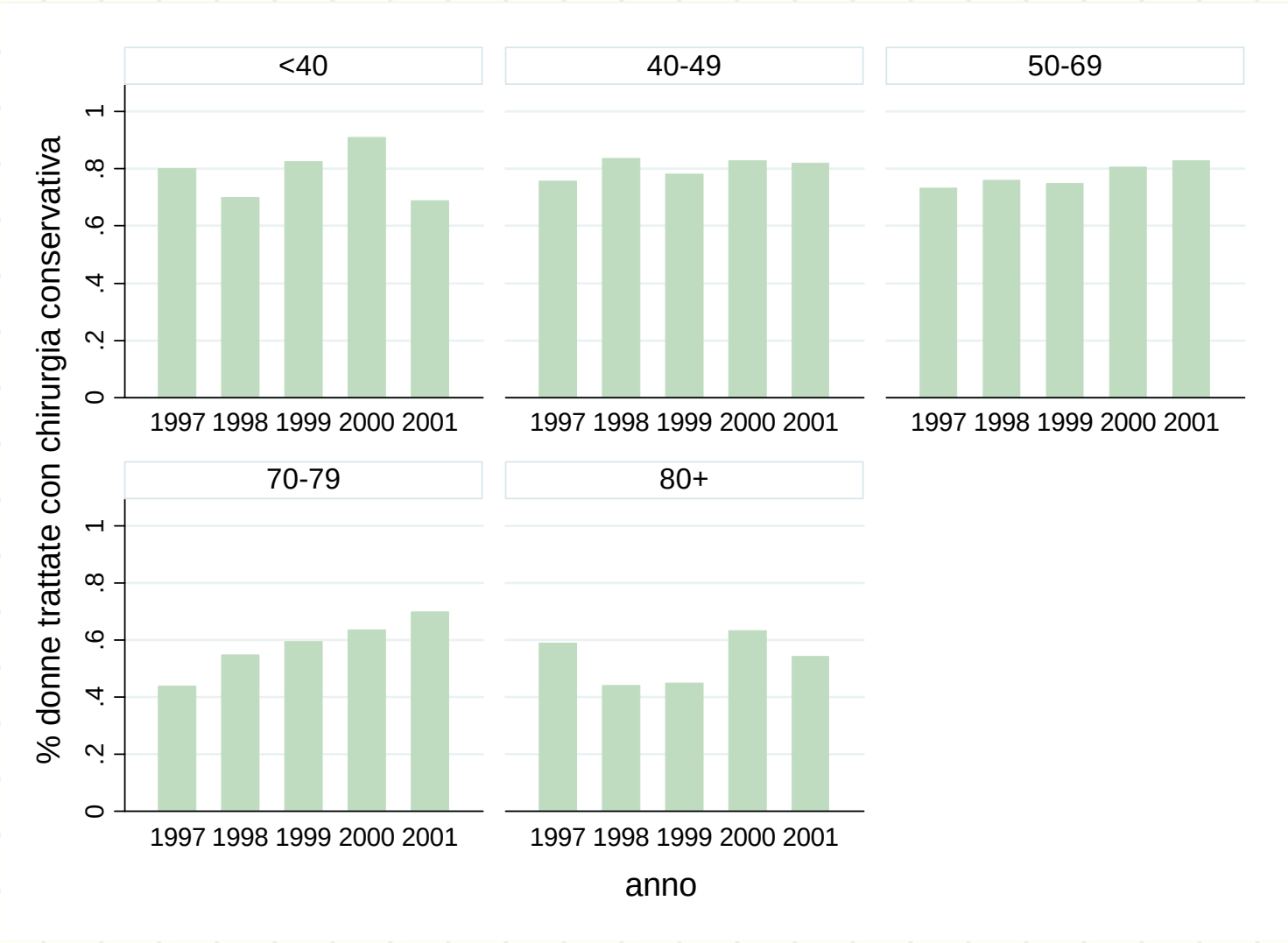
1b. 40-69 anni: p(M+)>p(no intervento)

2. Quasi indipendenza: >=70 anni: p(no intervento)>> p(M+)



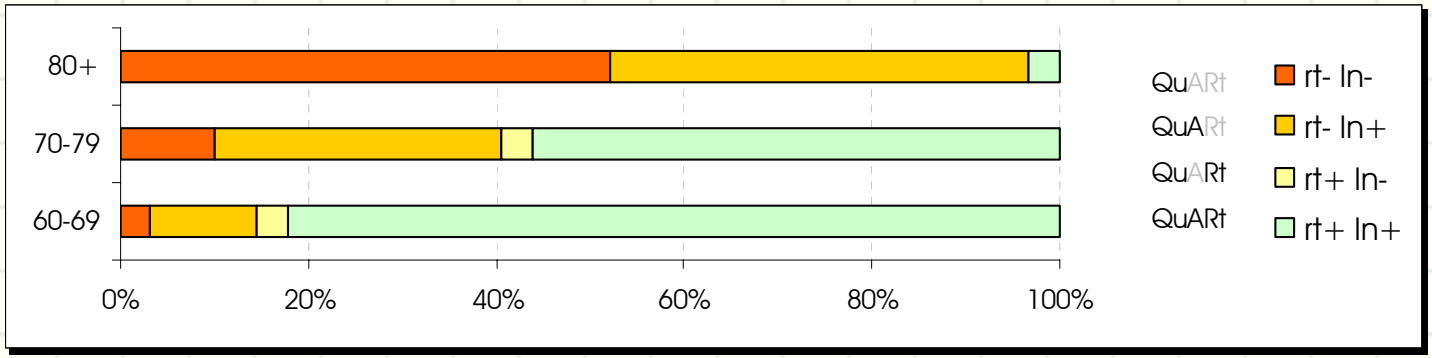


Adozione di diverse opzioni chirurgiche per classe d'età e periodo.

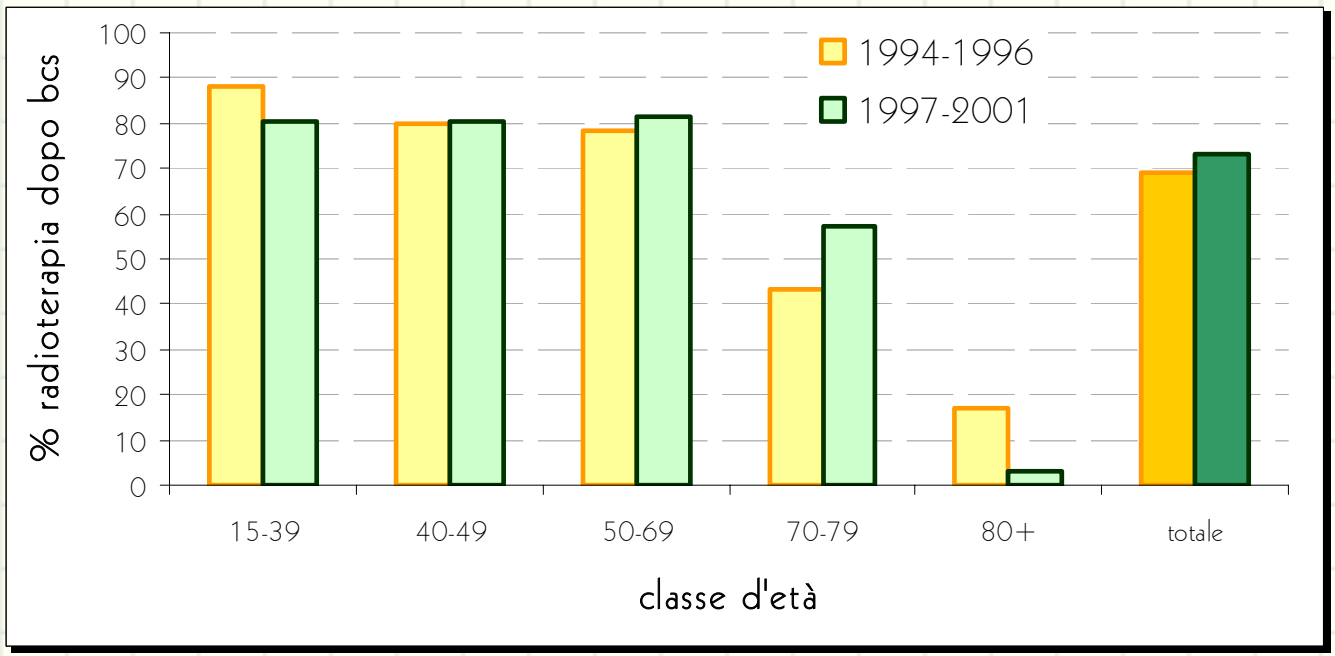


Chirurgia conservativa per anno e classe d'età.

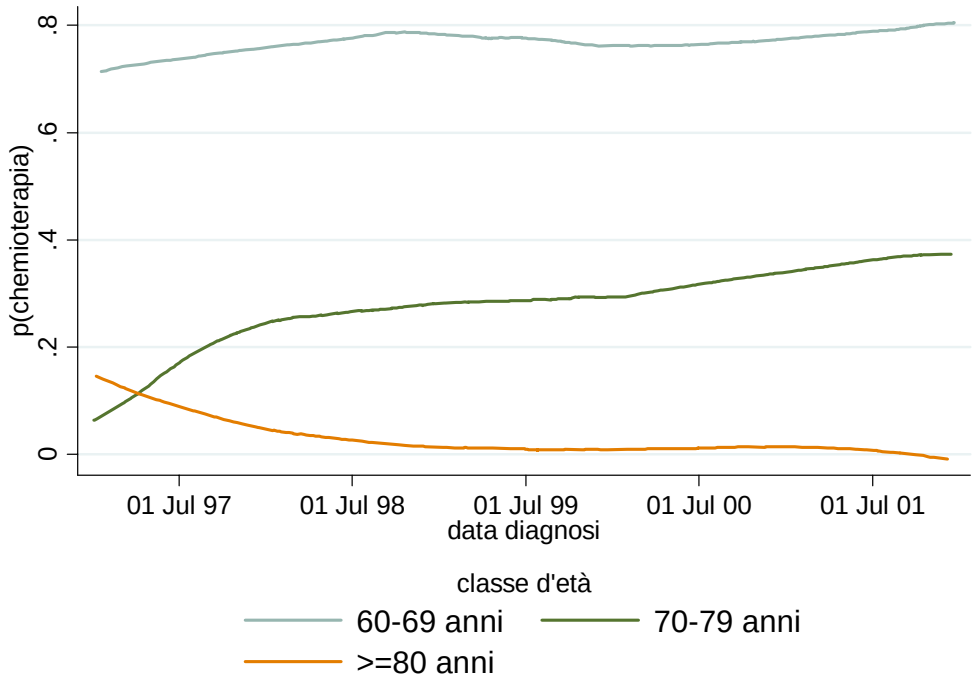
Anziane, bcs e radioterapia



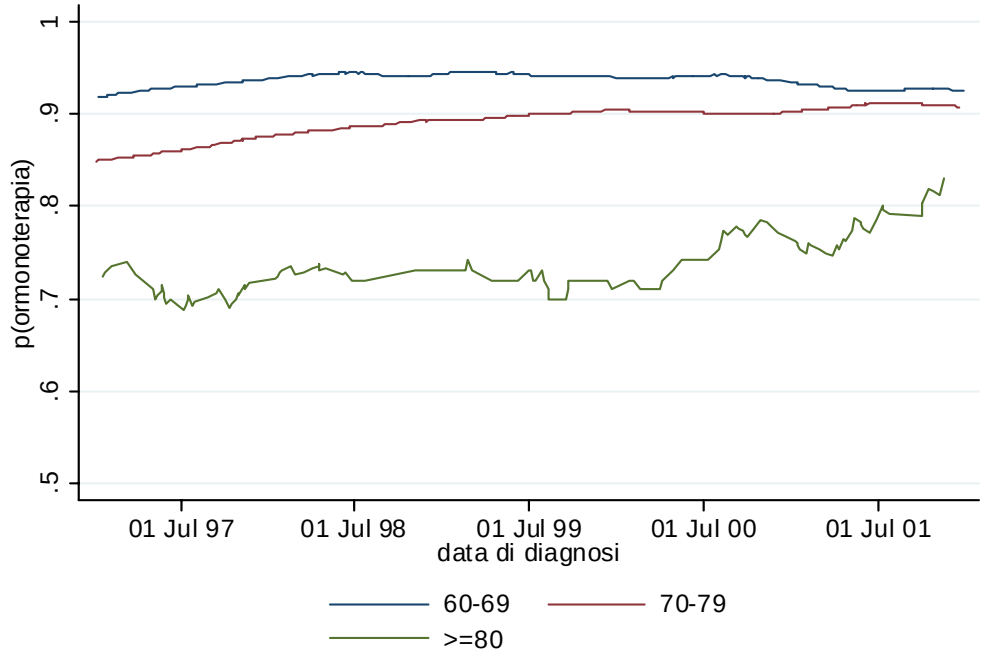
Completezza dell'intervento QuARt



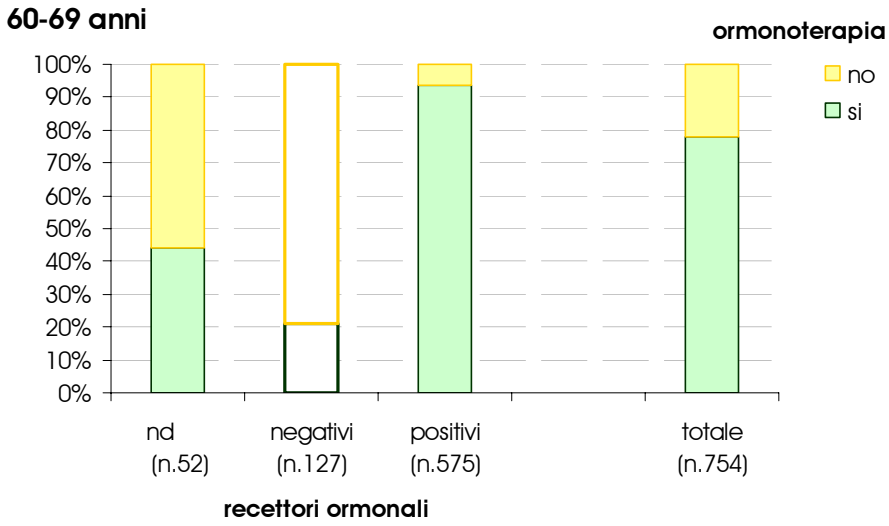
Radioterapia dopo bcs per classe d'età e periodo

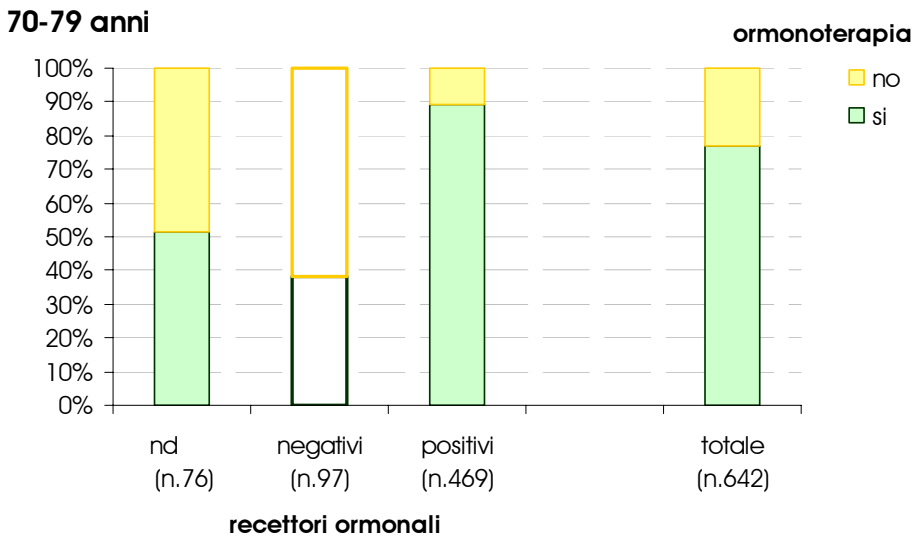


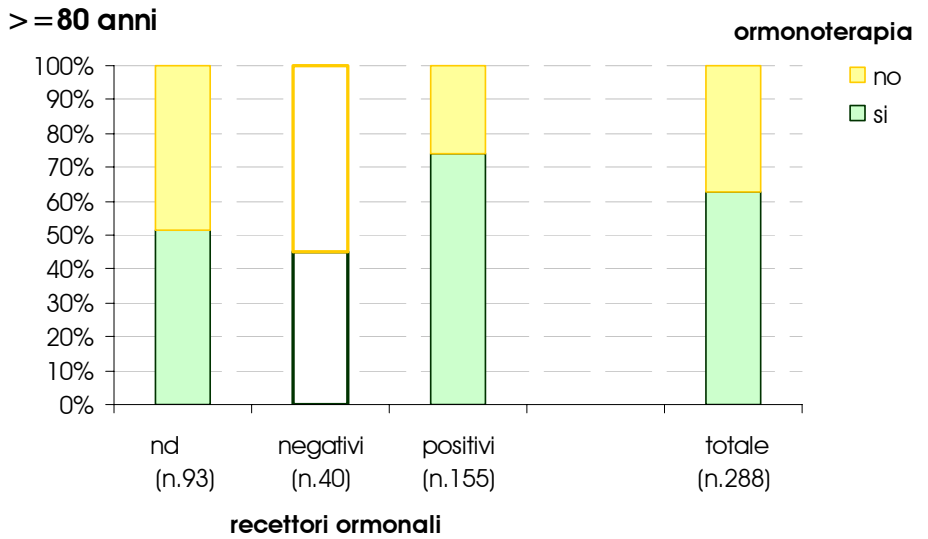
Somministrazione di chemioterapia adiuvante in donne anziane con malattia in stadio II-III in base alla data di diagnosi



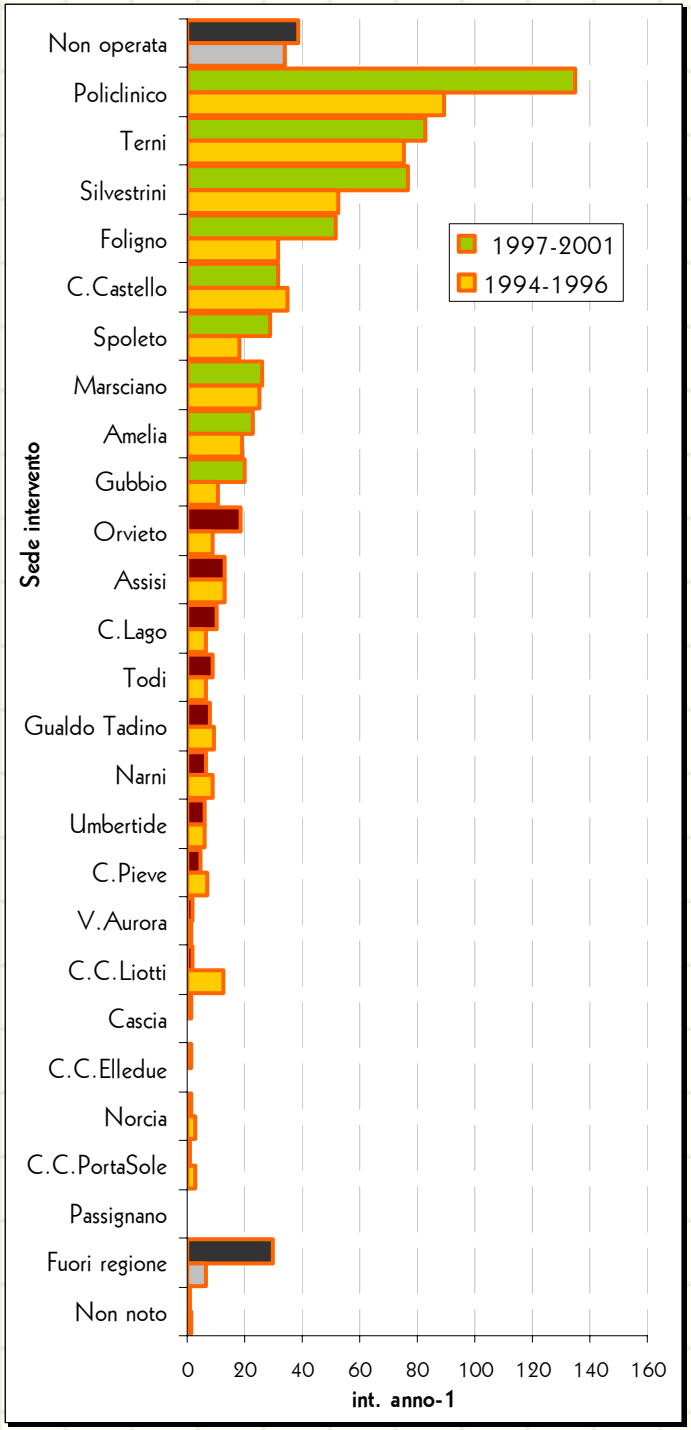
Somministrazione di ormonoterapia in donne anziane con recettori ormonali positivi in base alla data di diagnosi







Trattamento ormonale nell'anziana in base allo stato dei recettori ormonali

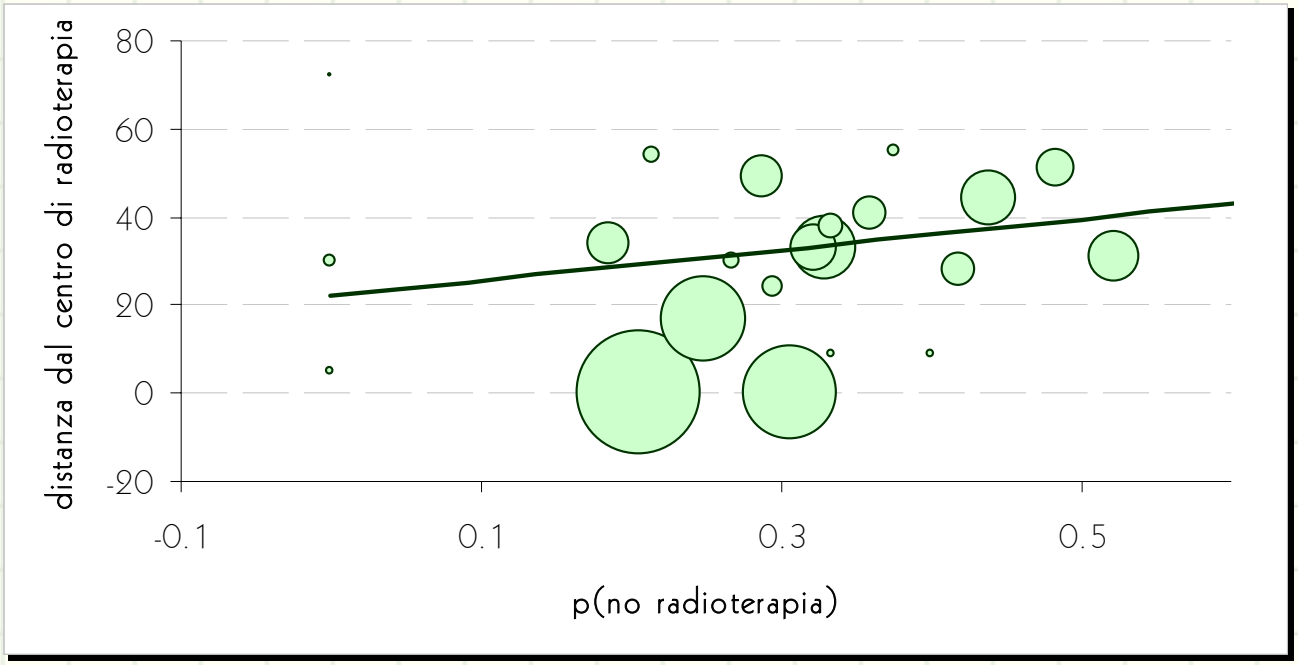


n. di nuovi interventi per stabilimento e periodo per tumori maligni primitivi della mammella in residenti umbre

i. Numerosi centri effettuano pochi interventi ogni anno

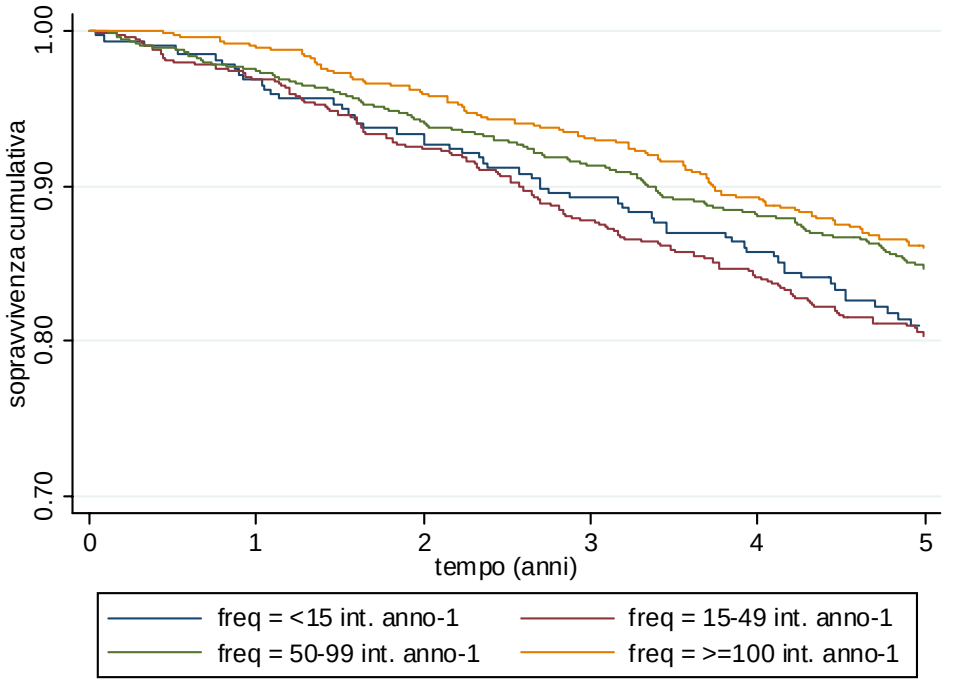
ii. Vi è un aumento dei casi non operati

iii. Aumenta l'emigrazione fuori regione

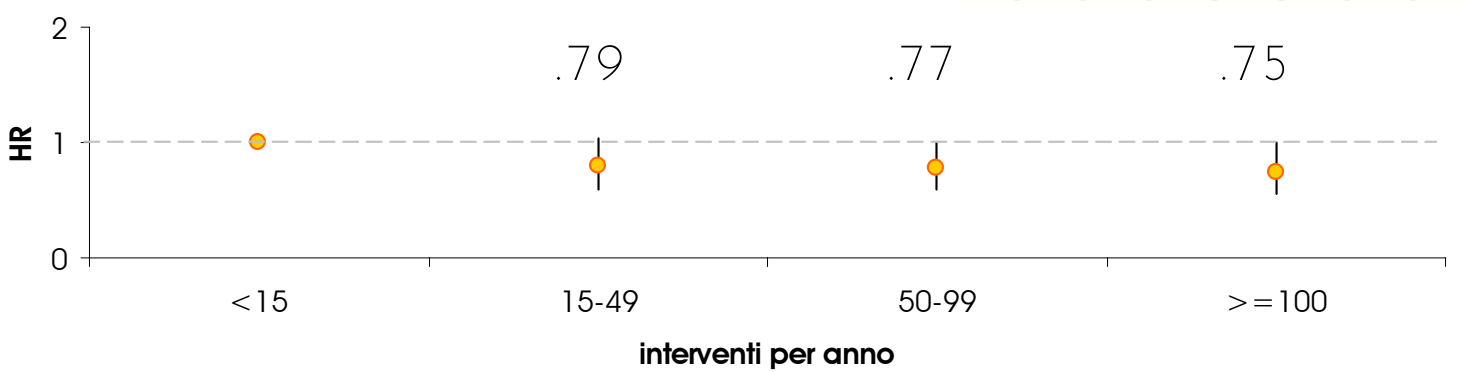


Relazione tra radioterapia e distanza dal centro di trattamento in donne trattate con bcs:

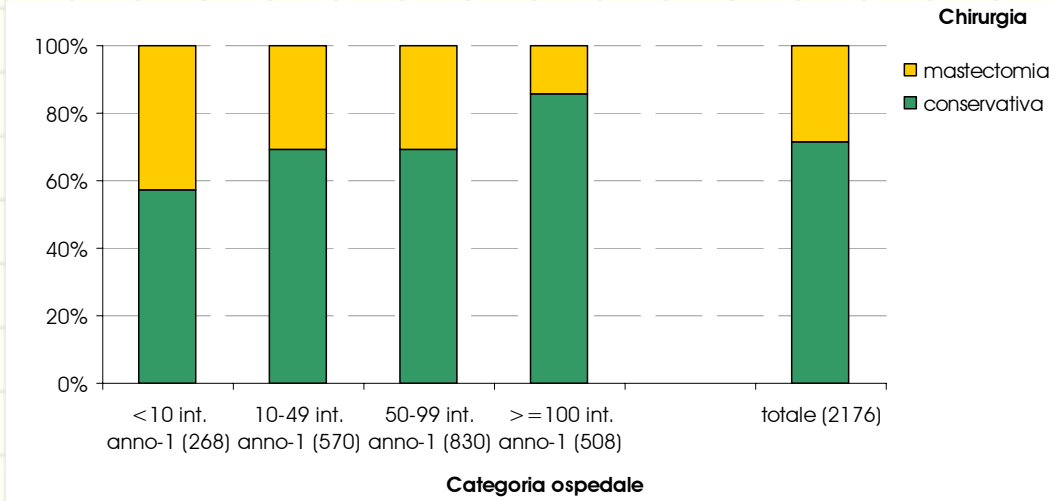
OR(30 min) = 1.7 (95% IC da 1.4 a 2.2)
OR(centro radioterapia interno)= 0.67 (95% IC da 0.48 a 0.94)
(corretto per Età e Volume)



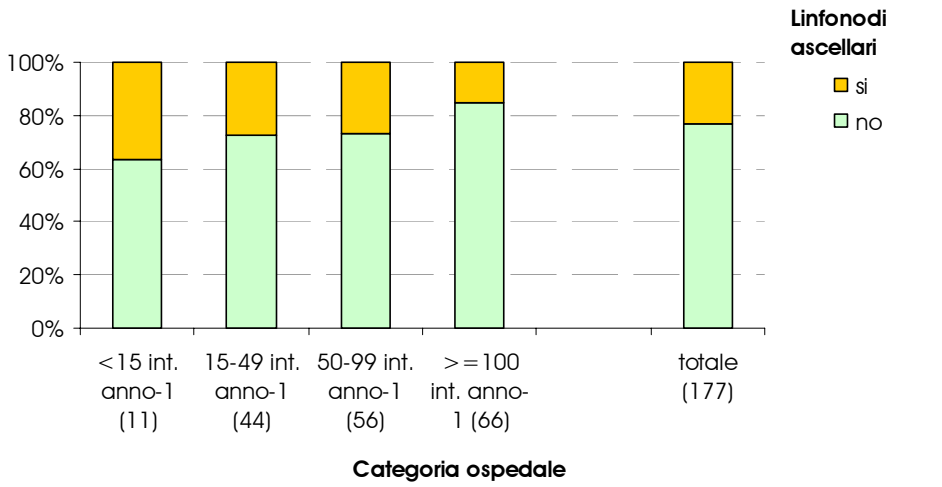
Curve di KM per volume di interventi effettuati



Modello a rischi proporzionali per volume ospedale di trattamento chirurgico (corretto per età, diametro, stato dei linfonodi e presenza di metastasi)

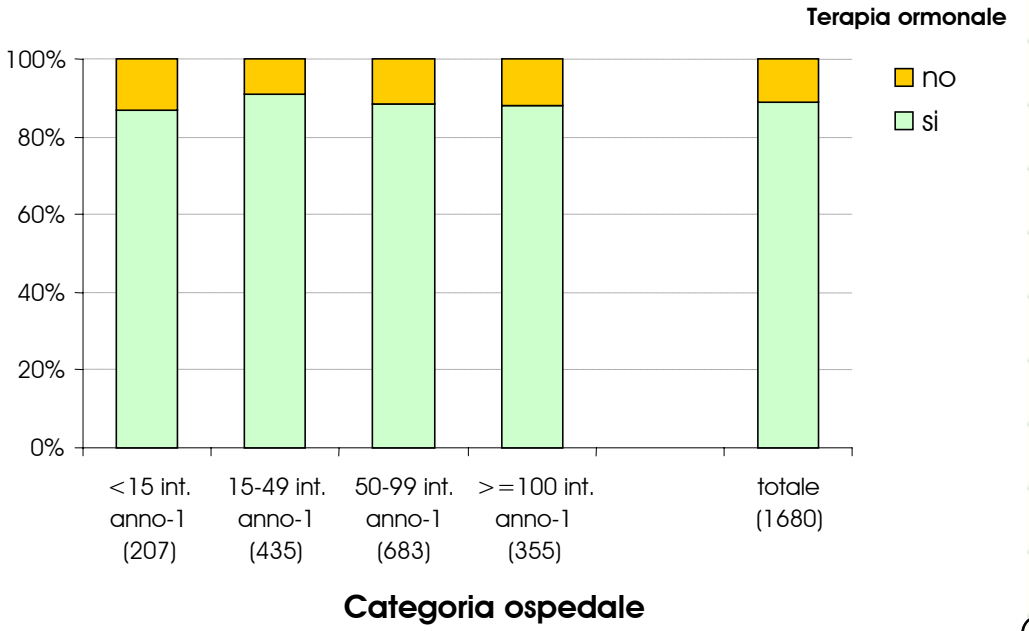


Proporzione di casi <30 mm di diametro che hanno ricevuto un intervento di chirurgia conservativa per categoria ospedaliera (p<.000)



Dissezione ascellare per carcinomi in situ (p<.000)

Malin JL, Schneider EC, Epstein AM, Adams J, Emanuel EJ, Kahn KL. Results of the National Initiative for Cancer Care Quality: how can we improve the quality of cancer care in the United States? J Clin Oncol. 2006 ;24:626-34. Epub 2006 Jan 9. Erratum in: J Clin Oncol. 2006 Apr 20;24(12):1966.

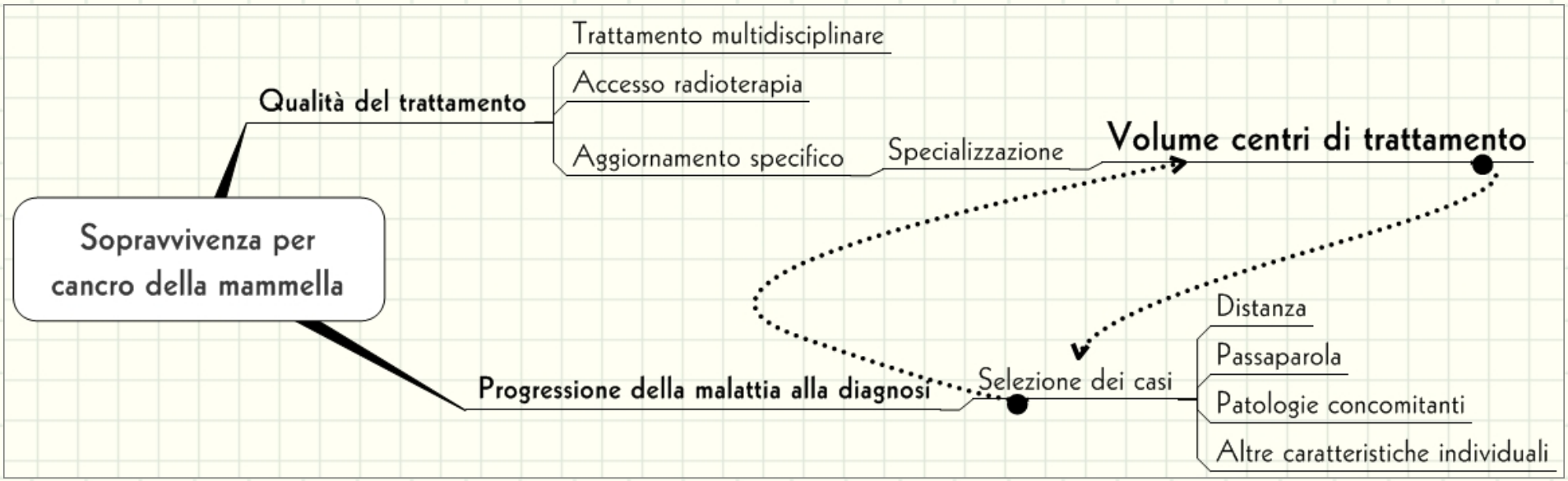


Trattamento ormonale in casi con stadio I-III, con diametro >=10 mm o linfonodi positivi e almeno un tipo di recettore positivo. p .4

Chemioterapia adiuvante in casi stadio II-III età<50 anni, con tumori >20mm o diffusione ai linfonodi ascellari (p.8)

		Chemioterapia	
Categoria ospedale	n.	si	no
<10 int. anno^{-1}	21	95.2	**4.8**
10-49 int.anno^{-1}	60	95.0	**5.0**
50-99 int. anno^{-1}	111	95.5	**4.5**
>=100 int. anno^{-1}	79	97.5	**2.5**
totale	271	95.9	4.1

6 dicembre 2006


Sopravvivenza per cancro della mammella
Qualità del trattamento
Trattamento multidisciplinare
Accesso radioterapia
Aggiornamento specifico
Specializzazione
Volume centri di trattamento
Progressione della malattia alla diagnosi
Selezione dei casi
Distanza
Passaparola
Patologie concomitanti
Altre caratteristiche individuali

Cosa abbiamo osservato:

- Nel complesso una tendenza al miglioramento degli indicatori mortalità e sopravvivenza
- Un andamento divergente degli indicatori per classe d'età in parte previsto ed in relazione allo screening e in parte imprevisto
    1. Nelle donne più giovani e più anziane un peggioramento del controllo …
    2. Nelle classi d'età 50-69 anni un miglioramento che si è tradotto in una riduzione significativa della mortalità nella classe 60-69 anni
    3. Disomogeneità per asl e tra gli anni di osservazione
    4. Un possibile effetto del volume sull'esito e un sicuro effetto di distanza e presenza del centro di trattamento sulla somministrazione di radioterapia

Evidenza scientifica

Formulazione di linee guida

Individuazione di indicatori di appropriatezza

Individuazione di un problema

Espansione dei dati rilevati

Individuazione di determinanti modificabili di esito

Individuazione di una strategia di intervento

Selezione di indicatori specifici

Sistema di indicatori

Tipo a. Indicatori condivisi derivati dalla letteratura formulati in termini di interventi appropriati / casi in cui l'intervento sarebbe stato appropriato

- obiettivo: favorire l'adozione uniforme di pratiche efficaci

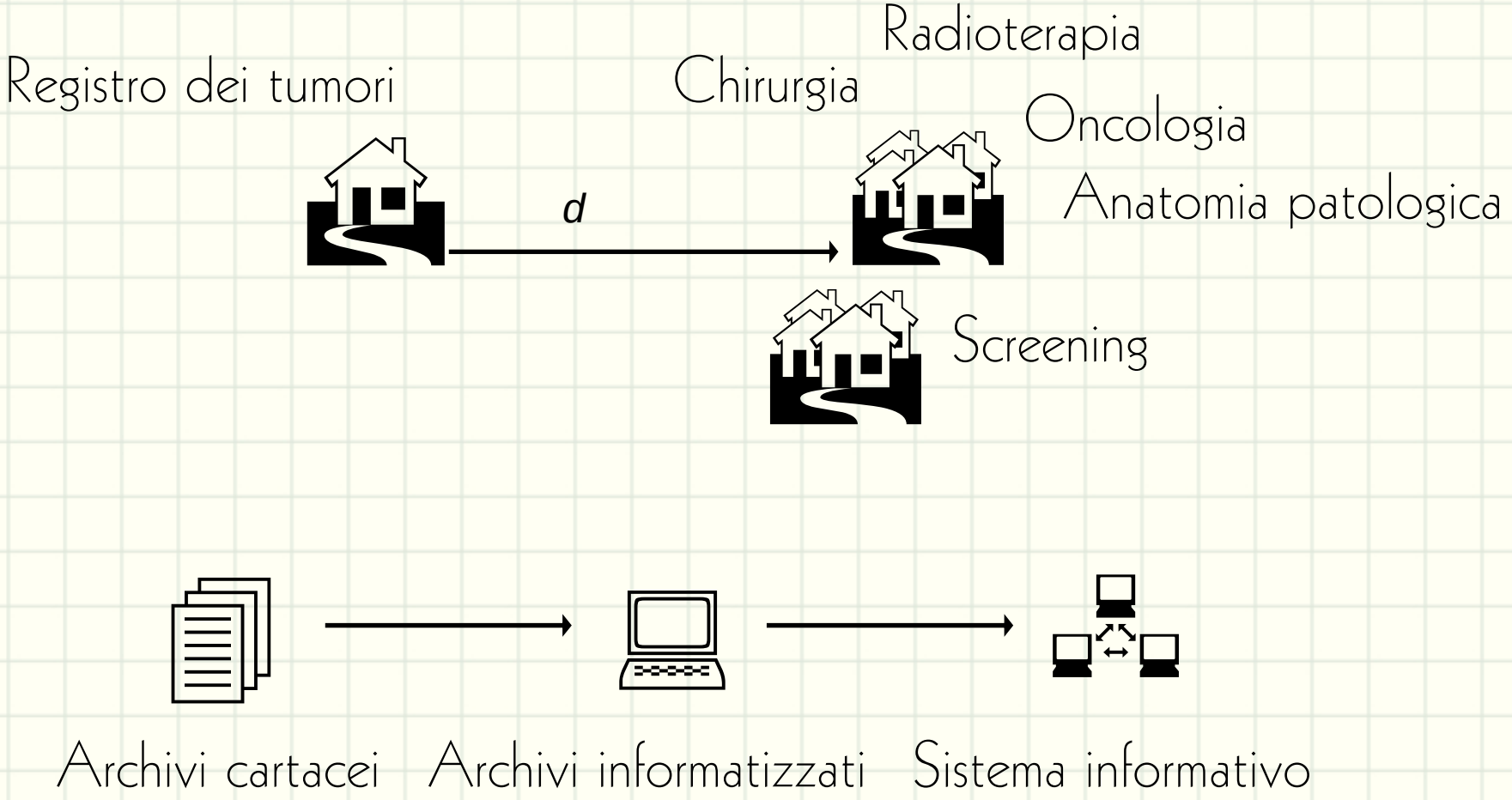
Tipo b. Indicatori condivisi di rilevanza locale tratti dall'osservazione epidemiologica e dalle esperienze delle figure coinvolte nel sistema oncologico:

b1. Indicatori locali normativi o prescrittivi

- obiettivo: ottenere un mutamento rispetto ad una precedente azione o assetto organizzativo

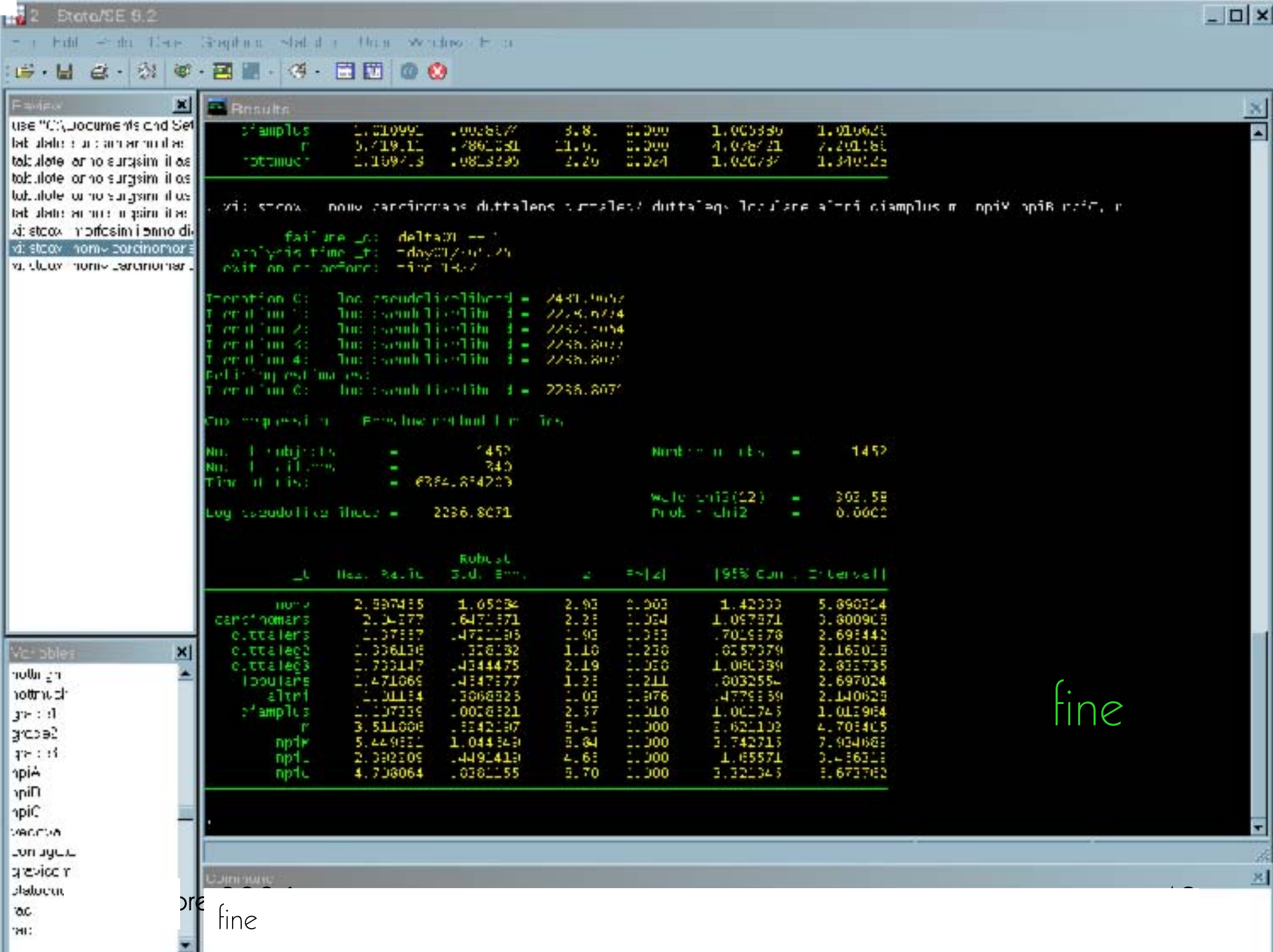
b2 Indicatori locali valutativi

- obiettivo: valutare il grado di conseguimento di obiettivi intermedi o finali


Radioterapia
Registro dei tumori
Chirurgia
Oncologia
d
Anatomia patologica
Screening
Archivi cartacei
Archivi informatizzati
Sistema informativo

Potremmo…

- fornire dati con maggiore **tempestività**, quasi in tempo reale
- **espandere il sistema** di supporto alla rete oncologica prendendo in considerazione
    a. un maggior numero di sedi
    b. nuovi domini di valutazione [disabilità e riabilitazione, tempi di diagnosi e trattamento, effetti indesiderati, controllo dei sintomi incluso il dolore, effetto di assetti organizzativi…]
- facilitare l'esecuzione di **ricerche** su trattamenti e fattori genetici/molecolari con base di popolazione


fine
fine

Prevalence estimates of diabetes, 2025

CONTROLLO DEL DIABETE TIPO 2

Fabrizio Stracci

Diabete tipo 2

- insulin resistance, in which target tissues do not use insulin properly.
- It accounts for approximately 90% to 95% of all diagnosed cases of diabetes

Diagnosi (criteri uniformi per convenzione)

- Typical symptoms of diabetes are present (for example, polyuria, polydipsia, or unexplained weight loss), a casual (that is, at any time without regard to the last meal) plasma glucose level of 11.1 mmol/L (200 mg/dL) or greater confirms the diagnosis.
- A fasting plasma glucose level of 7.0 mmol/L (126 mg/dL) or greater or an oral glucose tolerance test with a 2-hour value of 11.0 mmol/L (200 mg/dL) or greater
- Alberti KG, Zimmet PZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus provisional report of a WHO consultation. Diabet Med. 1998;15:539- 53.

Prediabetes

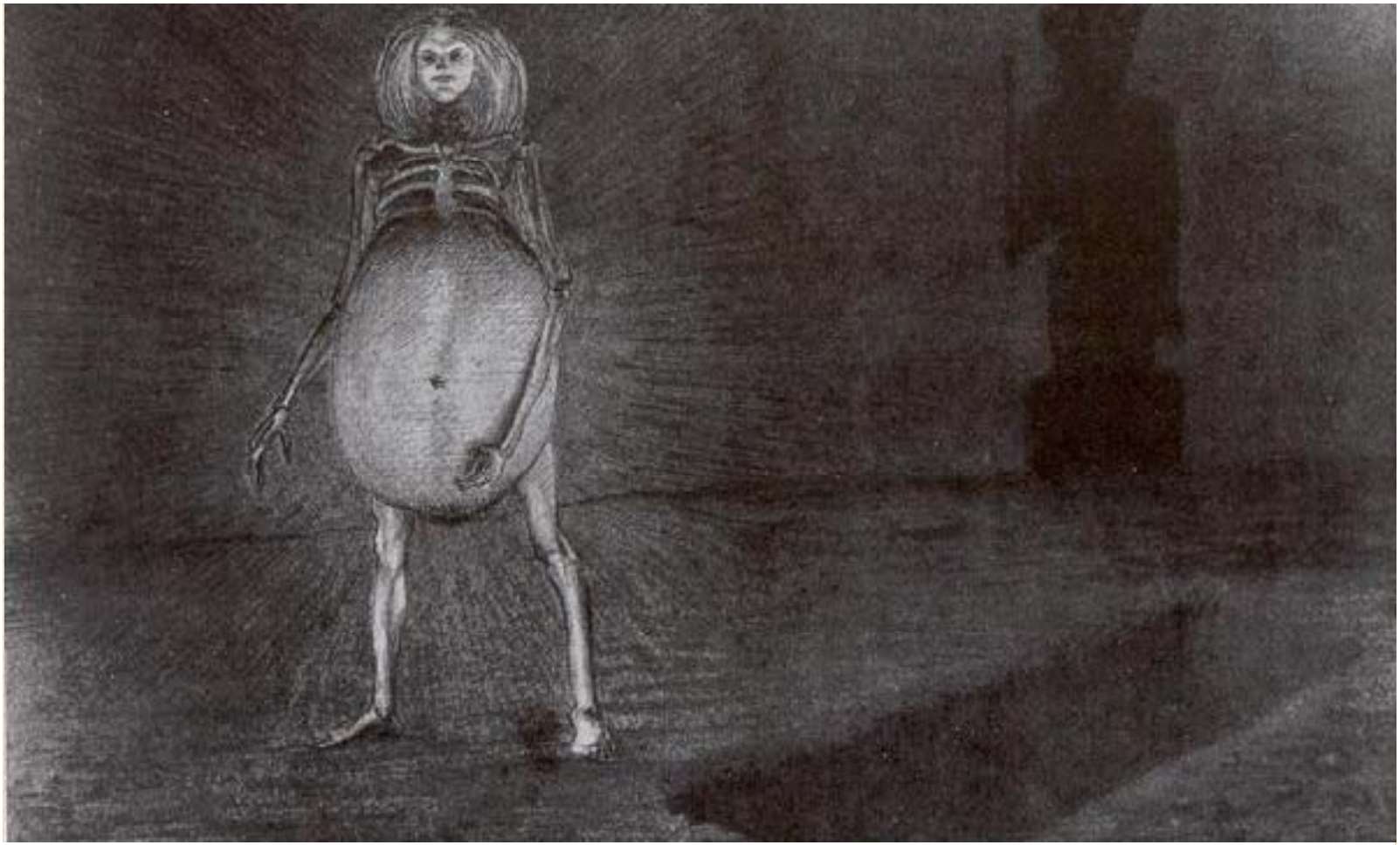
- Prediabetes is defined as impaired fasting glucose (IFG) with glucose levels of 100 to 125 mg/dL
- and/or impaired glucose tolerance (IGT) with glucose levels of 140 to 199 mg/dL 2 hours after an oral load of 75 g of dextrose.
- It is estimated that approximately 40% of people diagnosed with IGT progress on to DM over a 5- to 10-year period

Sindrome metabolica

- ***Central obesity (defined as waist circumference ≥ 94cm for Europid men and ≥ 80cm***
- for Europid women, *with ethnicity specific values for other groups)*

plus any two of the following four factors:

- ***raised TG level: ≥ 150 mg/dL (1.7 mmol/L), or specific treatment for this lipid abnormality***
- ***reduced HDL cholesterol: < 40 mg/dL (1.03 mmol/L*) in males and < 50*** mg/dL (1.29 mmol/L*) in females, ***or specific treatment for this lipid abnormality***
- ***raised blood pressure: systolic BP ≥ 130 or diastolic BP ≥ 85 mm Hg, or treatment of previously diagnosed hypertension***
- ***raised fasting plasma glucose (FPG) ≥ 100 mg/dL (5.6 mmol/L), or previously diagnosed type 2 diabetes.*** *If above 5.6 mmol/L or 100 mg/dL, OGTT is strongly recommended but is not necessary to define presence of the syndrome.*
- **IDF consensus worldwide definition of the metabolic syndrome**



Fattori di rischio

Risk factors

Table 1. Risk factors for type 2 diabetes
Modifiable risk factors
Lifestyle: physical inactivity, high-caloric, high-fat intake, cigarette smoking, urbanization
Overweight: BMI ≥ 25 kg/m^2
Impaired fasting plasma glucose: ≥ 100 to ≤ 125 mg/dL
Impaired glucose tolerance 2-hour plasma glucose: ≥ 140–199 mg/dL
Dyslipidemia: low HDL cholesterol, high triglycerides
Hypertension
Nonmodifiable risk factors
Age > 45 years
Family history of type 2 diabetes (parents or siblings)
Ethnicity (eg, Native Americans, Hispanic Americans, African Americans, Asian Americans, and Pacific Islanders)
Gestational diabetes
BMI—body mass index; HDL—high-density lipoprotein.

Diet, lifestyle, and the risk of type 2 diabetes

- Overweight or obesity was the single most important predictor of diabetes. Lack of exercise, a poor diet, current smoking, and abstinence from alcohol use were all associated with a significantly increased risk of diabetes, even after adjustment for the body-mass index.
- Diet, lifestyle, and the risk of type 2 diabetes mellitus in women. Hu FB, Manson JE, Stampfer MJ, Colditz G, Liu S, Solomon CG, Willett WC. N Engl J Med. 2001;345:790-7.

Risk factors

- Patients with hypertension are 2.5 times more likely to have diabetes than normotensive individuals
- Hypertension and dyslipidemia are associated with DM in the context of the metabolic syndrome, which also includes central obesity, and dysglycemia/hyperinsulinemia
- The majority of patients with diabetes or at highest risk for developing type 2 diabetes do not engage in regular physical activity, with a rate significantly below national norms

Risk factors for pre-diabetes and diabetes

in addition to being overweight or obese or being age >45 include the following:

- being physically inactive
- having a parent, brother, or sister with diabetes
- having a family background that is African American, Alaska Native, American Indian, Asian American, Hispanic/Latino, or Pacific Islander
- giving birth to a baby weighing more than 9 pounds or being diagnosed with gestational diabetes—diabetes first found during pregnancy
- having high blood pressure—140/90 mmHg or above—or being treated for high blood pressure
- having HDL, or "good," cholesterol below 35 mg/dL, or a triglyceride level above 250 mg/dL
- having polycystic ovary syndrome, also called PCOS
- having impaired fasting glucose (IFG) or impaired glucose tolerance (IGT) on previous testing…

Miti

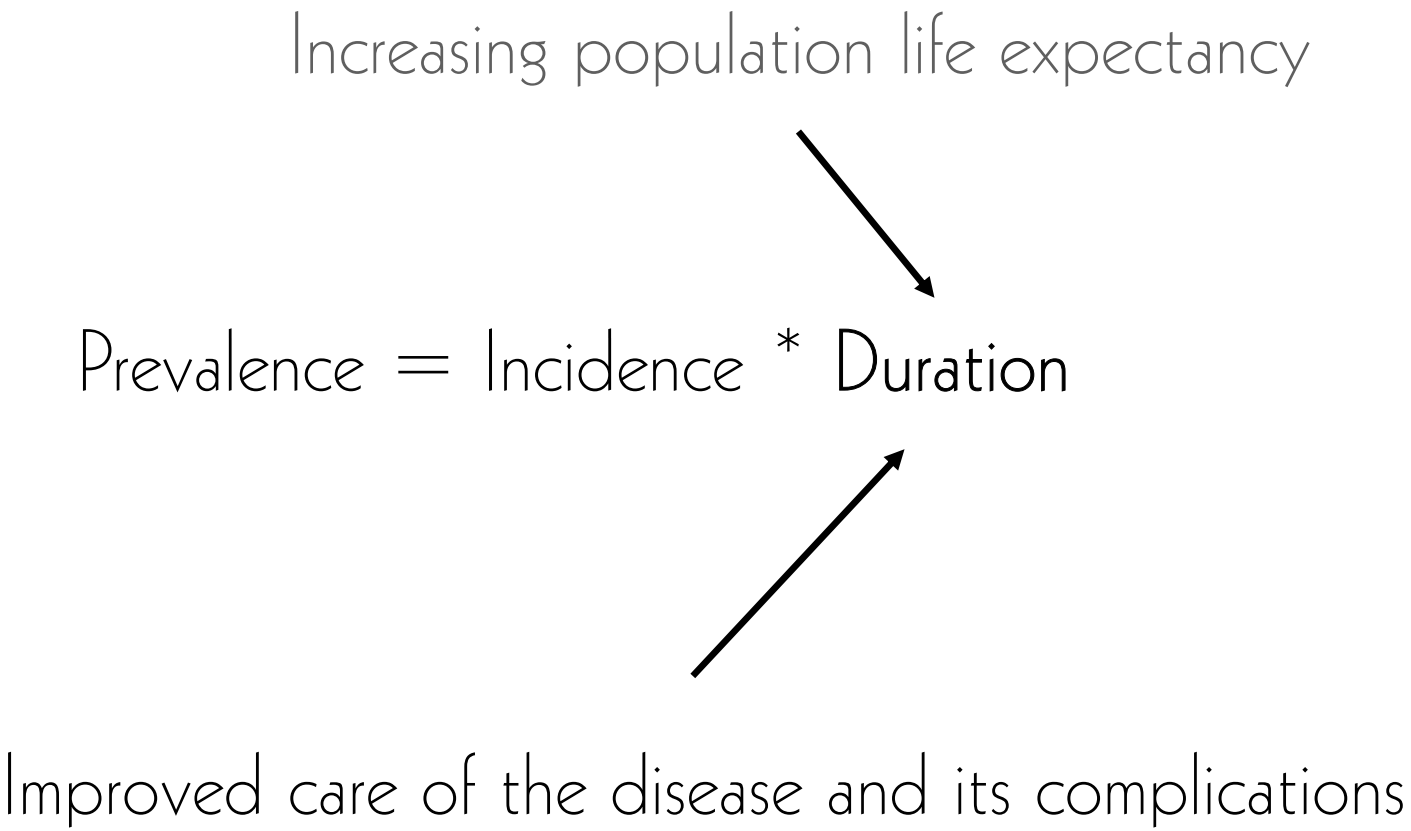
- One of the myths of the modern world is that health is determined largely by individual choice.
- The myth is particularly exemplified in the area of NCDs such as type 2 diabetes.
- Changes in work patterns from heavy labour to sedentary, the increase in computerization and mechanization, and improved transport are just a few of the changes that have had an impact on human health
- Zimmet P, Alberti KG, Shaw J. Global and societal implications of the diabetes epidemic. Nature. 2001;414:782-7. Review.

Impatto sulla salute del diabete tipo 2

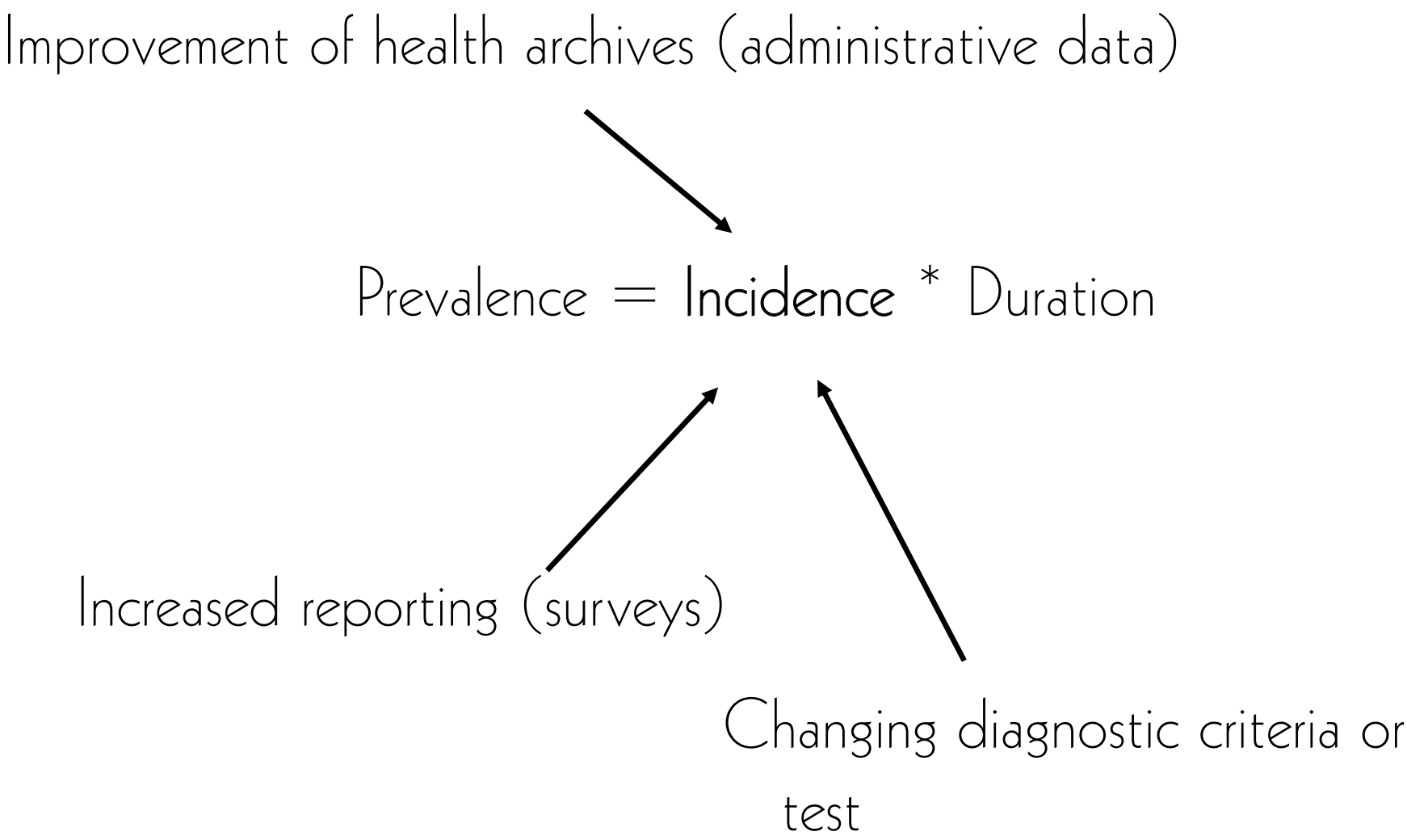
Incidence and prevalence

- The increase in prevalence of diabetes is attributable to several factors, including enhanced case detection, decreased mortality, and true increase in incidence
- In France, experts in diabetology estimate the number of patients with diabetes at 1.5 to 3 million. This estimate may increase, as a result of recent modifications to the diabetes diagnostic criteria [3] for the prevalence of type 2 diabetes.

Prevalenza e incidenza



Reporting and defining



Estimates and projections

Table 2. Estimates and projections of type 2 diabetes prevalence in Europe 1995–2010[a]

Country	Population	1995	2000	2010
Finland	5 100 000	243 000	237 000	238 000
Denmark	5 200 000	171 000	195 000	241 000
UK	58 000 000	1 076 000	1 863 000	2 880 000
Germany	81 000 000	2 715 000	3 353 000	4 244 000
Italy	57 000 000	2 635 000	2 824 000	3 172 000
Spain	39 500 000	1 652 000	1 744 000	1 859 000
France	58 000 000	1 147 000	1 880 000	2 784 000

Amos AF, McCarty DJ, Zimmet P. The rising global burden of diabetes and its complications: estimates and projections to the year 2010. Diabet Med 1997; 14(Suppl. 5): S1–S85.

Global Prevalence of Diabetes

Estimates for the year 2000 and projections for 2030

- **The number of people with diabetes** is increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity
- Italy 2000 prevalence % 7.4
- 2030 prevalence %10.6

GP and diabetes

- to estimate the prevalence and incidence of diabetes mellitus, we performed the SESAM (Sächsiche epidemiologische Studie in der Allgemeinmedizin) 2-study in cooperation with general practitioners (GPs)
- Of the diabetic patients, 3.5% (n = 44) suffered from type 1-diabetes, while type 2-diabetes was found in 66.9% (n = 848) of the cases. "Other diabetes" was determined in 19.2% (n = 244), and "not further specified diabetes", in 10.4% (n = 132) of the cases
- Epidemiology of diabetes mellitus in German general practitioners' consultation--results of the SESAM 2-study. Frese T, Sandholzer H, Voigt S, Voigt R. Exp Clin Endocrinol Diabetes. 2008;116:326-8.

Circulatory disorders associated with diabetes

Circulatory disorders associated with diabetes include

- coronary heart disease (CHD),
- stroke,
- peripheral arterial disease,
- cardiomyopathy, and
- congestive heart failure.

Danno alla salute legato al T2DM

CHD

- Prevalence of ischemic heart disease among persons with diabetes was about
- 14 times the rate among those without diabetes in persons 18 to 44 years of age (2.7% vs. 0.2 %),
- 3 times as high in persons 45 to 64 years of age (14.3% vs. 4.7%), and almost
- twice as high in those 65 years of age or older (20% vs. 12%)

Eye, Kidney, and Lower-Extremity Disease

- Diabetic retinopathy,
- the leading cause of blindness (visual acuity 20/200) in persons age 20 to 64 years, accounts for
- 12% of all new cases of blindness and leads to 12 000 to 24 000 new cases each year in the United States
- 25% of all persons with diabetes had considerable visual impairment, approximately double the proportion among persons without diabetes

Eye, Kidney, and Lower-Extremity Disease

- In the United States in 2000, diabetic nephropathy accounted for more than 40% of new cases of end-stage renal disease
- Elevated rates of lower-extremity amputations among persons with diabetes. An estimated 15% of persons with diabetes will have a diabetic foot ulcer during their lifetime (24); of these, 6% to 43% will ultimately undergo a lower-extremity amputation

Acute Metabolic Complications

- Diabetic ketoacidosis is an acute metabolic complication that may require hospitalization and even result in death
- Population-based data on the occurrence of hypoglycemia are scant, but 2 major clinical trials that carefully assessed its significance found that intensive glycemic control increases the risk for hypoglycemia

Disability

- Persons with diabetes suffer disproportionately from physical and cognitive disability.
- The National Health Interview Survey indicates that persons with diabetes have about twice the prevalence of physical disability as persons without diabetes (66% vs. 29%; *P 0.001)*
- Several prospective studies that used repeated neuropsychological tests and diagnostic protocols found an approximate doubling of the overall risk for dementia in persons with diabetes compared with those without diabetes

Cognitive impairment: an increasingly important complication of type 2 diabetes:

- Persons with type 2 diabetes have poorer cognitive performance than normoglycemics, particularly in PS. Those with undiagnosed diabetes have the lowest cognitive performance.

- Saczynski JS, Jónsdóttir MK, Garcia ME, Jonsson PV, Peila R, Eiriksdottir G, Olafsdottir E, Harris TB, Gudnason V, Launer LJ. Cognitive impairment: an increasingly important complication of type 2 diabetes: the age, gene/environment susceptibility--Reykjavik study. Am J Epidemiol. 2008;168:1132-9.

Diabetes and depression

A meta-analysis that included 39 studies demonstrated that

- 11% of patients with diabetes met the criteria for comorbid major depressive disorder (MDD) and
- 31% experienced significant depressive symptoms; in addition,
- the prevalence of depression in patients with diabetes was significantly higher in women than men (28% and 18%, respectively; *P 0.0001)*.

Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: a meta-analysis. Diabetes Care. 2001;24:1069-1078.

Mortality

- Age-adjusted mortality among adults with diabetes is about twice that of people who do not have diabetes
- A large meta-analysis that included 10 prospective studies found a relative risk of 1.9 for men and 2.6 for women when their counterparts without diabetes were the referent

Diabetes and mortality figures

- the sixth leading cause of death in the United States
- This ranking is based on the 69 301 death certificates on which it was listed as the underlying cause.
- Diabetes was listed as a contributing cause of death on an additional 143 761 death certificates.
- However, only about 35% to 40% of decedents with diabetes have it listed anywhere on the death certificate, and only about 10% to 15% have it listed as the underlying cause of death.
- Thus, data from death certificates substantially underestimate the impact of diabetes

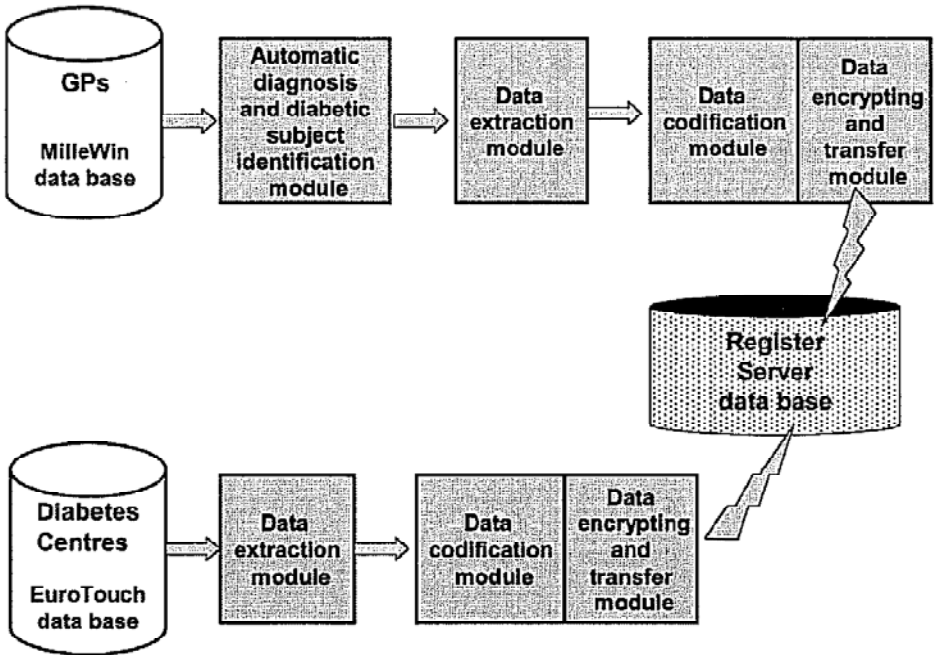
Registro del diabete

- Finalità
  - Epidemiologiche
  - Valutazione di qualità
- Fonti dei dati
- Indicatori

Registro umbro del diabete

- Surveillance
- Quality of care evaluation
  - health system
  - Process
  - diabetes control
  - outcomes
  - diseased persons
- Costs

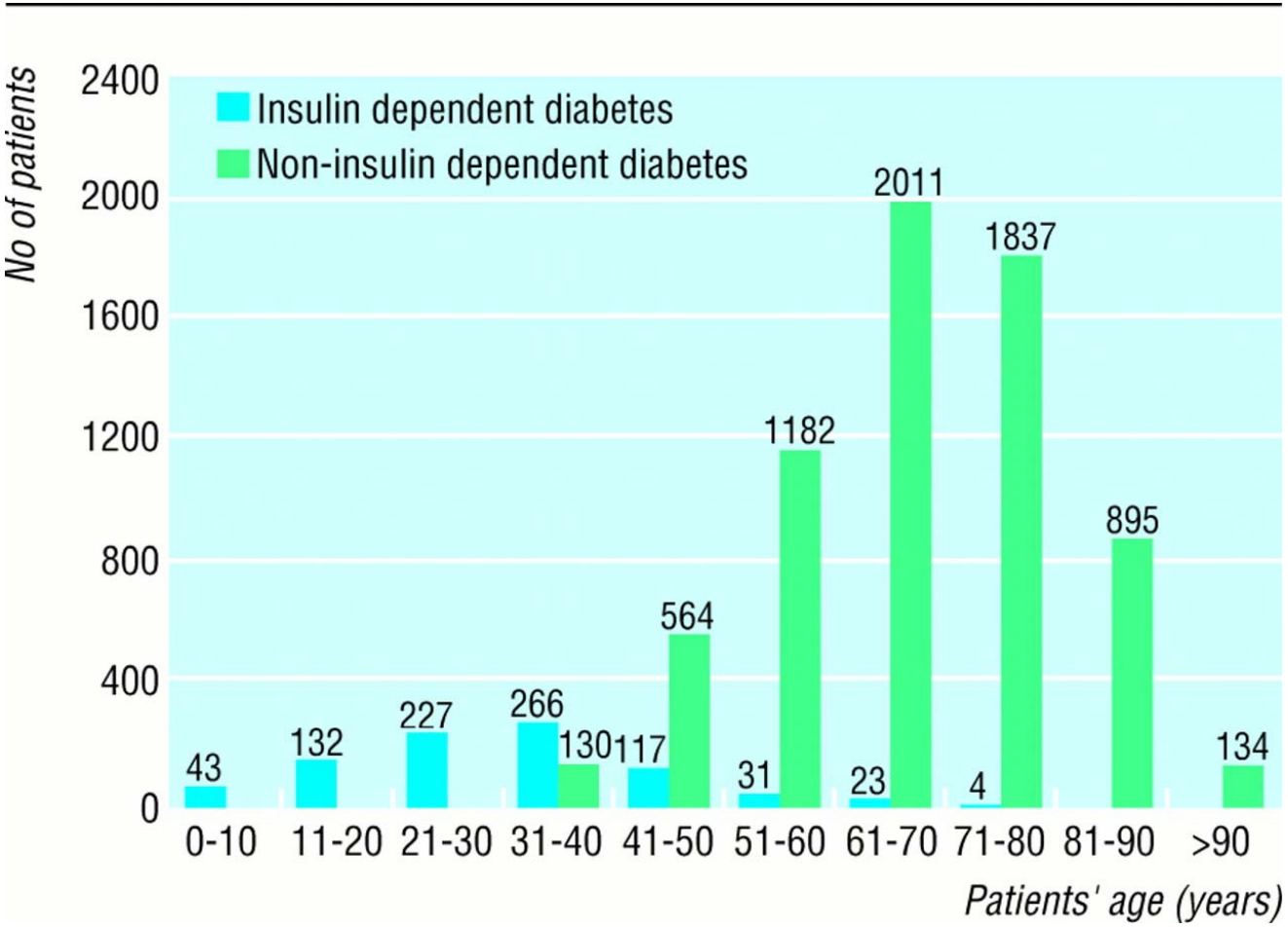
[Usually coverage is incomplete]



DARTS

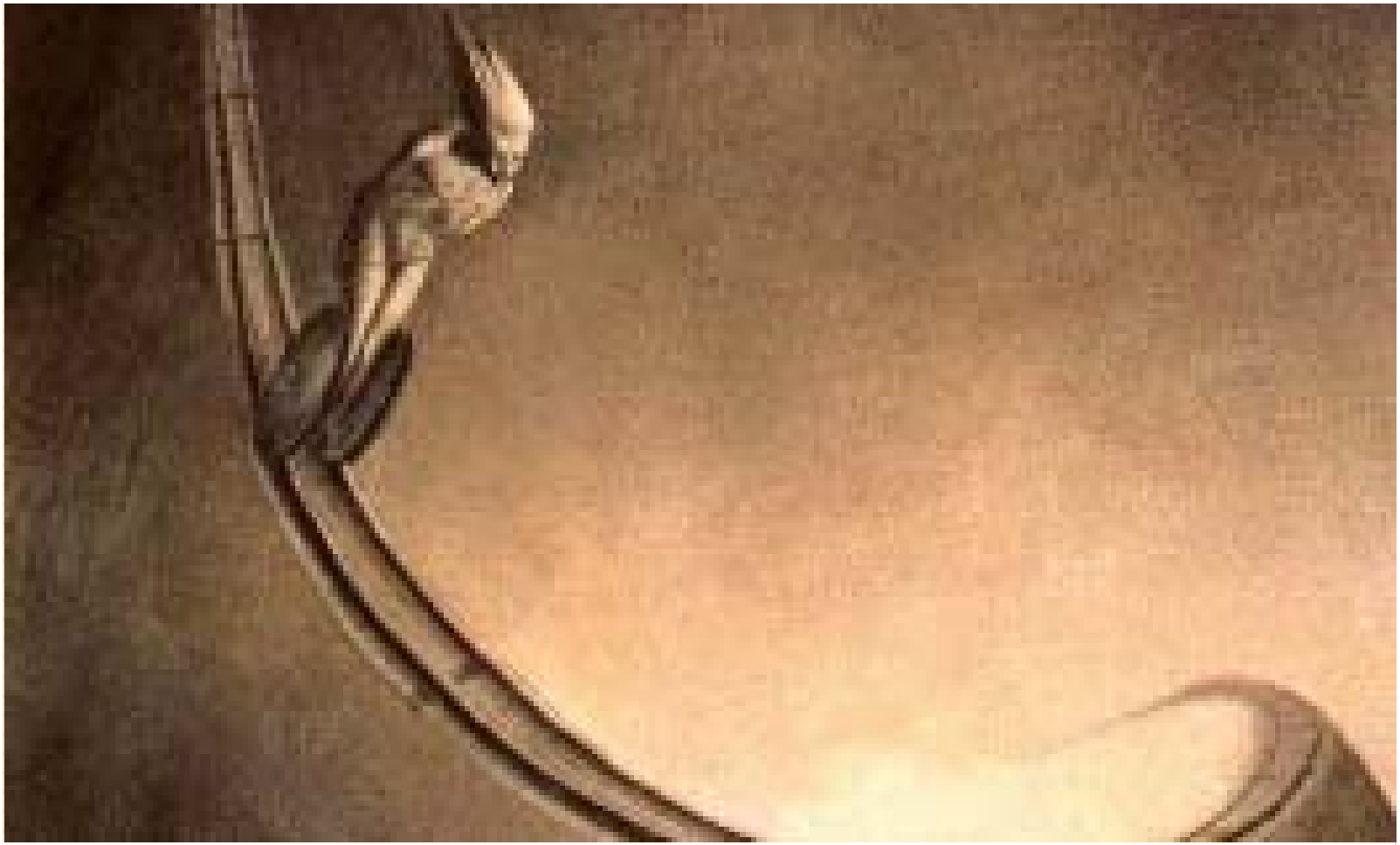
- The diabetes register records detailed clinical information for all patients diagnosed with diabetes in Tayside, Scotland.
- The study population included patients who were alive and registered with a Tayside GP for the duration of 1997 or who died in Tayside during this time.
- Eight independent data sources to maximise complete ascertainment of cases of diabetes

DARTS 2


No of patients
2400
2000
1600
1200
800
400
0
Insulin dependent diabetes
Non-insulin dependent diabetes
43
132
227
266
130
117
564
31
1182
23
2011
4
1837
895
134
0-10
11-20
21-30
31-40
41-50
51-60
61-70
71-80
81-90
>90
Patients' age (years)

GP

- Despite being population based, data collection was incomplete as only 52% of local general practices provided registers of diabetic patients and data on drug prescriptions were available for only 28% of practices. A major concern highlighted by this earlier study was that reliance on general practice registers and hospital records alone may result in 18-40% of cases of diabetes being missed.



Controllo del diabete tipo 2

Diabetes and the chronic care model

- Diabetes is often cited as a model chronic disease care
- The establishment of evaluation systems is part of chronic disease control
- Type 2 diabetes, however, has no identifiable start (i.e. diagnosis occurs because of complications or screening)
- Care is administered at different level of the health system
- Endpoints like complications are scattered in the lifetime of diabetic patients (ranging from present at the time of diagnosis to developing many years after the diagnosis)

Controllo del diabete tipo 2

- Prevenzione primaria
- Screening
- Trattamento per la prevenzione dell'insorgenza di complicanze
- Diagnosi e trattamento delle complicanze del diabete

Strategia di controllo

- Without efforts across the spectrum of primary, secondary, and tertiary prevention, we will not achieve the desired outcome of decreased morbidity and mortality for those with diabetes and fewer people who develop diabetes.

Prevenzione

- Weight loss, exercise, and diet have all been shown, separately or in combination, to be effective in decreasing the incidence of type 2 diabetes in high risk patients
- In the Finnish Prevention Study, subjects who did not lose weight but achieved the target of at least 4 hours of exercise per week had significantly decreased incidence of diabetes

Prevenzione del diabete in individui a rischio

Table 2. Diabetes prevention trials with diabetes prevention as the primary outcome

Study	Intervention	Population, *n*	NNT	TNT, *y*
Knowler et al. [18]	Lifestyle changes	IFG/IGT (*n* = 3234)	7	3
Tuomilehto et al. [17]	Lifestyle changes	IGT (*n* = 522)	8	4
Knowler et al. [18]	Metformin	IFG/IGT (*n* = 3234)	14	3
DREAM (rosiglitazone) [27••,39]	Thiazolidinediones	IFG/IGT (*n* = 5269)	7	3
Chiasson et al. [30]	Acarbose	IFG/IGT (*n* = 1429)	11	3.3
DREAM (ramipril) [27••,39]	ACEIs	IFG/IGT (*n* = 5269)	NS	NS
Torgerson et al. [46]	Xenical*	All obese (*n* = 3305)	36	4
	Xenical*	Obese + IGT (*n* = 694)	10	4

*Roche Laboratories, Basel, Switzerland.
ACEIs—angiotensin-converting enzyme inhibitors; DREAM—Diabetes Reduction Assessment with Ramipril and Rosiglitazone Medication; IFG—impaired fasting glucose; IGT—impaired glucose tolerance; NNT—number needed to treat; NS—not significant; TNT—time needed to treat.

Due to the overall beneficial health effects, lifestyle interventions should be the first line of management in prediabetic patients, followed by other interventions

Evidenze Cochrane

- Search strategy
  We carried out a comprehensive search of databases including the Cochrane Library, MEDLINE and EMBASE to identify trials. Bibliographies of relevant papers were searched, and hand searching of relevant publications was undertaken to identify additional trials (Date of last search November 2002).
- Selection criteria
  Randomised controlled trials and controlled clinical trials of the effects of a specialist nurse practitioner on short and long term diabetic outcomes were included in the review.
- Data collection and analysis
  Three investigators performed data extraction and quality scoring independently; any discrepancies were resolved by consensus.
- Main results
  Six trials including 1382 participants followed for six to 12 months were included. Two trials were in adolescents. Due to substantial heterogeneity between trials a meta-analysis was not performed. Glycated haemoglobin (HbA1c) in the intervention groups was not found to be significantly different from the control groups over a 12 month follow up period. One study demonstrated a significant reduction in HbA1c in the presence of the diabetes specialist nurse/nurse case manager at 6 months. Significant differences in episodes of hypoglycaemia and hyperglycaemia between intervention and control groups were found in one trial. Where reported, emergency admissions and quality of life were not found to be significantly different between groups. No information was found regarding BMI, mortality, long term diabetic complications, adverse effects, or costs.

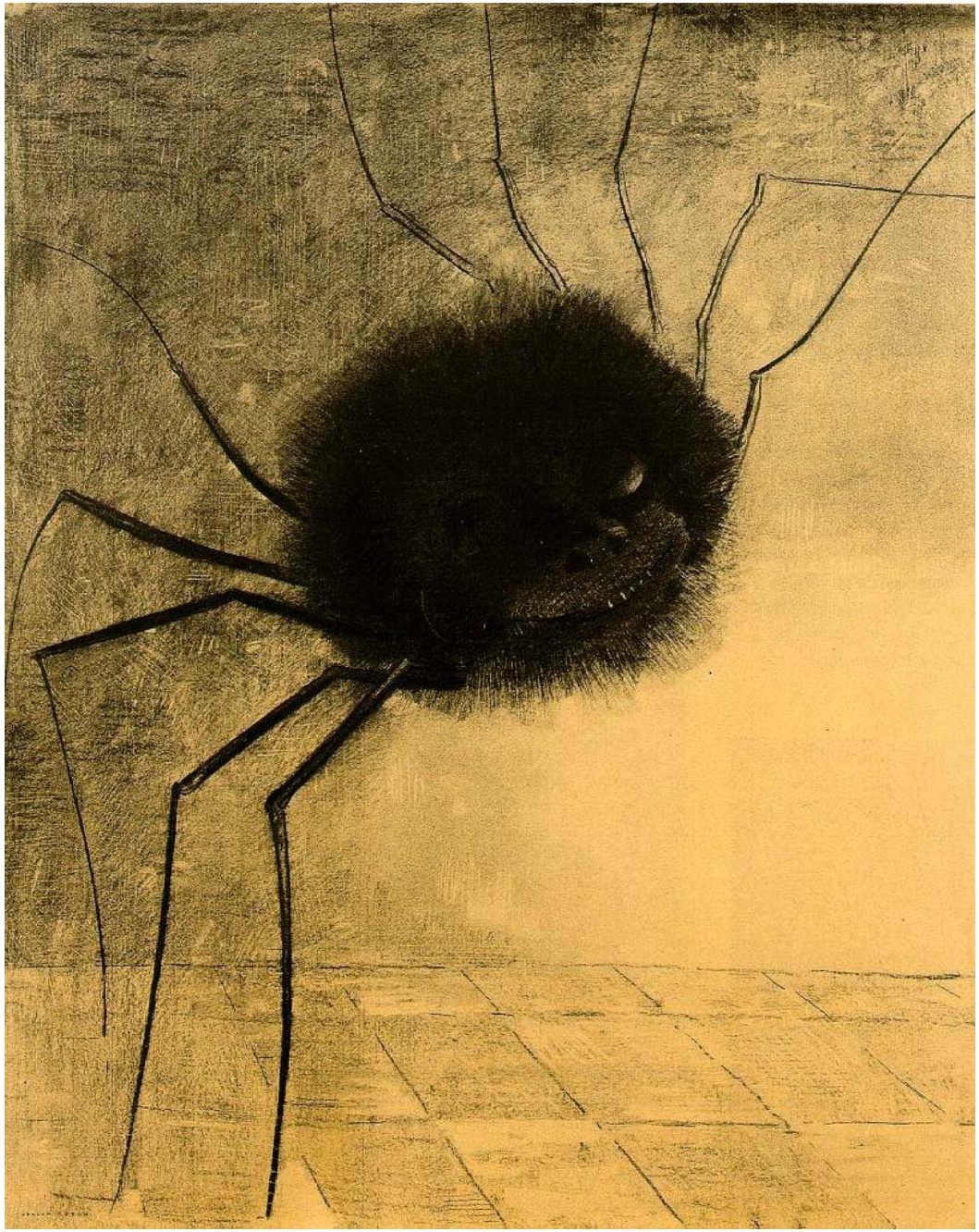
Whole grain foods for the prevention of type 2 diabetes mellitus

- Background
  Diet as one aspect of lifestyle is thought to be one of the modifiable risk factors for the development of type 2 diabetes mellitus (T2DM). Information is needed as to which components of the diet could be protective for this disease.
- Authors' conclusions

  The evidence from only prospective cohort trials is considered to be too weak to be able to draw a definite conclusion about the preventive effect of whole grain foods on the development of T2DM. Properly designed long-term randomised controlled trials are needed. To facilitate this, further mechanistic research should focus on finding a set of relevant intermediate endpoints for T2DM and on identifying genetic subgroups of the population at risk that are most susceptible to dietary intervention.

Public policy

- Major shifts in public policy are necessary to create an environment for the whole community or nation in which individual behavioural initiatives can succeed. This may require changes in taxation and reimbursement for health promotion, provision of safe conditions (for example, from assault or traffic) for the elderly and younger sectors of the community, as well as community and workplace access to facilities for exercise.



Undetected type 2 diabetes in older adults

- a large proportion of older adults with T2D were undiagnosed. Screening efforts for T2D should address those exhibiting characteristics of the metabolic syndrome in a seemingly healthy population of older adults

The Missed Patient with Diabetes: How Access to Health Care Affects the Detection of Diabetes

- This study examined the association between access to health care and 3 classifications of diabetes status: diagnosed, undiagnosed, and no diabetes

- Limited access to health care, especially being uninsured and going without insurance for a long period, was significantly associated with being a "missed patient" with diabetes.

- Zhang X, Geiss LS, Cheng YJ, Beckles GL, Gregg EW, Kahn HS. Diabetes Care. 2008 Jun 12. [Epub ahead of print]

Type 2 diabetes meets many of the criteria for suitability for screening

- Type 2 diabetes often goes undiagnosed for many years because hyperglycemia develops gradually and may not produce symptoms
- The prevalence of macrovascular complications is elevated in persons with prediabetes (defined as impaired fasting glucose, impaired glucose tolerance, or both) and in persons with newly diagnosed diabetes
- Diabetes has a long preclinical phase, estimated at 10 to 12 years on the basis of the progression of microvascular complications, and
- valid and reliable tests can detect type 2 diabetes during this asymptomatic period

Defining criteria for organized screenings according to Hakama and colleagues[a]

a. The target population has been identified;
b. individual people are identifiable;
c. mechanisms are implemented to guarantee high coverage and attendance (e.g., a personal letter of invitation);
d. there are adequate field facilities for performing the screening tests;
e. there is a defined quality control program concerning how the tests are performed and interpreted;
f. adequate facilities exist for diagnosis and for the appropriate treatment of confirmed abnormalities;
g. there is a carefully designed and agreed upon referral system, an agreed link between the participant, the screening center, and the clinical facility for diagnosis of an abnormal screening test, for management of any abnormalities found, and for providing information about normal screening tests; and
h. evaluation and monitoring of the total program is organized in terms of incidence and mortality rates among those attending, among those not attending, at the level of the total target population. Quality control of the epidemiologic data should be established.

[a]Hakama M, Chamberlain J, Day NE, Miller AB, Prorok PC (1985). Evaluation of screening programmes for gynaecological cancer. Br J Cancer **52**, 669–673.

Evidence of efficacy

- Direct evidence is lacking on the health benefits of detecting type 2 diabetes by either targeted or mass screening, and indirect evidence also fails to demonstrate health benefits for screening general populations.
- Persons with hypertension probably benefit from screening, because blood pressure targets for persons with diabetes are lower than those for persons without diabetes.
- Intensive lifestyle and pharmacotherapeutic interventions reduce the progression of prediabetes to diabetes, but few data examine the effect of these interventions on long-term health outcomes.
- Norris SL, Kansagara D, Bougatsos C, Fu R; U.S. Preventive Services Task Force. Screening adults for type 2 diabetes: a review of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med. 2008 Jun 3;148:855-68. Review.

US Preventive Task Force

- Screening for diabetes in patients with hypertension or hyperlipidemia should be part of an integrated approach to reduce cardiovascular risk. Lower targets for blood pressure (that is, diastolic blood pressure 80 mm Hg) are beneficial for patients with diabetes and high blood pressure.
- Screening for type 2 diabetes mellitus in adults: recommendations and rationale. U.S. Preventive Services Task Force. Ann Intern Med. 2003 Feb 4;138:212-4.

Health Technol Assess

- Screening could be two-stage, starting with the selection of people at higher risk.
- The second-stage choice of test for blood glucose [The best test is the oral glucose tolerance test (OGTT), but it is the most expensive, is inconvenient and has weak reproducibility. Fasting plasma glucose would miss people with IGT. Glycated haemoglobin does not require fasting, and may be the best compromise]
- Screening for type 2 diabetes: literature review and economic modelling. Waugh N, Scotland G, McNamee P, Gillett M, Brennan A, Goyder E, Williams R, John A. Health Technol Assess. 2007 May;11(17):iii-iv, ix-xi, 1-125. Review.

Criteria for appraising the viability, effectiveness and appropriateness of a screening programme

- Ideally all the following criteria should be met before screening for a condition is initiated:
- **The Condition**
- 1. The condition should be an important health problem
- 2. The epidemiology and natural history of the condition, including development from latent to declared disease, should be adequately understood and there should be a detectable risk factor, disease marker, latent period or early symptomatic stage
- 3. All the cost-effective primary prevention interventions should have been implemented as far as practicable
- 4 If the carriers of a mutation are identified as a result of screening the natural history of people with this status should be understood, including the psychological implications.

The Test

5 There should be a simple, safe, precise and validated screening test

6 The distribution of test values in the target population should be known and a suitable cut-off level defined and agreed

7 The test should be acceptable to the population

8 There should be an agreed policy on the further diagnostic investigation of individuals with a positive test result and on the choices available to those individuals.

9 If the test is for mutations the criteria used to select the subset of mutations to be covered by screening, if all possible mutations are not being tested, should be clearly set out.

The Treatment

10 There should be an effective treatment or intervention for patients identified through early detection, with evidence of early treatment leading to better outcomes than late treatment nsc/criteria/24/3/03 2

11 There should be agreed evidence based policies covering which individuals should be offered treatment and the appropriate treatment to be offered

12 Clinical management of the condition and patient outcomes should be optimised in all health care providers prior to participation in a screening programme

The Screening programme

13 There should be evidence from high quality Randomised Controlled Trials that the screening programme is effective in reducing mortality or morbidity. Where screening is aimed solely at providing information to allow the person being screened to make an "informed choice" (eg. Down's syndrome, cystic fibrosis carrier screening), there must be evidence from high quality trials that the test accurately measures risk. The information that is provided about the test and its outcome must be of value and readily understood by the individual being screened.

14 There should be evidence that the complete screening programme (test, diagnostic procedures, treatment/ intervention) is clinically, socially and ethically acceptable to health professionals and the public

15 The benefit from the screening programme should outweigh the physical and psychological harm (caused by the test, diagnostic procedures and treatment)

16. The opportunity cost of the screening programme (including testing, diagnosis and treatment, administration, training and quality assurance)) should be economically balanced in relation to expenditure on medical care as a whole (ie. value for money).

17. There should be a plan for managing and monitoring the screening programme and an agreed set of quality assurance standards

18. Adequate staffing and facilities for testing, diagnosis, treatment and programme management should be available prior to the commencement of the screening programme

The Screening programme

- 19 All other options for managing the condition should have been considered (e.g. improving treatment, providing other services), to ensure that no more cost effective intervention could be introduced or current interventions increased within the resources available.
- 20 Evidence-based information, explaining the consequences of testing, investigation and treatment, should be made available to potential participants to assist them in making an informed choice.
- 21. Public pressure for widening the eligibility criteria for reducing the screening interval, and for increasing the sensitivity of the testing process, should be anticipated. Decisions about these parameters should be scientifically justifiable to the public. nsc/criteria/24/3/03 3
- 22 If screening is for a mutation the programme should be acceptable to people identified as carriers and to other family members.

NSC e diabete

- Screening for diabetes meets most of the NSC criteria, but probably fails on three:
- criterion 12, on optimisation of existing management of the condition;
- criterion 13, which requires that there should be evidence from highquality randomised controlled trials (RCTs) showing that a screening programme would reduce mortality or morbidity; and
- criterion 18, that there should be adequate staffing and facilities for all aspects of the programme.

Self-monitoring of blood glucose in patients with type 2 diabetes mellitus who are not using insulin

- Background

  Self-monitoring of blood glucose (SMBG) has been found to be effective for patients with type 1 diabetes and for patients with type 2 diabetes using insulin. There is much debate on the effectiveness of SMBG as a tool in the self-management for patients with type 2 diabetes who are not using insulin

- Authors' conclusions

  From this review we concluded that self-monitoring of blood glucose might be effective in improving glycaemic control in patients with type 2 diabetes who are not using insulin. To assess the potential beneficial effects of SMBG in these patients a large and well-designed randomised controlled trial is required. This long-term trial should also investigate patient-related outcomes like quality of life, well-being and patient satisfaction, and provide adequate education to the patient to allow SMBG to be effective.

Omega-3 polyunsaturated fatty acids (PUFA) for type 2 diabetes mellitus

- Background

  People with type 2 diabetes mellitus are at increased risk from cardiovascular disease. Dietary omega-3 polyunsaturated fatty acids (PUFAs) are known to reduce triglyceride levels, but their impact on cholesterol levels, glycemic control and vascular outcomes are not well known.

- Authors' conclusions

  Omega-3 PUFA supplementation in type 2 diabetes lowers triglycerides and VLDL cholesterol, but may raise LDL cholesterol (although results were non-significant in subgroups) and has no statistically significant effect on glycemic control or fasting insulin. Trials with vascular events or mortality defined endpoints are needed.

Physical inactivity, diabetes, and depression

- Recent evidence suggests that aerobic exercise at levels consistent with public health recommendations is as effective as antidepressant medications in treating mild to moderate depression a common comorbidity affecting approximately one-quarter of patients with diabetes and hindering optimal diabetes self-care

Long-term non-pharmacological weight loss interventions for adults with type 2 diabetes mellitus

- Background

  Most persons with type 2 diabetes are overweight and obesity worsens the metabolic and physiologic abnormalities associated with diabetes.

- Authors' conclusions

  Weight loss strategies using dietary, physical activity, or behavioral interventions produced small between-group improvements in weight. These results were minimized by weight loss in the comparison group, however, and examination of individual study arms revealed that multicomponent interventions including very low calorie diets or low calorie diets may hold promise for achieving weight loss in adults with type 2 diabetes.

Treatments for gestational diabetes and impaired glucose tolerance in pregnancy

- Main results

  Three studies with a total of 223 women were included. All three included studies involved women with IGT. No trials reporting treatments for gestational diabetes met the criteria. There are insufficient data for any reliable conclusions about the effect of treatments for IGT on perinatal outcome. The difference in abdominal operative delivery rates is not statistically significant (relative risk (RR) 0.86, 95% confidence interval 0.51 to 1.45) and the effect on special care baby unit admission is also not significant (RR 0.49, 95% confidence interval (CI) 0.19 to 1.24). Reduction in birthweight greater than 90th centile (RR 0.55, 95% CI 0.19 to 1.61) was not found to be significant. This review suggests that an interventionist policy of treatment may be associated with a reduced risk of neonatal hypoglycaemia (RR 0.25, 95% CI 0.07 to 0.86). No other statistically significant differences were detected. A number of outcomes are only reported by one study resulting in a small sample and wide confidence intervals.

Very tight versus tight control for diabetes in pregnancy

- Background
  Pregnancies complicated by pre-existing insulin dependent diabetes are high risk for a number of poor pregnancy and neonatal outcomes.
- Authors' conclusions

  There appears to be no clear evidence of benefit from very tight glycaemic control for pregnant diabetic women. Since very strict control may have a substantial impact on lifestyle, this suggests caution in advising such a degree of control.

Treatments for gestational diabetes and impaired glucose tolerance in pregnancy

- Background

  Gestational diabetes and impaired glucose tolerance (IGT) in pregnancy affects between 3 and 6% of all pregnancies and both have been associated with pregnancy complications. A lack of conclusive evidence has led clinicians to equate the risk of adverse perinatal outcome with pre-existing diabetes. Consequently, women are often intensively managed with increased obstetric monitoring, dietary regulation, and in some cases insulin therapy. However, there has been no sound evidence base to support intensive treatment. The key issue for clinicians and consumers is whether treatment of gestational diabetes and IGT will improve perinatal outcome.

- Authors' conclusions

  There are insufficient data for any reliable conclusions about the effects of treatments for impaired glucose tolerance on perinatal outcome.

Metformin monotherapy for type 2 diabetes mellitus

- Background

  Metformin is an anti-hyperglycaemic agent used for the treatment of type 2 diabetes mellitus. Type 2 diabetes may present long-term complications: micro- (retinopathy, nephropathy and neuropathy) and macrovascular (stroke, myocardial infarction and peripheral vascular disease). Two meta-analyses have been published before, although only secondary outcomes were assessed.

- Authors' conclusions

  Metformin may be the first therapeutic option in the diabetes mellitus type 2 with overweight or obesity, as it may prevent some vascular complications, and mortality. Metformin produces beneficial changes in glycaemia control, and moderated in weight, lipids, insulinaemia and diastolic blood pressure. Sulphonylureas, alpha-glucosidase inhibitors, thiazolidinediones, meglitinides, insulin, and diet fail to show more benefit for glycaemia control, body weight, or lipids, than metformin.

Insulin monotherapy versus combinations of insulin with oral hypoglycaemic agents in patients with type 2 diabetes mellitus

- Background

  It is unclear whether patients with type 2 diabetes who have poor glycaemic control despite maximal oral hypoglycaemic agents (OHAs) should be commenced on insulin as monotherapy, or insulin combined with oral hypoglycaemic agents (insulin-OHA combination therapy).

- Authors' conclusions

  Bedtime NPH insulin combined with oral hypoglycaemic agents provides comparable glycaemic control to insulin monotherapy and is associated with less weight gain if metformin is used.

Trattamento

Indicatori

Table 1. National Diabetes Quality Improvement Alliance and Additional Indicators of Diabetes Processes and Outcomes of Care*

Indicators (Accountability)	Measures (Quality Improvement)	Data Source†
Alliance indicators (proportion of persons)		
Hemoglobin A_{1c} > 9.0% (poor glycemic control)	Distribution of hemoglobin A_{1c}: <6.0%, 6.0%–6.9%, 7.0%–7.9%, 8.0%–8.9%, 9.0%–9.9%, ≥10.0%	NHANES
Receiving annual lipid test		BRFSS
LDL cholesterol level < 3.4 mmol/L (<130 mg/dL)	Distribution of LDL cholesterol level: <2.6 mmol/L (<100 mg/dL), 2.6–3.3 mmol/L (100–129 mg/dL), 3.4–4.1 mmol/L (130–159 mg/dL), ≥4.2 mmol/L (≥160 mg/dL) Distribution of total cholesterol level: <5.2 mmol/L (<200 mg/dL), 5.2–6.1 mmol/L (200–239 mg/dL), ≥6.2 mmol/L (≥240 mg/dL) Distribution of HDL cholesterol level: <1.0 mmol/L (<40 mg/dL), 1.0–1.2 mmol/L (40–49 mg/dL), 1.3–1.4 mmol/L (50–59 mg/dL), ≥1.5 mmol/L (≥60 mg/dL) Distribution of triglyceride level: <1.7 mmol/L (<150 mg/dL), 1.7–2.1 mmol/L (150–199 mg/dL), 2.2–4.4 mmol/L (200–399 mg/dL), ≥4.5 mmol/L (≥400 mg/dL)	NHANES
BP < 140/90 mm Hg	Distribution of systolic BP: <120 mm Hg, 120–129 mm Hg, 130–139 mm Hg, 140–149 mm Hg, 150–159 mm Hg, 160–169 mm Hg, 170–179 mm Hg, ≥180 mm Hg Distribution of diastolic BP: <75 mm Hg, 75–79 mm Hg, 80–89 mm Hg, 90–99 mm Hg, 100–109 mm Hg, ≥110 mm Hg	NHANES

Improvements in diabetes processes of care and intermediate outcomes: United States, 1988-2002. Saaddine JB, Cadwell B, Gregg EW, Engelgau MM, Vinicor F, Imperatore G, Narayan KM. Ann Intern Med. 2006;144:465-74.

Indicatori segue

Receiving annual microalbuminuria test‡		NA
Receiving dilated eye examination§		BRFSS
Receiving a well-documented foot examination		BRFSS
Smoking	Proportion of patients who are smokers; proportion of smokers who were recommended or were offered an intervention for smoking cessation (counseling and/or therapy)	BRFSS
Receiving aspirin therapy	Proportion receiving aspirin therapy to prevent CVD	BRFSS
Receiving influenza vaccine	Proportion of persons receiving influenza vaccine	BRFSS
Additional measures (proportion of persons)		
Receiving pneumococcal vaccine		BRFSS
Receiving diabetes education		BRFSS
Self-monitoring blood glucose level (at least once daily)		BRFSS
Receiving annual dental examination		BRFSS

Table 3. **Proportion of Persons with Diabetes 18 to 75 Years of Age Who Received Processes and Intermediate Outcomes of Care for Diabetes: National Health and Nutrition Examination Survey, 1988–1994 and 1999–2002, and Behavioral Risk Factors Surveillance System, 1995 and 2002***

Indicator	Baseline Surveys (1990s), %	Recent Surveys (2000s), %	Absolute Change (95% CI), *percentage points*
National Diabetes Quality Improvement Alliance indicators			
Hemoglobin $A_{1c} > 9.0\%$	24.5	20.6	–3.9 (–10.4 to 2.5)
Annual lipid profile	76.3	84.6	8.3 (4.0 to 12.7)
LDL cholesterol level < 3.4 mmol/L (<130 mg/dL)	42.4	64.2	21.9 (12.4 to 31.3)
Blood pressure < 140/90 mm Hg	67.6	68.0	0.4 (–6.0 to 6.7)
Absence of microalbuminuria	65.2	66.9	1.7 (–4.0 to 7.3)
Annual dilated eye examination	63.2	67.7	4.5 (0.5 to 8.5)
Annual foot examination	64.5	68.3	3.8 (–0.1 to 7.7)
Annual influenza vaccination	45.7	52.5	6.8 (2.9 to 10.7)
Aspirin therapy†	32.0	45.1	13.1 (5.4 to 20.7)
Smokers	20.0	19.3	–0.7 (–4.6 to 3.1)
Smokers who are trying to quit smoking	43.6	62.2	18.7 (7.6 to 29.7)
Additional indicators			
Pneumococcal vaccination	26.5	43.0	16.5 (12.7 to 20.2)
Diabetes education	NA	54.9	
Self-monitoring blood glucose level (at least once daily)	38.5	55.1	16.6 (12.7 to 20.5)
Annual dental examination	57.6	57.0	–0.6 (–6.4 to 5.3)

Table 4. Distribution of National Diabetes Quality Improvement Alliance Quality Improvement Measures among Persons with Diabetes 18 to 75 Years of Age: National Health and Nutrition Examination Survey, 1988–1994 and 1999–2002, and Behavioral Risk Factors Surveillance System, 1995 and 2002*

Quality Improvement Measures	Baseline (1990s)	Recent (2000s)	Difference (95% CI), *percentage points*
Mean (±SE) hemoglobin A_{1c}, %	7.8 ± 0.1	7.7 ± 0.1	–0.1 (–0.4 to 0.3)
Hemoglobin A_{1c}, %			
<6.0%	23.4	16.4	–7.0 (–13.8 to –0.1)
6.0%–6.9%	17.9	25.9	8.0 (2.7 to 13.3)
7.0%–7.9%	16.3	21.1	4.8 (0.7 to 9.0)
8.0%–8.9%	17.0	15.4	–1.6 (–7.9 to 4.9)
9.0%–9.9%	10.0	6.7	–3.3 (–6.7 to 0.0)
≥10.0%	15.4	14.4	–1.0 (–6.4 to 4.4)
Mean (±SE) total cholesterol level			
mmol/L	5.7 ± 0.08	5.4 ± 0.08	–0.3 (–0.6 to –0.1)
mg/dL	222.9 ± 2.9	209.1 ± 3.2	–13.8 (–22.3 to –5.3)

Total cholesterol level, %			
<5.2 mmol/L (<200 mg/dL)	32.6	47.4	14.8 (8.1 to 21.6)
5.2–6.1 mmol/L (200–239 mg/dL)	33.6	32.8	–0.8 (–8.1 to 6.5)
≥6.2 mmol/L (≥240 mg/dL)	33.8	19.8	–14.0 (–20.7 to –7.3)
Mean (±SE) LDL cholesterol level			
mmol/L	3.6 ± 0.06	3.1 ± 0.06	–0.5 (–0.6 to –0.3)
mg/dL	138.1 ± 2.3	119.3 ± 2.2	–18.8 (–25.0 to –12.5)
LDL cholesterol level, %			
<2.6 mmol/L (<100 mg/dL)	10.8	33.8	23.0 (14.2 to 31.9)
2.6–3.3 mmol/L (100–129 mg/dL)	31.6	30.4	–1.2 (–12.8 to 10.5)
3.4–4.1 mmol/L (130–159 mg/dL)	34.0	24.1	–9.9 (–20.8 to 1.0)
≥4.2 mmol/L (≥160 mg/dL)	23.6	11.6	–12.0 (–21.2 to –2.9)
Mean (±SE) HDL cholesterol level			
mmol/L	1.2 ± 0.02	1.2 ± 0.06	0.0 (–0.05 to 0.05)
mg/dL	45.5 ± 0.8	45.6 ± 0.8	0.1 (–1.9 to 2.0)
HDL cholesterol level, %			
<1.0 mmol/L (<40 mg/dL)	38.0	33.8	–4.2 (–11.1 to 2.8)
1.0–1.3 mmol/L (40–49 mg/dL)	28.7	35.9	7.2 (0.8 to 13.5)
1.31–1.49 mmol/L (50–59 mg/dL)	17.5	17.3	–0.2 (–4.9 to 4.5)
≥1.5 mmol/L (≥ 60 mg/dL)	15.9	13.1	–2.8 (–8.4 to 2.7)
Geometric mean (95% CI) triglyceride level			
mmol/L	2.1 (1.9 to 2.4)	1.8 (1.7 to 1.9)	–0.3 (–0.6 to 0.0)
mg/dL	186.8 (165.7 to 210.6)	160.8 (148.4 to 174.2)	–26.0 (–51.3 to –0.7)

Triglyceride level, %			
<1.7 mmol/dL (<150 mg/dL)	40.2	47.2	7.0 (–3.0 to 17.0)
1.7–2.2 mmol/L (150–199 mg/dL)	19.1	18.9	–0.2 (–9.3 to 9.0)
2.3–4.4 mmol/L (200–399 mg/dL)	30.7	28.0	–2.7 (–16.1 to 10.7)
≥4.5 mmol/L (≥400 mg/dL)	10.1	6.0	–4.1 (–10.8 to 2.6)
Mean (±SE) systolic blood pressure, *mm Hg*	132.0 ± 0.9	132.2 ± 1.1	0.2 (–2.5 to 2.9)
Systolic blood pressure, %			
<120 mm Hg	29.9	27.9	–2.0 (–10.0 to 6.1)
120–129 mm Hg	19.1	20.5	1.4 (–4.1 to 7.0)
130–139 mm Hg	21.5	21.9	0.4 (–5.9 to 6.7)
140–149 mm Hg	11.0	13.9	2.9 (–1.9 to 7.7)
150–159 mm Hg	8.7	6.5	–2.2 (–5.0 to 0.7)
160–169 mm Hg	4.9	3.6	–1.2 (–3.6 to 1.2)
170–179 mm Hg	2.4	2.7	0.4 (–1.3 to 2.0)
≥180 mm Hg	2.7	3.1	0.3 (–2.0 to 2.7)
Mean (±SE) diastolic blood pressure, *mm Hg*	73.6 ± 0.6	72.4 ± 0.7	–1.2 (–2.9 to 0.5)
Diastolic blood pressure, %			
<75 mm Hg	55.2	57.1	–1.9 (–5.6 to 9.3)
75–79 mm Hg	19.2	16.7	–2.5 (–8.4 to 3.4)
80–89 mm Hg	18.3	19.9	1.6 (–3.3 to 6.5)
90–99 mm Hg	6.6	4.7	–1.9 (–5.5 to 1.7)
100–109 mm Hg	0.6	1.6	1.0 (0.2 to 1.9)
≥110 mm Hg	0.1	0.02	–0.1 (–0.2 to 0.1)

Conclusion

- Overall, quality of care for people with diabetes has improved in the past 10 years, but important opportunities remain for further improvement. Currently,
- 1 in 5 people with diabetes (2.2 million people) has poor glycemic control (hemoglobin A1c 9%),
- 2 in 5 people with diabetes (3.6 million people) have poor LDL cholesterol level control (LDL cholesterol level 3.4 mmol/L [130 mg/dL]),
- 1 in 3 people with diabetes (3.5 million people) has poor blood pressure control (140/90 mm Hg), and
- 1 in 3 people with diabetes has not received annual eye (3.2 million people) or foot examinations (3.1 million people).

Ruolo della sanità pubblica

Diabete e sanità pubblica

- Whereas much of the work in improving diabetes outcomes has been focused on clinical care,
- there is growing recognition that diabetes is a public health problem that also
- requires public health approaches that are complementary to what can be done in clinical care

What is public health practice telling us about diabetes? Albright A. J Am Diet Assoc. 2008;108(4 Suppl 1):S12-8

A public health approach to diabetes:

- "a broad, multidisciplinary perspective that is
- concerned with improving outcomes in all people who have (or are at risk for) diabetes, with attention to
- equity and the most efficient use of resources in ways that
- enhance patient and community quality of life."

Glasgow RE, Wagner EH, Kaplan RM, Vinicor F, Smith L, Norman J. If diabetes is a public health problem, why not treat it as one? A population-based approach to chronic illness. Ann Behav Med. 1999; 21:159-170

The Ten Essential Public Health Strategies

1. **Monitor health status to identify community health problems.**
2. **Diagnose and investigate health problems and health hazards in the community.**
3. Inform, educate, and empower people about health issues.
4. Mobilize community partnerships to identify and solve health problems.
5. Develop policies and plans that support individual and community health efforts.
6. Enforce laws and regulations that protect health and ensure safety.
7. Link people to needed personal health services and ensure the provision of health care when otherwise unavailable.
8. Ensure a competent public health and personal health care workforce.
9. **Evaluate effectiveness, accessibility, and quality of personal and population-based health services.**
10. Research for new insights and innovative solutions to health problems.

Systems for routine surveillance for people with diabetes mellitus

- Background
  There is wide variation in the extent of general practice involvement in diabetes care.
- Objectives
  To assess the effects of involving primary care professionals in the routine review and surveillance for complications of people with established diabetes mellitus compared with secondary care specialist follow up.
- Authors' conclusions

  Unstructured care in the community is associated with poorer follow up, greater mortality and worse glycaemic control than hospital care. Computerised central recall, with prompting for patients and their family doctors, can achieve standards of care as good or better than hospital outpatient care, at least in the short term. The evidence supports provision of regular prompted recall and review of people with diabetes by willing general practitioners and demonstrates that this can be achieved, if suitable organisation is in place.

Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings

- Background

  Diabetes is a common chronic disease that is increasingly managed in primary care. Different systems have been proposed to manage diabetes care.

- Authors' conclusions

  Multifaceted professional interventions can enhance the performance of health professionals in managing patients with diabetes. Organisational interventions that improve regular prompted recall and review of patients (central computerised tracking systems or nurses who regularly contact the patient) can also improve diabetes management. The addition of patient-oriented interventions can lead to improved patient health outcomes. Nurses can play an important role in patient-oriented interventions, through patient education or facilitating adherence to treatment.

Specialist nurses in diabetes mellitus.

- AuthorLoveman, E; Royle, P; Waugh, N
  SourceCochrane Database of Systematic Reviews. 3, 2008.
- Background
  The patient with diabetes has many different learning needs relating to diet, monitoring, and treatments. In many health care systems specialist nurses provide much of these needs, usually aiming to empower patients to self-manage their diabetes. The present review aims to assess the effects of the involvement of specialist nurse care on outcomes for people with diabetes, compared to usual care in hospital clinics or primary care with no input from specialist nurses.
  Objectives
  To assess the effects of diabetes specialist nurses / nurse case manager in diabetes on the metabolic control of patients with type 1 and type 2 diabetes mellitus.

  Authors' conclusions

  The presence of a diabetes specialist nurse / nurse case manager may improve patients' diabetic control over short time periods, but from currently available trials the effects over longer periods of time are not evident. There were no significant differences overall in hypoglycaemic episodes, hyperglycaemic incidents, or hospital admissions. Quality of life was not shown to be affected by input from a diabetes specialist nurse/nurse case manager.

Fine