

# Osservatorio Epidemiologico Cardiovascolare Italiano

## *The Italian Cardiovascular Epidemiological Observatory*

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### Descrizione dello studio

L'Area Prevenzione dell'Associazione Nazionale Medici Cardiologi Ospedalieri, in collaborazione con l'Istituto Superiore di Sanità, ha attivato nel 1998 l'Osservatorio Epidemiologico Cardiovascolare Italiano, con l'obiettivo di stimare la prevalenza delle forme maggiori delle malattie cardiovascolari aterosclerotiche, i livelli medi dei fattori di rischio, la prevalenza delle condizioni a rischio cardiovascolare nella popolazione italiana di età media e lo stato del controllo di quelle modificabili.

L'indagine trasversale condotta può essere paragonata ad una *health examination survey* per le malattie cardiovascolari: dati sui fattori di rischio e malattie cardiovascolari sono stati raccolti attraverso intervista ed esame diretto della popolazione.

Sono stati identificati 51 Centri ospedalieri pubblici (Divisioni o Servizi di Cardiologia) diffusi omogeneamente sul territorio nazionale, con rapporto di uno ogni 1.5 milioni di abitanti, ma assicurandone almeno uno per le regioni con popolazione inferiore e con una certa ridondanza nelle regioni meridionali, tradizionalmente più scarse di informazioni. Ogni centro aveva la responsabilità di arruolare 200 soggetti, 25 per ogni decennio di età (35-44, 45-54, 55-64, 65-74) e sesso, scelti in modo casuale fra i residenti del comune prescelto per l'indagine. L'arruolamento è stato realizzato con lettera di invito e telefonata personale. Durante l'indagine sono state arruolate 9712 persone tra 35 e 74 anni, 4908 uomini e 4804 donne a cui si riferiscono i dati qui presentati; 1267 uomini e 1196 donne avevano età 65-74 anni; 2324 donne erano in menopausa.

### Description of the study

*In 1998 the Prevention Group of the Italian Association of Hospital Cardiologists, in collaboration with the National Health Institute, implemented The Italian Cardiovascular Epidemiological Observatory, with the aim of estimating the prevalence of atherosclerotic cardiovascular diseases, distribution of cardiovascular risk factors and prevalence of risk conditions in the Italian middle-aged population including the control status of the modifiable risk factors.*

*This cross-sectional survey can be considered a Health Examination Survey for cardiovascular diseases, collecting data on risk factors and cardiovascular disease by means of an interview and a medical examination of the population sampled.*

*Fifty-one public hospital Centers were identified, homogeneously spread throughout the country, one every 1.5 million inhabitants, guaranteeing, at any rate, at least one for each region with a lower population and a certain redundancy in the Southern regions, where traditionally data are scanty. Each Center enrolled 200 citizens, 25 per each decennial age and gender (35-44, 45-54, 55-64, 65-74) randomly selected from the registrar's office. The enrollment was carried out through a personal letter and a phone call. During the survey 9712 people aged 35-74 years were enrolled, 4908 men and 4804 women; 1267 men and 1196 women aged 65-74 years; 2324 menopausal women.*

I dati dell'inchiesta e le misure effettuate sono stati raccolti da operatori sanitari (infermieri professionali e medici) opportunamente addestrati con corsi residenziali teorico-pratici e ogni Centro, durante le operazioni sul campo, è stato sottoposto al controllo di qualità per la rilevazione delle misurazioni.

## Metodologia

**Indagine sui fattori di rischio.** Metodologie standardizzate sono state adottate nella raccolta e misurazione dei fattori di rischio.

La *pressione arteriosa* è stata misurata, prima del prelievo, da un infermiere professionale con la persona in posizione seduta, al braccio destro dopo almeno 4 minuti di riposo. È stata identificata la pressione arteriosa sistolica e diastolica, come inizio della prima e quinta fase dei toni di Korotkoff, usando lo sfigmomanometro a mercurio con appropriato bracciale. Sono state documentate due letture consecutive e nell'analisi è stata considerata la media delle due misurazioni. Le persone esaminate sono state suddivise in *borderline* e *ipertese* in base ai valori di pressione arteriosa riscontrati e al trattamento farmacologico. I *borderline* includevano quelle persone che, come media di due misurazioni successive, presentavano valori compresi fra 140 e 159 mmHg per la pressione arteriosa sistolica e tra 90 e 94 mmHg per quella diastolica; gli *ipertesi* comprendevano coloro che avevano la pressione arteriosa sistolica  $\geq 160$  mmHg o la diastolica  $\geq 95$  mmHg oppure erano sotto regolare trattamento farmacologico.

*Colesterolemia*, *colesterolemia HDL* e *trigliceridemia* sono state determinate su campioni congelati, in un unico centro, nel Servizio Universitario di Medicina di Laboratorio dell'Ospedale di Desio, utilizzando il metodo colorimetrico enzimatico (Roche Diagnostics) per il colesterolo totale e i trigliceridi e il metodo colorimetrico enzimatico omogeneo (Roche Diagnostics) per il colesterolo HDL. La *colesterolemia LDL* è stata misurata con la formula di Friedewald:

$$[\text{colesterolemia totale} - \text{colesterolemia HDL} - (\text{trigliceridemia}/5)]$$

escludendo le persone con trigliceridemia  $> 400$  mg/dl. In base ai valori della *colesterolemia*, le persone esaminate sono state suddivise in *borderline* e *ipercolesterolemiche*; i *borderline* includevano i soggetti con *colesterolemia* compresa tra 200 e 239 mg/dl, mentre nel gruppo degli *ipercolesterolemici* sono stati inclusi quelli con *colesterolemia*  $\geq 240$  mg/dl oppure sotto regolare trattamento farmacologico. Nell'analisi dei dati per l'Italia in pool sono state considerate anche le persone con *ipocolesterolemia HDL*, in particolare gli uomini con HDL  $< 40$  mg/dl e le donne con HDL  $< 50$  mg/dl; inoltre è stata valutata la prevalenza di persone con *elevati* livelli di LDL ( $\geq 115$  mg/dl) e trigliceridi ( $\geq 150$  mg/dl).

La *glicemia* è stata determinata, dopo digiuno da almeno 8 ore, con prelievo capillare su sangue intero con

*Data and measurements were collected during the survey by health personnel (nurses and doctors) trained during residential theoretical and practical courses; every Center was kept under quality control during the field work.*

## Methods

**The survey on risk factors.** Standardized methods were used in the collection and measurement of risk factors.

Blood pressure measurements were performed by a registered nurse, before blood drawing, in the sitting position after 4 minute rest, applying the appropriate cuff on the right arm. Systolic and diastolic blood pressure were identified at the beginning of the first and fifth phase of the Korotkoff sounds, using a mercury sphygmomanometer with the appropriate cuff. Two consecutive readings were recorded and their average was considered for the analysis. These subjects were divided into two categories: *borderline* and *hypertensives*, according to blood pressure values and pharmacological treatment. The first category included those persons who had a systolic blood pressure between 140 and 159 mmHg and a diastolic blood pressure between 90 and 94 mmHg. *Hypertensives* included subjects with systolic and diastolic blood pressure  $\geq 160$  or  $\geq 95$  mmHg respectively or undergoing regular antihypertensive treatment.

Total and HDL cholesterol and triglycerides were assayed after having frozen sera in a single center, at the University Laboratory of Desio Hospital, using the Roche colorimetric enzymatic method (Roche Diagnostics) for total cholesterol and triglycerides and the homogeneous colorimetric enzymatic method (Roche Diagnostics) for HDL cholesterol. LDL cholesterol was derived using the Friedewald formula:

$$[\text{total cholesterol} - \text{HDL cholesterol} - (\text{triglycerides}/5)]$$

and excluding persons with triglycerides  $> 400$  mg/dl. The people screened were divided into *borderline* and *hypercholesterolemic* subjects. *Borderline* subjects had a total cholesterol between 200 and 239 mg/dl, while those with total cholesterol  $\geq 240$  mg/dl or on regular lipid-lowering treatment were considered *hypercholesterolemic*. Subjects with *HDL cholesterol*, in particular men with HDL  $< 40$  mg/dl and women with HDL  $< 50$  mg/dl, were also considered in the pooling data analysis; moreover the prevalence of persons with high levels of LDL ( $\geq 115$  mg/dl) and triglycerides ( $\geq 150$  mg/dl) was assessed.

Blood glucose was assessed by a capillary whole blood specimen taken after a fasting of at least 8 hours,

apparecchio Reflotron Accutrend Glucose della Boehringer. Sono stati esclusi dall'analisi i soggetti con glicemia > 400 mg/dl che all'anamnesi non risultavano diabetici o con glicemia < 40 mg/dl. Sono state arbitrariamente considerate *diabetiche* le persone che al prelievo capillare presentavano una glicemia  $\geq 126$  mg/dl e quelle che al momento dell'esame erano in trattamento farmacologico per il diabete (antidiabetici orali e/o insulina). Sono stati considerati intolleranti al glucosio i soggetti con glicemia al prelievo capillare compresa tra 110 e 125 mg/dl e non in terapia farmacologica per il diabete.

Il peso e l'altezza sono stati misurati con il soggetto in abiti leggeri; per l'altezza è stato utilizzato lo stammetro a muro, per il peso la bilancia da terra; i dati sono stati compattati nell'*indice di massa corporea* (peso in kg diviso altezza in m<sup>2</sup>). In questa analisi l'indice di massa corporea è stato utilizzato per la valutazione del sovrappeso e dell'obesità: sono state considerate in *sovrappeso* le persone con un indice di massa corporea compreso fra 25 e 29 kg/m<sup>2</sup> e *obese* tutte quelle con indice di massa corporea  $\geq 30$  kg/m<sup>2</sup>.

La *circonferenza della vita* è stata misurata, con il soggetto in piedi, utilizzando un metro da sarto, a metà tra il bordo inferiore dell'arcata costale ed il margine superiore della cresta iliaca, in fase espiratoria. La *circonferenza dei fianchi* è stata misurata all'altezza delle spine iliache anteriori e superiori indipendentemente da forma e posizione delle natiche. La misura delle circonferenze è stata riportata in centimetri con un decimale (0 o 5). Il *rapporto vita/fianchi* è stato calcolato rapportando le due misure. Recentemente le linee guida americane<sup>1</sup> ed europee<sup>2</sup> hanno classificato come *adiposità addominale* una circonferenza della vita > 102 cm negli uomini e > 88 cm nelle donne; l'*adiposità addominale* è una delle caratteristiche che possono configurare la sindrome metabolica. Va qui ricordato che anche un rapporto vita/fianchi > 0.95 negli uomini e > 0.85 nelle donne è considerato indice di adiposità addominale<sup>3</sup>.

L'abitudine al fumo di sigaretta, l'attività fisica, l'uso regolare di terapie farmacologiche sono stati raccolti attraverso un questionario standardizzato. L'*abitudine al fumo di sigaretta* riguardava il consumo abituale di sigarette al giorno al momento dell'intervista, e per gli ex fumatori il consumo in passato. I dati qui presentati si riferiscono alla frequenza di fumatori regolari, cioè di coloro che fumano una o più sigarette al giorno, ed al numero medio di sigarette al giorno per fumatore. È anche riportata la prevalenza degli ex fumatori.

Il *livello dell'attività fisica*, rilevato secondo il questionario già utilizzato nell'ambito del Progetto CNR ATS-RF2<sup>4</sup>, è stato espresso in 4 categorie di ordine crescente (sedentaria, leggera, moderata, pesante), separatamente per l'attività fisica lavorativa e nel tempo libero; ogni soggetto doveva indicare in quale categoria meglio si identificava. Per questa analisi l'attività fisica è stata trasformata in sedentaria e non sedentaria, que-

*with the Boehringer Reflotron Accutrend Glucose device. For this analysis, subjects with blood glucose > 400 mg/dl if nondiabetics and those with blood glucose < 40 mg/dl were excluded. Arbitrarily subjects with blood glucose  $\geq 126$  mg/dl or on antidiabetic treatment (oral hypoglycemic medication and/or insulin) at the time of the screening were considered diabetics. Subjects with blood glucose between 110 and 125 mg/dl and without antidiabetic drug treatment were considered at impaired glucose tolerance.*

*Weight and height were measured in underwear; a wall height ruler and a standard electronic scale with digital display were used respectively for height and weight; data were computed in body mass index (weight in kg divided by height in m<sup>2</sup>). In this analysis the body mass index was used to define overweight and obesity. Persons with a body mass index between 25 and 29 kg/m<sup>2</sup> were considered overweight, while those with a body mass index  $\geq 30$  kg/m<sup>2</sup> were considered obese.*

*Hips and waist were measured with a tapeline, the subject in standing position. The waist was measured at medium point between lower edge of costal arch and upper edge of iliac crest, while exhaling. Hips were measured at front and upper iliac spines independently of the position or shape of buttocks. Measures were reported in centimeters with a decimal (0 or 5). American<sup>1</sup> and European<sup>2</sup> guidelines reported abdominal obesity as a waist > 102 cm in men and > 88 cm in women. Abdominal obesity is one of the conditions that may lead to a metabolic syndrome. A waist to hip ratio > 0.95 in men and > 0.85 in women is considered an index of abdominal obesity<sup>3</sup>.*

*Smoking habit and physical activity and the regular use of medical therapy were investigated through a standardized questionnaire. Smoking questionnaire included current, former and never smokers. Smoking habit was considered if the subject smoked one or more cigarettes a day. Cigarette consumption for current and former smokers was recorded. In the Results section the number of cigarettes smoked per day in smokers is shown.*

*Physical activity was collected through a questionnaire including 4 levels of exercise (sedentary, mild, moderate, heavy) separately for work and leisure time. The questionnaire has already been used in an Italian research sponsored by the National Research Council<sup>4</sup>. Respondents indicated the most suitable category for their activities. In this analysis physical activity was considered only as sedentary and nonsedentary, merg-*

st'ultima comprendente le categorie moderata, pesante e molto pesante.

Le *terapie farmacologiche* riguardavano trattamenti antipertensivi, ipocolesterolemizzanti, antidiabetici, uso di aspirina a scopo preventivo, terapia anticoncezionale o ormonale sostitutiva in menopausa.

**Prevalenza delle malattie cardiovascolari, della sindrome metabolica e della familiarità.** La presenza di *angina pectoris* e *claudicatio intermittens* è stata valutata attraverso la positività ai questionari specifici della London School of Hygiene and Tropical Medicine (LSHTM)<sup>5</sup> oppure alla storia di intervento di bypass o angioplastica.

La prevalenza di *vecchio infarto* è stata valutata attraverso il questionario della LSHTM, che include, oltre ai sintomi, la storia documentata di un ricovero ospedaliero, nonché la presenza di alcune alterazioni ECG stabilite con la lettura secondo il Codice Minnesota<sup>5</sup>, in particolare sono stati considerati i codici relativi alla presenza di onda Q e QS (argomento 1), presenza di onda T negativa (argomento 5) e disturbi del ritmo (argomento 6, 7 e 8.3)<sup>6</sup>.

La presenza di *fibrillazione atriale* è stata diagnosticata tramite la lettura dell'ECG secondo il Codice Minnesota (argomento 8.3).

La prevalenza di *eventi cerebrovascolari* è stata valutata attraverso il questionario specifico della LSHTM e la documentazione clinica del ricovero ospedaliero.

L'*ipertrofia ventricolare sinistra* è stata valutata attraverso l'ECG letto secondo il Codice Minnesota (argomento 3.1).

La *frequenza cardiaca* è stata calcolata nell'ECG, come media di battiti al minuto fra la derivazione I e V<sub>6</sub>.

La *sindrome metabolica*, conosciuta anche come sindrome da insulino-resistenza, è caratterizzata da un'aggregazione di iperinsulinemia e altri fattori di rischio che includono un'alterata regolazione della glicemia, elevati trigliceridi, ridotto HDL, elevata pressione arteriosa ed obesità addominale. Per l'uso nella pratica clinica, la sindrome metabolica è stata recentemente definita dalle linee guida americane<sup>2</sup> ed europee<sup>7</sup> come la presenza, nello stesso soggetto di tre o più delle seguenti componenti:

- obesità centrale (circonferenza della vita > 102 cm negli uomini e > 88 cm nelle donne);
- alterata regolazione della glicemia (glicemia a digiuno ≥ 110 mg/dl o 6.1 mmol/l);
- trigliceridi elevati (≥ 150 mg/dl o 1.7 mmol/l);
- basso HDL (< 40 mg/dl o 1.0 mmol/l negli uomini; < 50 mg/dl o 1.3 mmol/l nelle donne);
- pressione arteriosa elevata (≥ 130/85 mmHg).

La *familiarità* per malattie cardiovascolari aterosclerotiche, per ipertensione, dislipidemie e diabete è stata indagata con domande riguardanti i familiari consanguinei di primo grado, considerando ictus e infarto del miocardio di un parente di primo grado ammalato o deceduto in età < 55 anni negli uomini e < 65 anni nelle donne.

*ing the mild, moderate and heavy categories in the latter.*

Pharmacological treatments considered the use of antihypertensive, hypolipidemic and antidiabetic drugs, the aspirin use for prevention, oral contraceptives, hormone replacement therapy.

**Prevalence of cardiovascular diseases, metabolic syndrome, and family history.** The presence of *angina pectoris* and *claudicatio intermittens* was assessed with specific questionnaires developed by the London School of Hygiene and Tropical Medicine (LSHTM)<sup>5</sup> or by a history of a coronary artery bypass graft or coronary angioplasty.

The prevalence of old myocardial infarctions was evaluated with the LSHTM questionnaire, including symptoms, hospital records and presence of specific ECG items according to the Minnesota Code<sup>5</sup>, in particular, presence of Q and QS waves (item 1), negative T wave (item 5) and dysrhythmias (items 6, 7 and 8.3)<sup>6</sup>.

The prevalence of atrial fibrillation was assessed according to the Minnesota Code (item 8.3).

The prevalence of strokes was evaluated according to the LSHTM questionnaire and a review of hospital records.

Left ventricular hypertrophy was assessed according to the Minnesota Code (item 3.1).

Heart rate was calculated as the average of heart beats per minute between leads I and V<sub>6</sub>.

The metabolic syndrome, also known as insulin-resistance syndrome, is characterized by an aggregation of hyperinsulin associated with an altered regulation of glycemia, high triglycerides, low HDL, high blood pressure, and abdominal obesity. In clinical practice, the metabolic syndrome has been recently defined by the American<sup>2</sup> and European<sup>7</sup> guidelines as the presence, in the same subject, of three or more of the following components:

- central obesity (waist > 102 cm in men and > 88 cm in women);
- altered glycemia regulation (after fasting ≥ 110 mg/dl or 6.1 mmol/l);
- high triglycerides (≥ 150 mg/dl or 1.7 mmol/l);
- low HDL (< 40 mg/dl or 1.0 mmol/l in men; < 50 mg/dl or 1.3 mmol/l in women);
- high blood pressure (≥ 130/85 mmHg).

Family history for atherosclerotic cardiovascular diseases, hypertension, hyperlipidemia, and diabetes was assessed with questions regarding first-degree blood relatives, considering only men < 55 years and women < 65 years who died from or had a stroke or myocardial infarction.

## Presentazione dei risultati

I dati raccolti vengono presentati come medie e deviazioni standard per le variabili continue e come frequenze percentuali per quelle categoriche; sono standardizzati per età, considerando come riferimento la popolazione italiana residente al 1994, pertanto sono confrontabili a livello territoriale.

Per quanto riguarda la distribuzione geografica sono state considerate l'Italia intera e le seguenti macroaree: *Nord-Ovest*, inclusiva dei dati raccolti nei centri del Piemonte, Val d'Aosta, Lombardia, Liguria; *Nord-Est*, inclusiva dei dati raccolti nei centri del Trentino Alto Adige, Veneto, Friuli-Venezia Giulia, Emilia Romagna; *Centro*, inclusiva dei dati raccolti nei centri della Toscana, Umbria, Marche, Lazio; *Sud e Isole*, inclusiva dei dati raccolti nei centri dell'Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicilia, Sardegna.

Vengono presentati i dati relativi alle caratteristiche demografiche del campione di popolazione esaminato, al titolo di studio e allo stato civile, i principali fattori di rischio cardiovascolare, la prevalenza delle principali condizioni a rischio, la prevalenza delle malattie cardiovascolari e della familiarità per malattie cardiovascolari e per ipertensione, dislipidemia e diabete.

Una descrizione a parte per i fattori di rischio e la prevalenza delle malattie è stata fatta per le persone di età 65-74 anni e per le donne in menopausa. I dati relativi alle donne in menopausa sono standardizzati per età; l'età media della donna in menopausa è risultata di 62 anni; l'età media alla menopausa è risultata di 50 anni.

## Commento

In questa II edizione dell'Atlante sono presentati, per l'intera popolazione esaminata, dati integrativi a quelli descritti nella I edizione; vengono inoltre presentati per la prima volta i dati riferiti a due gruppi di popolazione particolarmente gravati dal carico delle malattie cardiovascolari e dei loro fattori di rischio, gli anziani, da noi definiti dai 65 ai 74 anni, e le donne in menopausa.

In generale, l'elevata prevalenza di obesità, associata ad una contemporanea elevata prevalenza di inattività fisica confermano lo sbilanciamento tra le calorie introdotte con l'alimentazione e la diminuzione delle calorie disperse attraverso un'attività fisica regolare, conseguenti a cambiamenti delle abitudini di vita avvenuti negli ultimi decenni. I valori riscontrati indicano che ancora molto si può fare migliorando l'azione sugli stili di vita, in particolare promuovendo azioni sull'aumento dell'attività fisica, e su una sana alimentazione, caratterizzata dall'ampia varietà di cibi di origine animale e vegetale, con limitato consumo di sale, basso consumo di grassi, specialmente di origine animale,

## Results

*Data displayed are shown as mean values and standard deviations for continuous variables and as percent for categorical variables; age-standardized according to the Italian population in 1994.*

*About the geographic distribution Italy was considered as a whole and the following macroareas (i.e. area comprising more Regions, generally contiguous): Northwest, including data from Piedmont, Aosta Valley, Lombardy, Liguria; Northeast, including data from Trentino Alto Adige, Veneto, Friuli-Venezia Giulia, Emilia Romagna; Center, including data from Tuscany, Umbria, Marche, Latium; South and Islands, including data from Abruzzo, Molise, Campania, Apulia, Basilicata, Calabria, Sicily, Sardinia.*

*Demographic characteristics, educational level, marital status, major cardiovascular risk factors, prevalence of high-risk conditions, prevalence of cardiovascular diseases, family history for cardiovascular disease, hypertension, hypercholesterolemia and diabetes are presented.*

*In addition, data on menopausal women and older persons 65-74 years are reported separately. Data related to menopausal women are age-standardized; the mean age of menopausal women was 62 years; the mean age at menopause was 50 years.*

## Comments

*The 2nd edition of this Atlas completes the first one with new data on the risk factor distribution and the prevalence of high-risk conditions in the population sampled. Data on the older population aged 65-74 years and on menopausal women, particularly exposed to cardiovascular diseases and risk factors, are presented for the first time here.*

*Generally, the high prevalence of obesity, together with a high prevalence of physical inactivity confirm the imbalance between dietary caloric intake and energy spent with regular exercise, which are due to lifestyle changes occurred in the last decades. Our results demonstrate the potential to improve preventive lifestyles at the community level, particularly promoting physical activity and a healthy diet, based on a great variety of food (animal and vegetable), a limited consumption of salt, a low consumption of fats, especially from animal origin, and an increase in fibers, starch, vitamins and minerals contained in fruits, vegetables, pulses, cereals and fish. These lifestyles can be*

con aumento del consumo di cibi ricchi di fibre, amido, vitamine e minerali, contenuti nella frutta, verdura, legumi e cereali, e di pesce a qualsiasi età. Molto è stato fatto in questi ultimi anni sull'abolizione del fumo, ma l'azione deve essere continuativa.

Notevoli differenze si riscontrano nelle macroaree per ipertensione, obesità e inattività fisica, indicando che alcune aree geografiche necessitano di maggior attenzione verso la correzione di stili di vita. La diversa prevalenza delle condizioni a rischio nelle macroaree del paese deve far riflettere e suggerire che è possibile avere come obiettivo il raggiungimento dei livelli medi dei fattori delle aree a minor rischio.

È indubbio che gli abitanti delle aree geografiche dell'Italia tipicamente "mediterranea" appaiono più a rischio rispetto a quelli che abitano le altre aree del Paese. L'elevata proporzione di persone ipertese, la frequenza del diabete, l'elevata prevalenza di fumatori sono problemi che vanno affrontati implementando le misure di prevenzione primaria.

Interventi rivolti a semplici modificazioni degli stili di vita nelle diverse età, anche in quella avanzata, consentiranno di mantenere nel tempo l'attuale guadagno di aspettativa di vita (siamo fra i paesi in cui è più alta) in buone condizioni di salute così come idonee strategie di prevenzione potranno contribuire sia a ridurre i tassi di ospedalizzazione che i costi di cura e riabilitazione. Laddove i fattori di rischio modificabili sono particolarmente elevati o anche poco elevati singolarmente, ma alterati insieme, si configura un elevato rischio cardiovascolare globale (vedi ultima sezione dell'Atlante) per il quale, oltre agli stili di vita "salvacuore" che diventano imperativi, esistono farmaci, in particolare antipertensivi ed ipolipemizzanti, di documentata efficacia preventiva, ben tollerati, ottimamente valutati nelle linee guida a cui si rimanda<sup>2,7</sup>.

*adopted at any age. During these last years many actions were implemented against smoking habit, but they should be continued.*

*There are remarkable differences among macroareas of the country with regard to hypertension, obesity and physical inactivity, indicating that greater attention should be paid to lifestyle correction in some of them. The different prevalences of high-risk conditions in the various parts of the country have important public health implications as they suggest that a feasible target is to achieve the mean risk levels of low-risk areas also in the high-risk ones.*

*People living in the typical "Mediterranean" areas are at higher risk compared to those living in other areas of the country. The high proportion of hypertensives, the frequency of diabetes, the high prevalence of smokers are issues that should be contrasted implementing primary prevention actions.*

*Interventions aimed at simple lifestyle improvements in different age groups, included advanced age, will allow to keep the actual gain of life expectancy over time (we are among the countries with the highest life expectancy) in good health. At the same time proper prevention strategies may reduce hospitalization rates and expenditure related to health care and rehabilitation. When the modifiable risk factors are particularly high or when they are singly modestly elevated but altered in combination, an elevated global cardiovascular risk is present (see last section of the Atlas). In this case, besides the healthy lifestyles, which are mandatory, there are drugs with an evidence-based preventive action, such as antihypertensive and lipid-lowering ones, well tolerated and properly addressed in the guidelines<sup>2,7</sup>.*

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## Numerosità dei partecipanti per sesso e classe di età

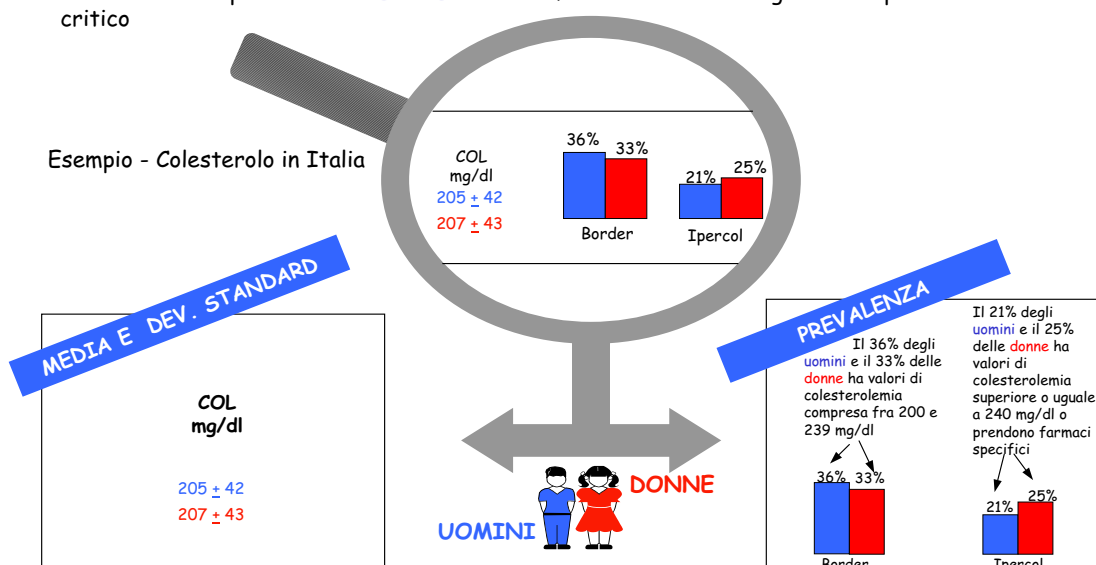
		UOMINI	DONNE	TOTALE
Italia	35 - 44 anni	1147	1141	2288
	45 - 54 anni	1218	1232	2450
	55 - 64 anni	1276	1235	2511
	65 - 74 anni	1267	1196	2463
	<b>Totale</b>	<b>4908</b>	<b>4804</b>	<b>9712</b>
Nord-Ovest	35 - 44 anni	294	290	584
	45 - 54 anni	314	326	640
	55 - 64 anni	331	343	674
	65 - 74 anni	329	322	651
	<b>Totale</b>	<b>1268</b>	<b>1281</b>	<b>2549</b>
Nord-Est	35 - 44 anni	227	238	465
	45 - 54 anni	234	244	478
	55 - 64 anni	243	243	486
	65 - 74 anni	245	232	477
	<b>Totale</b>	<b>949</b>	<b>957</b>	<b>1906</b>
Centro	35 - 44 anni	222	211	433
	45 - 54 anni	230	239	469
	55 - 64 anni	241	241	482
	65 - 74 anni	242	232	474
	<b>Totale</b>	<b>935</b>	<b>923</b>	<b>1858</b>
Sud e Isole	35 - 44 anni	404	402	806
	45 - 54 anni	440	423	863
	55 - 64 anni	461	408	869
	65 - 74 anni	451	410	861
	<b>Totale</b>	<b>1756</b>	<b>1643</b>	<b>3399</b>

Sample size. Men and women by decennial of age, total, Northwest, Northeast, Center, South and Islands.

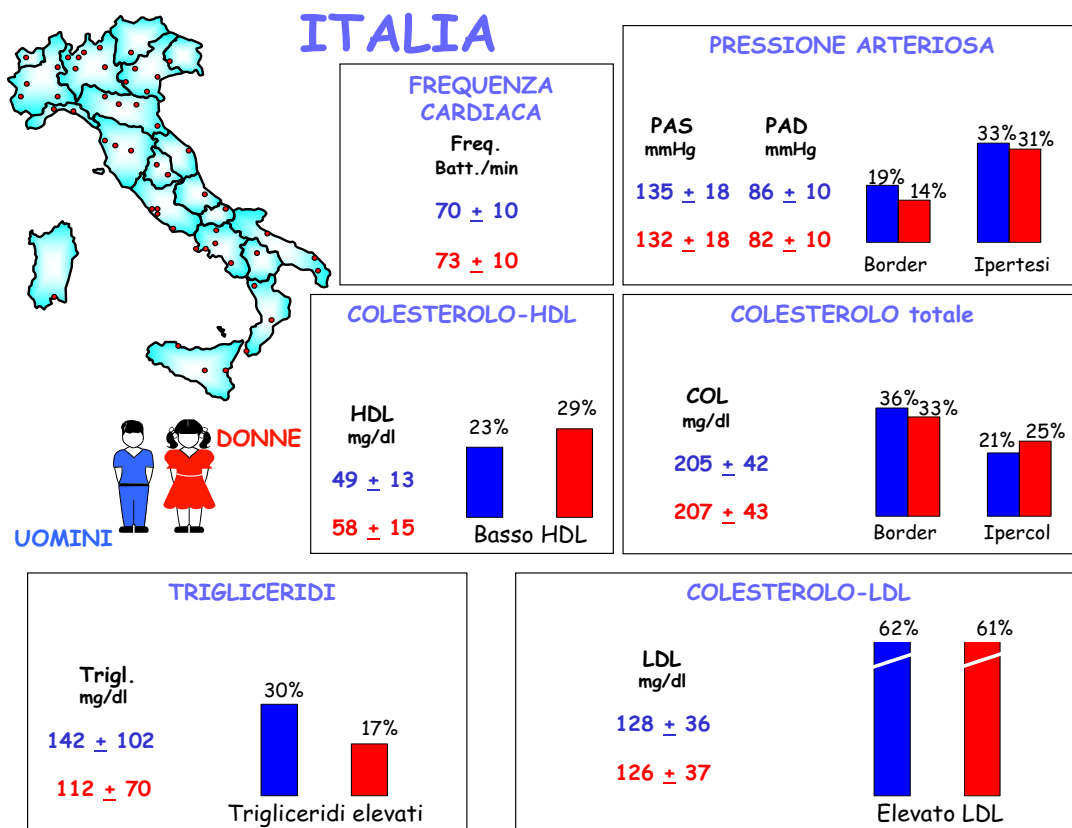
## COME LEGGERE I GRAFICI

I fattori di rischio vengono descritti seguendo due modalità:

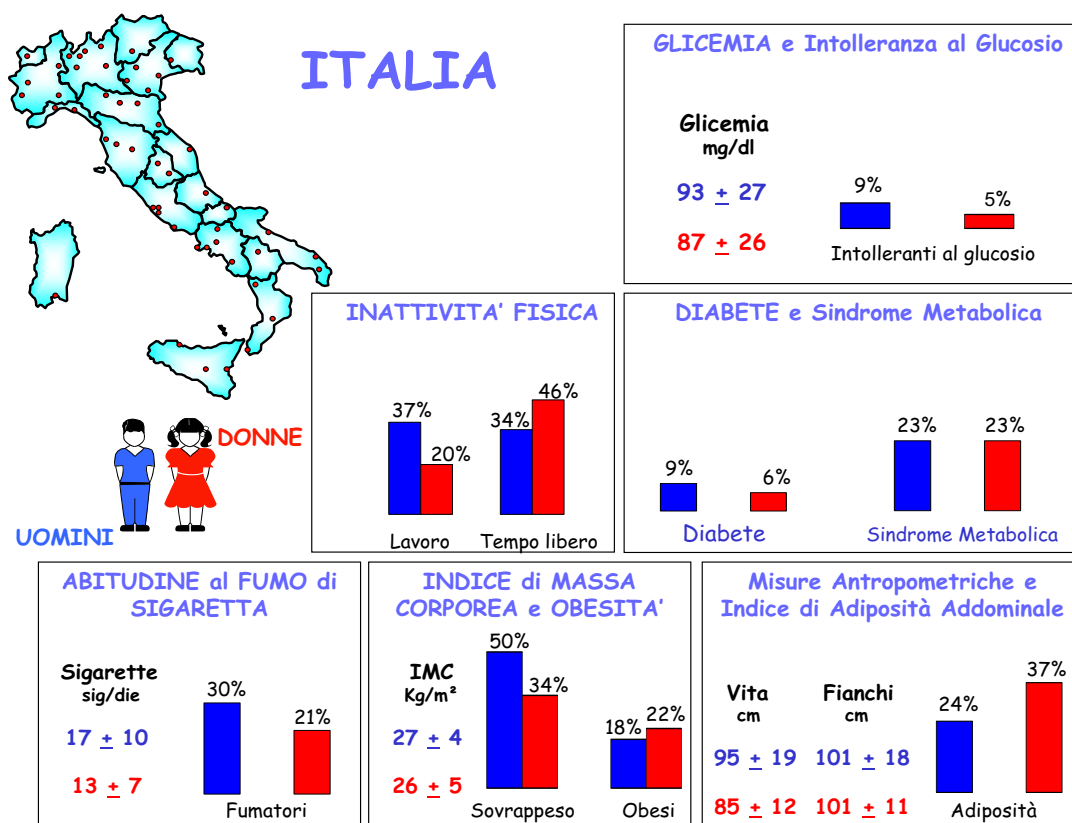
- > a sinistra sono indicati la **MEDIA** e la **DEVIAZIONE STANDARD**
- > a destra è riportata la **PREVALENZA** del fattore di rischio uguale o superiore al livello critico



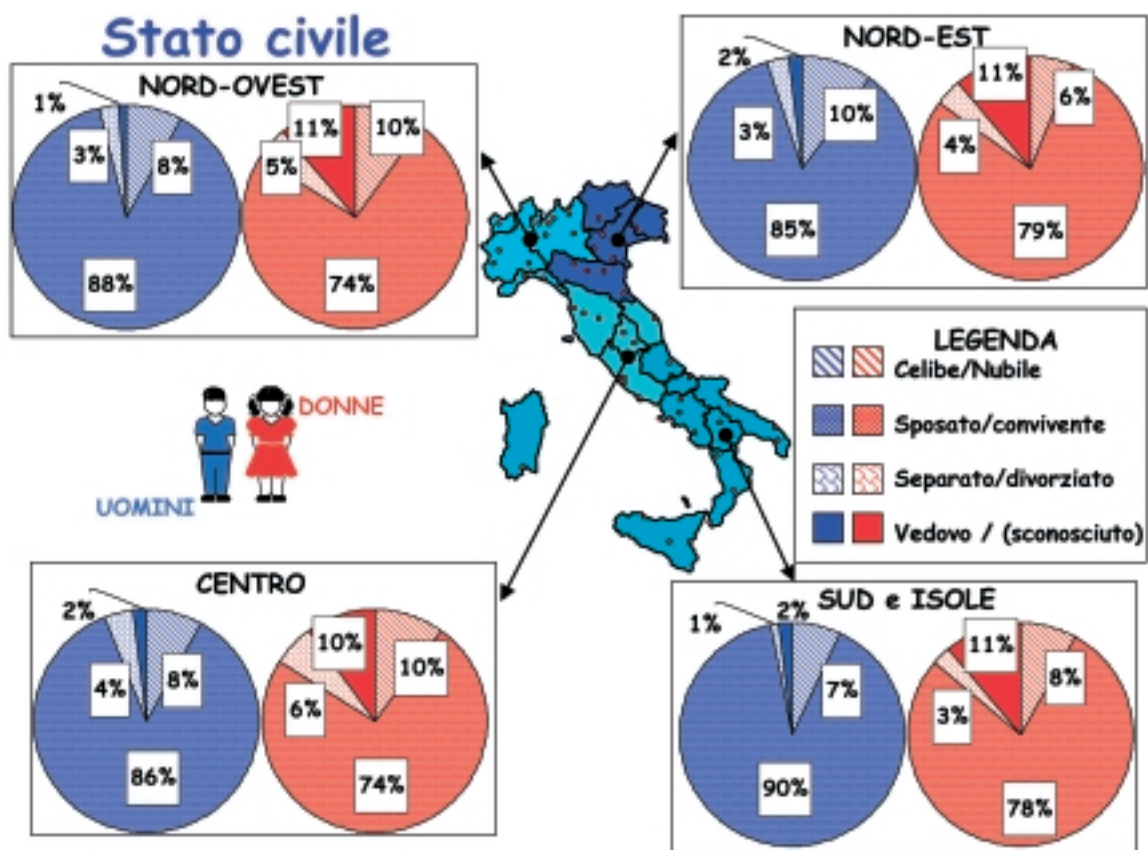
How to read the graphs. Risk factors are displayed in two ways: on the left mean values and standard deviations are reported; on the right percent prevalences are shown. Men in blue, women in red.



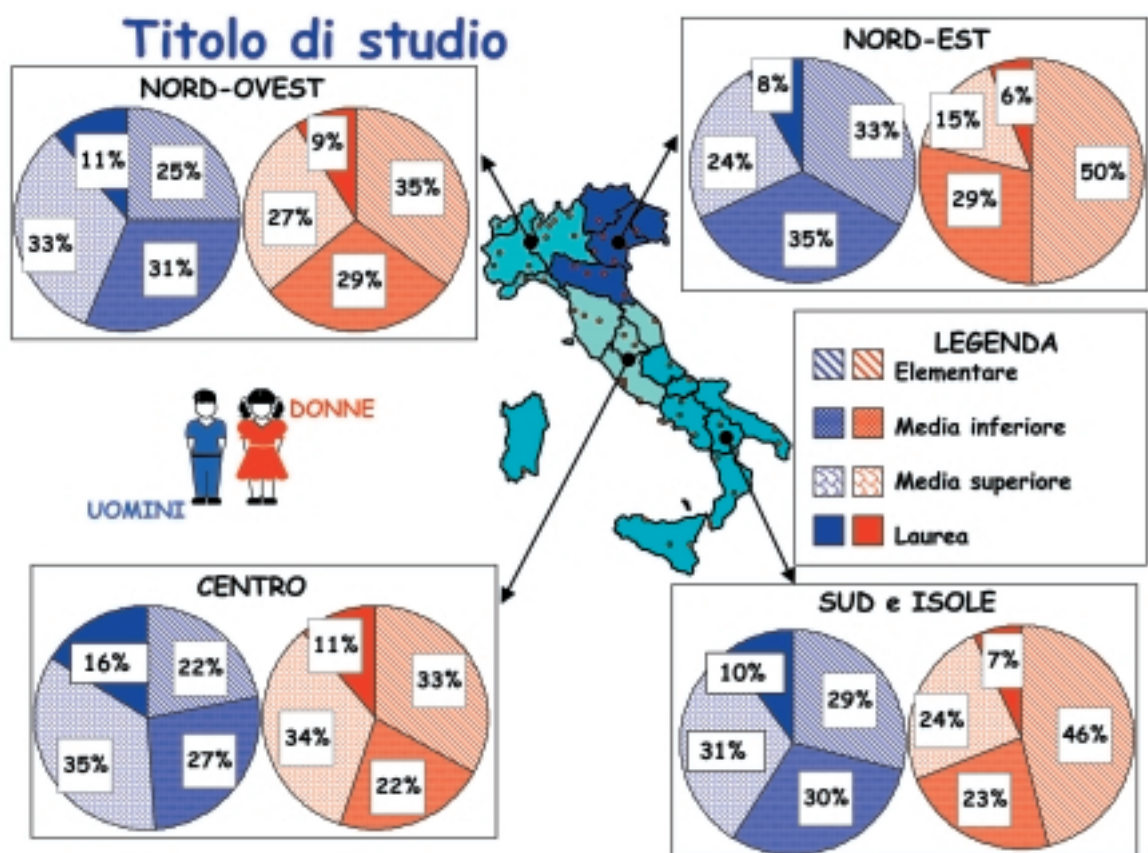
Italy. Mean levels of risk factors: heart rate, blood pressure, total, LDL and HDL cholesterol, triglycerides; prevalence of high-risk conditions: borderline and hypertensives, borderline and hypercholesterolemia, high triglycerides, high LDL and low HDL cholesterol. Men and women.



Italy. Mean levels of risk factors: fasting blood glucose, number of cigarettes smoked per day, waist, hip; prevalence of high-risk conditions: physical inactivity, diabetes and metabolic syndrome, smoking habit, body mass index and obesity, and adiposity index. Men and women.

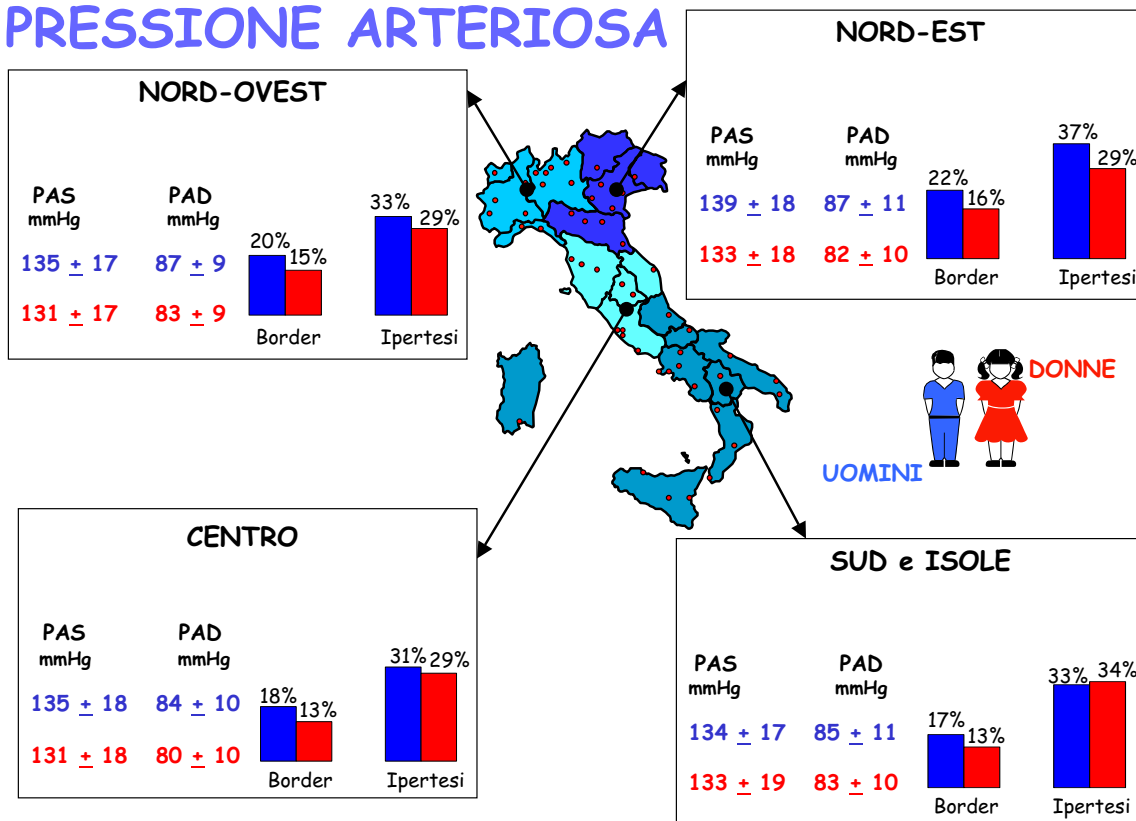


Marital status by geographic areas in men and women: single, married, divorced, widow.



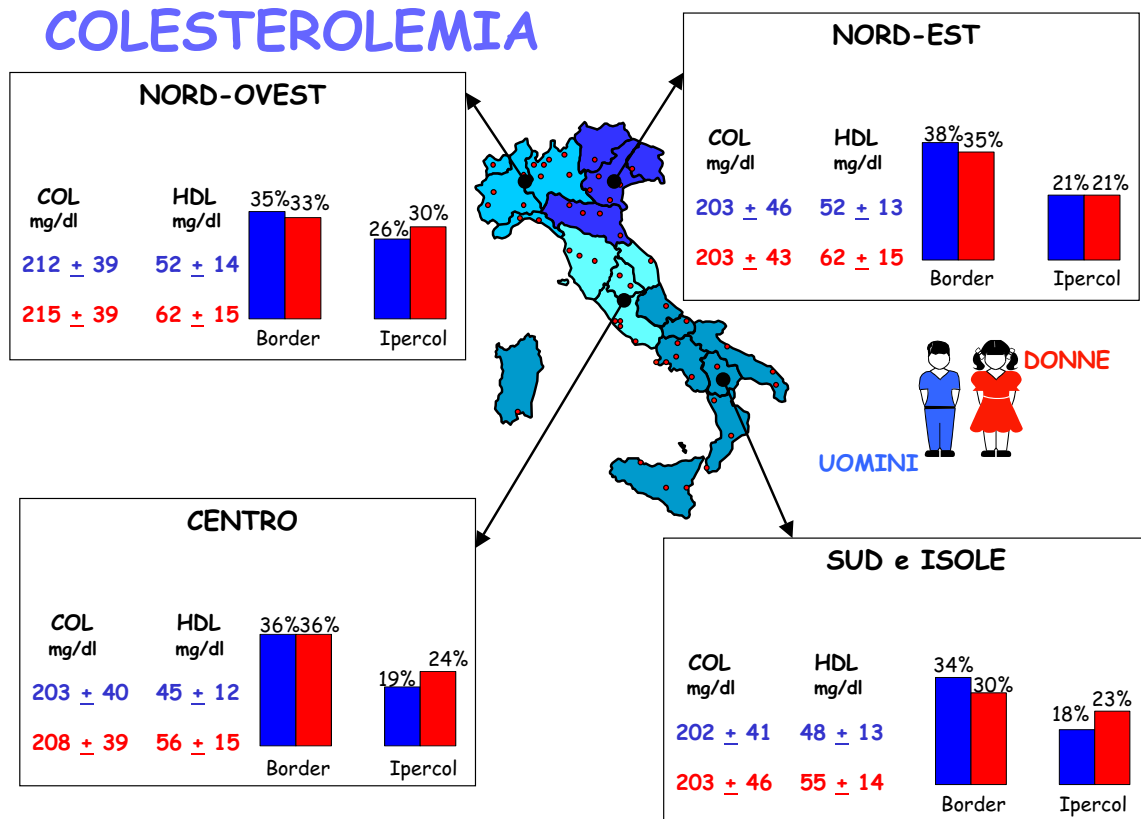
Education by geographic areas in men and women: primary, secondary, high school, university.

# PRESSIONE ARTERIOSA



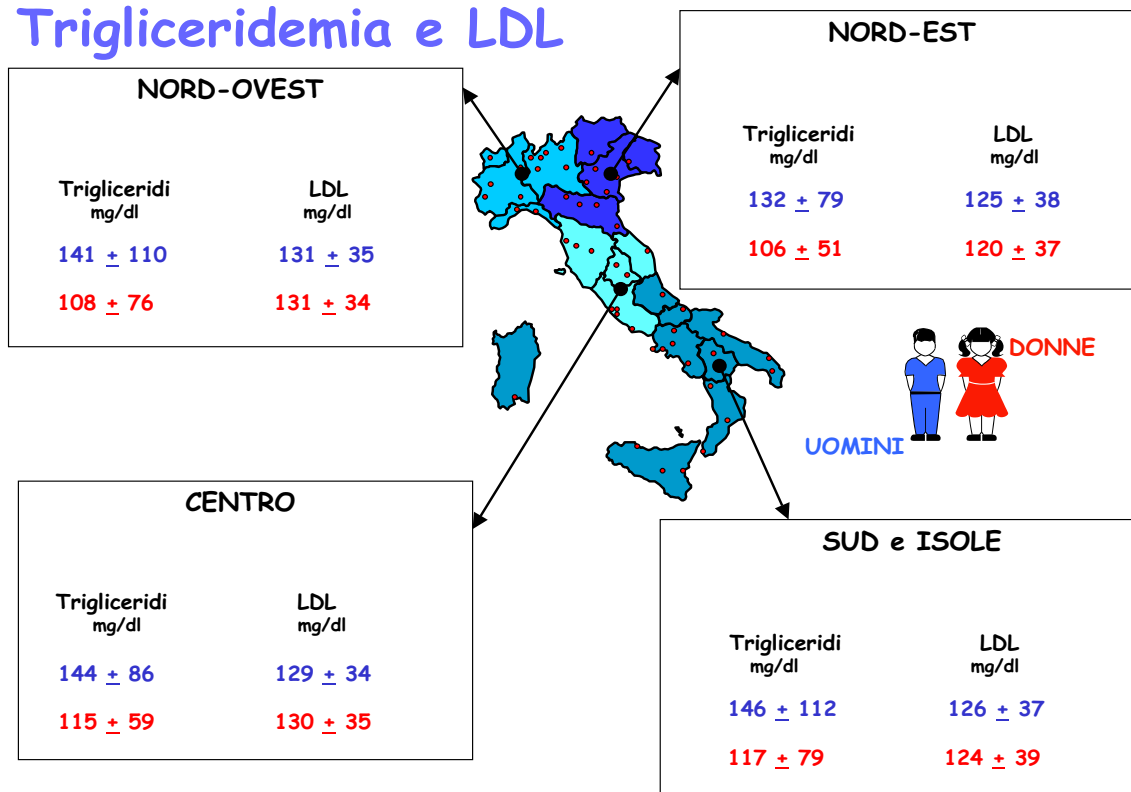
Mean levels of blood pressure and prevalence of hypertension in Italian macroareas. Men and women.

# COLESTEROLEMIA



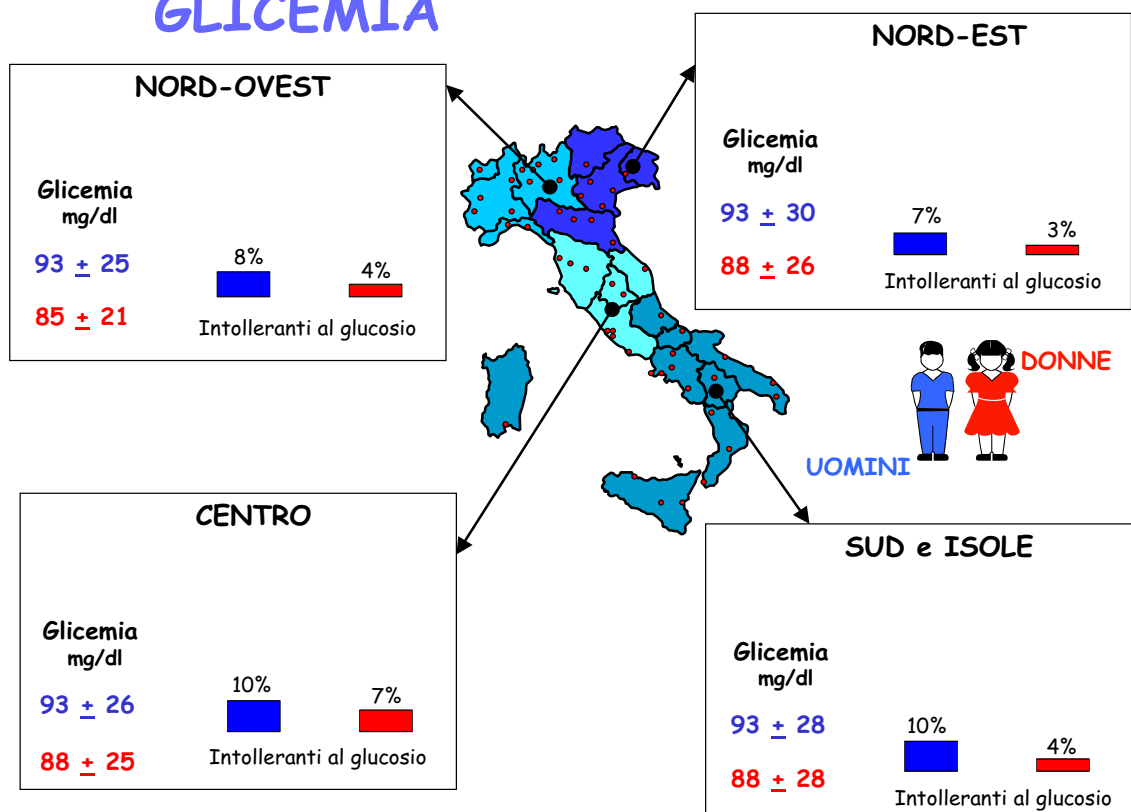
Mean levels of total and HDL cholesterol and prevalence of hypercholesterolemia in Italian macroareas. Men and women.

## Trigliceridemia e LDL



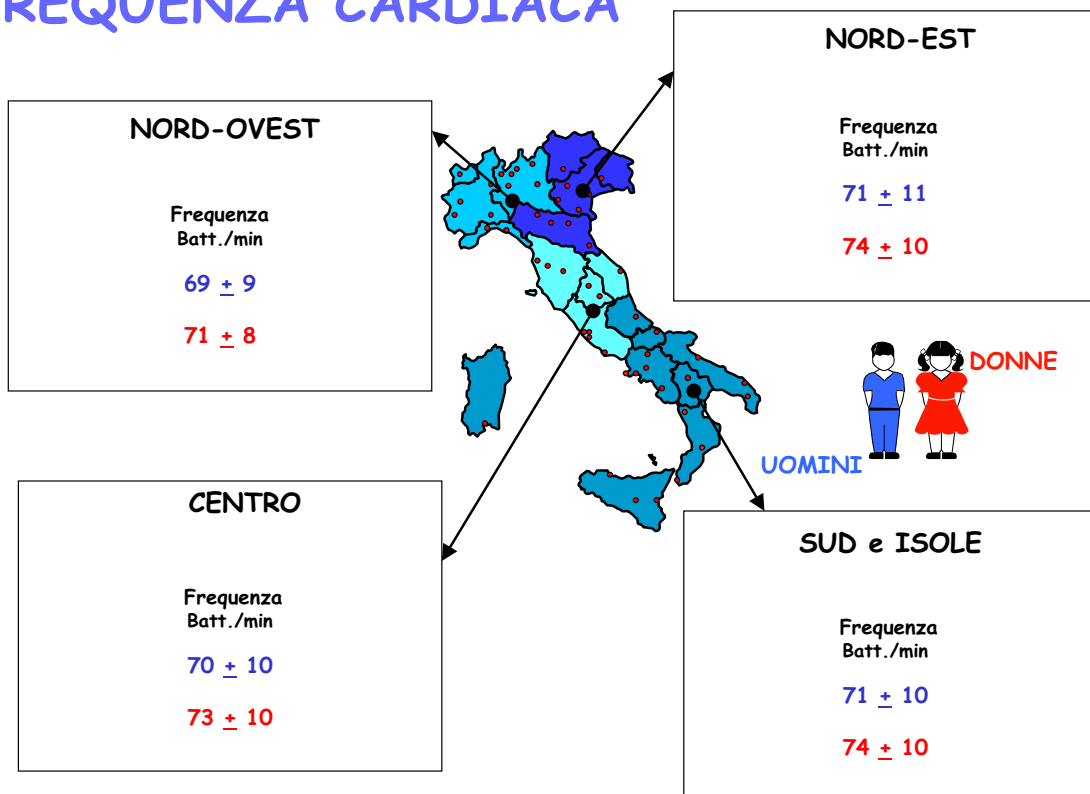
Mean levels of triglycerides and LDL cholesterol in Italian macroareas. Men and women.

## GLICEMIA



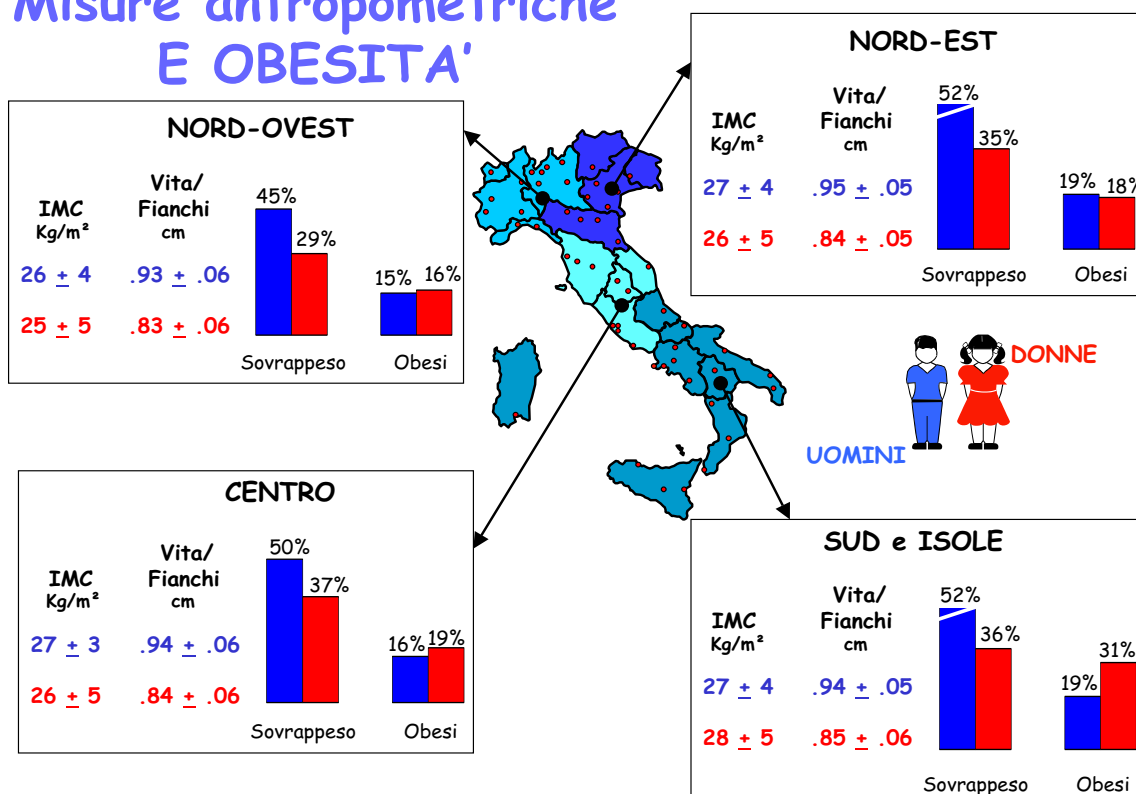
Mean levels of fasting blood glucose and prevalence of impaired glucose tolerance in Italian macroareas. Men and women.

## FREQUENZA CARDIACA



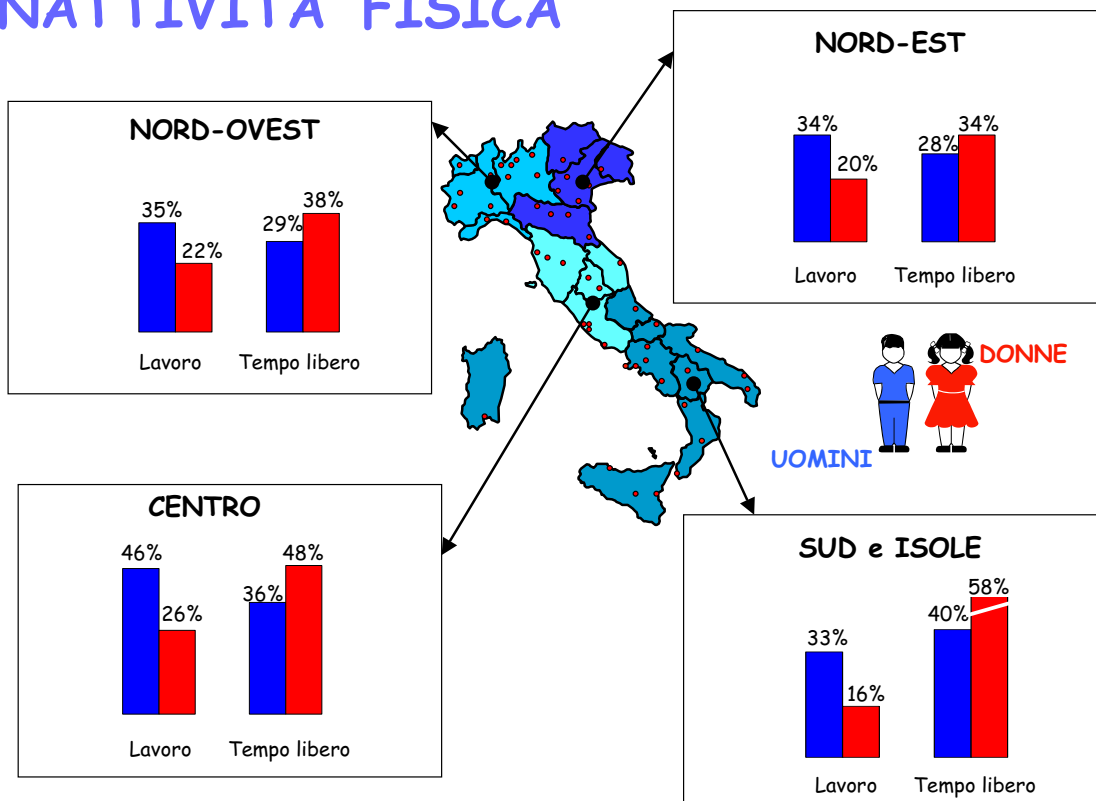
Mean levels of heart rate in Italian macroareas. Men and women.

## Misure antropometriche E OBESITA'



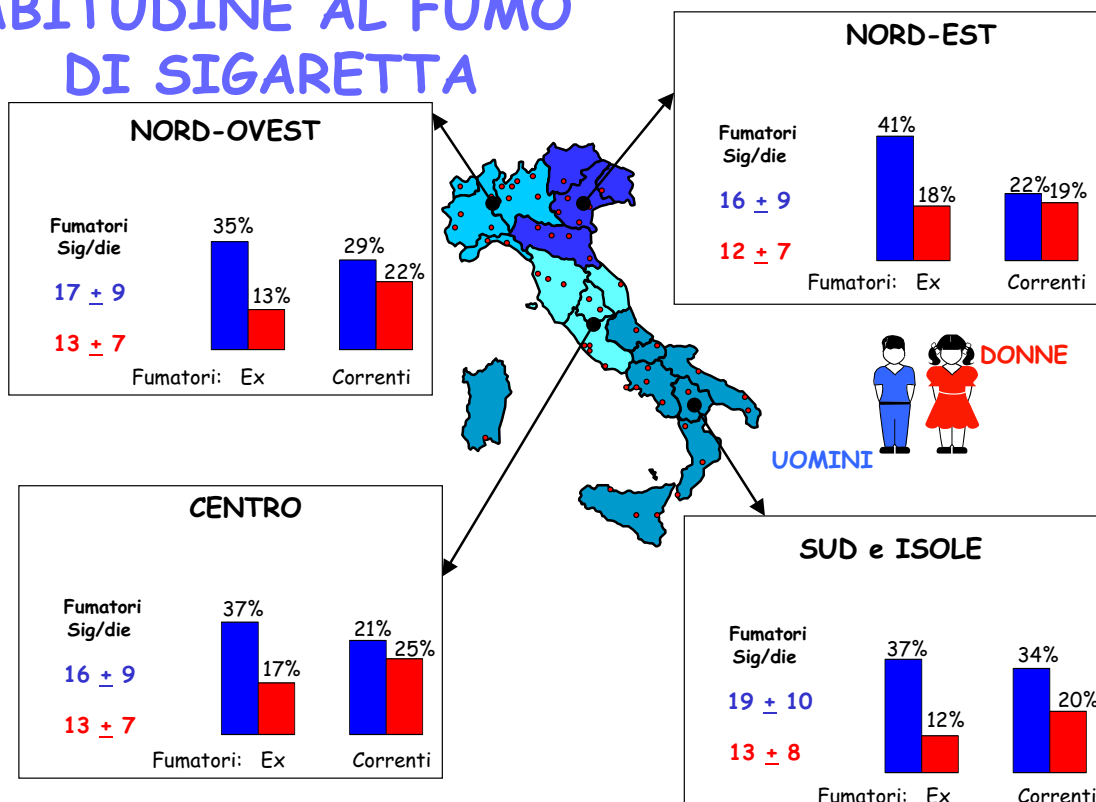
Mean levels of body mass index and prevalence of overweight and obesity in Italian macroareas. Men and women.

## INATTIVITA' FISICA



Prevalence of physical inactivity at work and leisure time in Italian macroareas. Men and women.

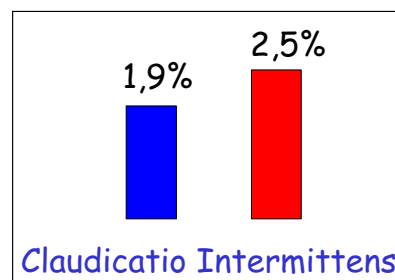
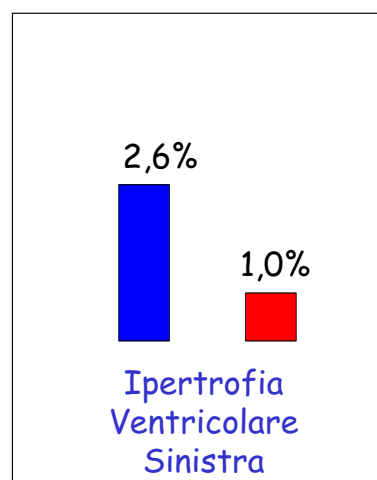
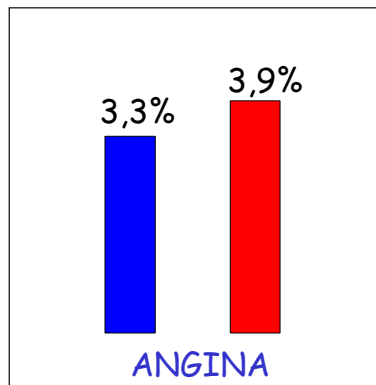
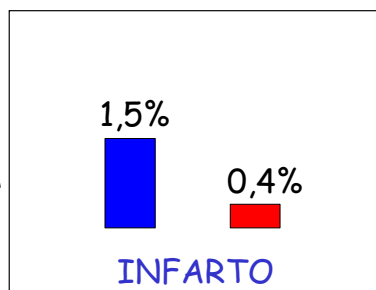
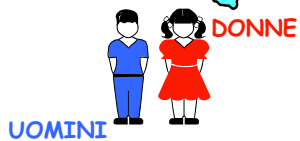
## ABITUDINE AL FUMO DI SIGARETTA



Prevalence of smoking habit and mean number of cigarettes smoked per day in smokers in Italian macroareas. Men and women.



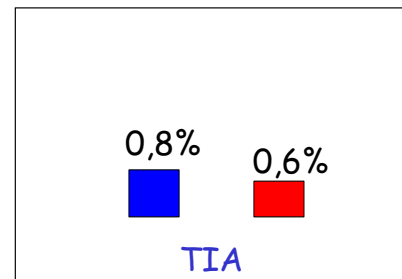
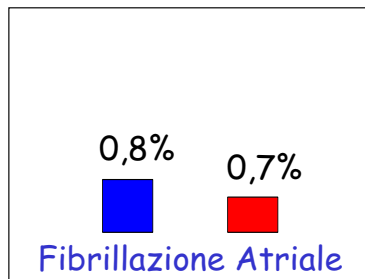
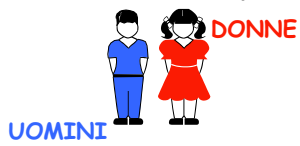
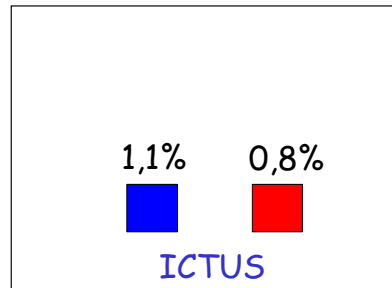
# ITALIA



Italy. Prevalence of cardiovascular diseases: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women.



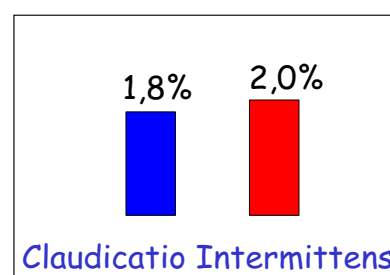
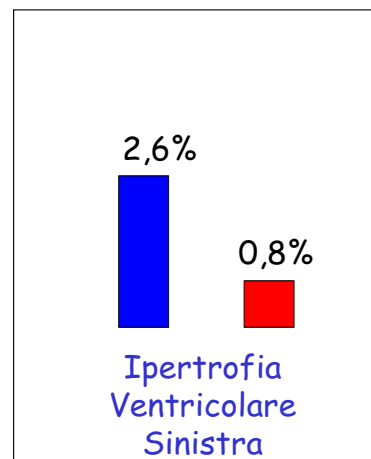
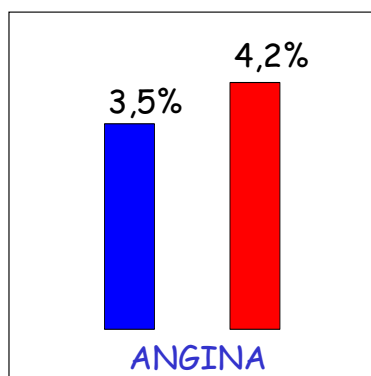
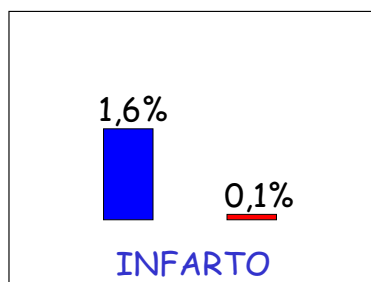
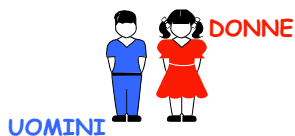
# ITALIA



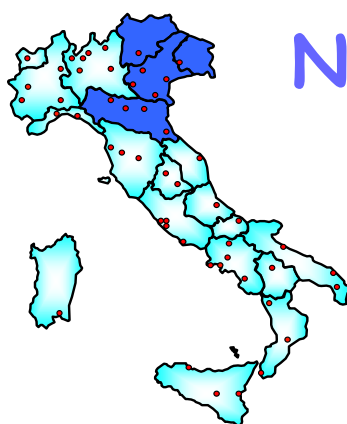
Italy. Prevalence of cardiovascular diseases: stroke, TIA, atrial fibrillation. Men and women.



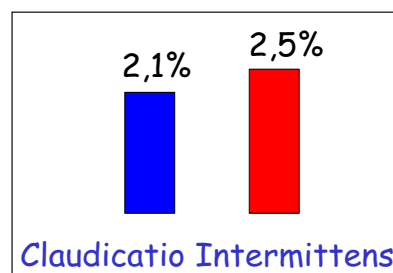
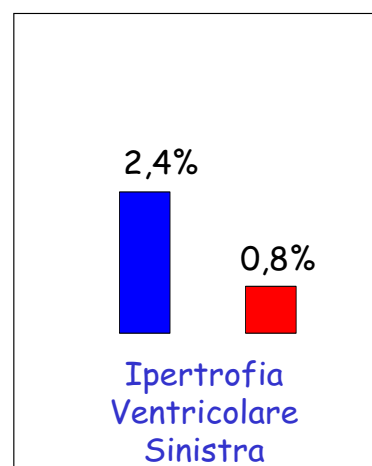
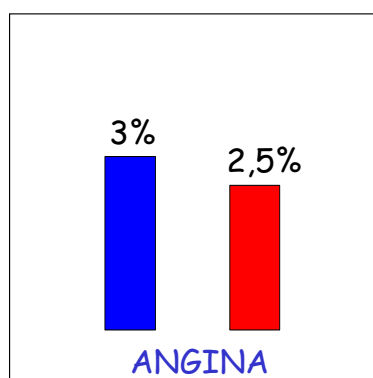
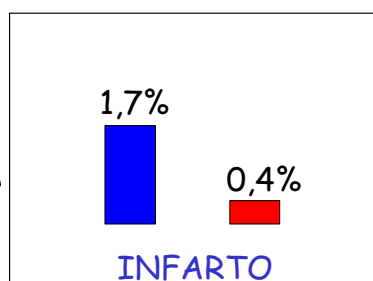
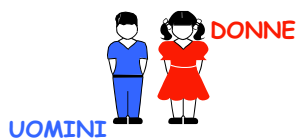
## NORD-OVEST



Prevalence of cardiovascular diseases in the Northwest: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women.



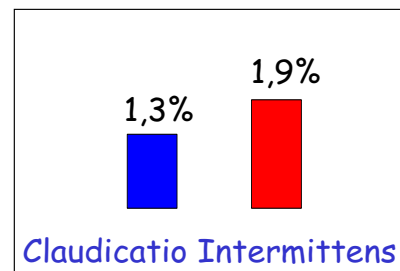
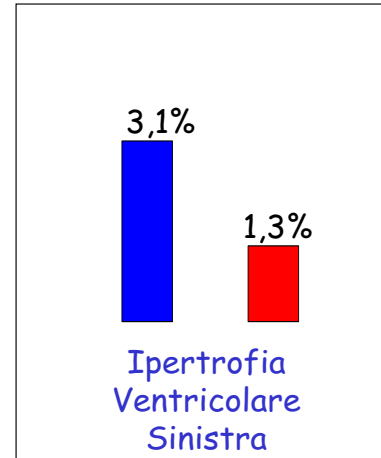
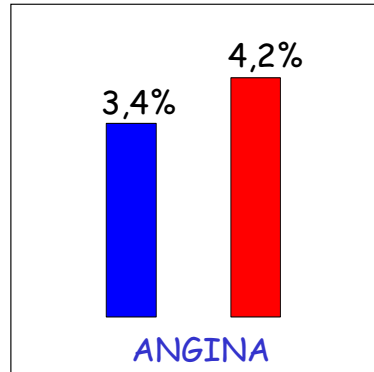
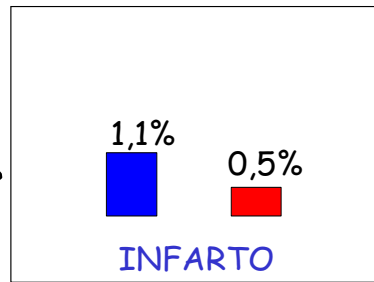
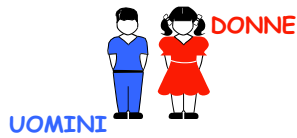
## NORD-EST



Prevalence of cardiovascular diseases in the Northeast: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women.



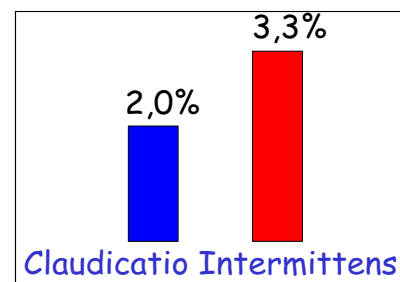
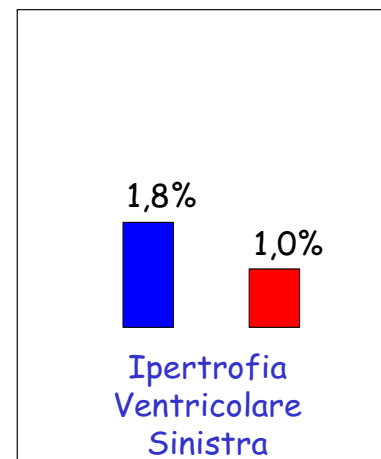
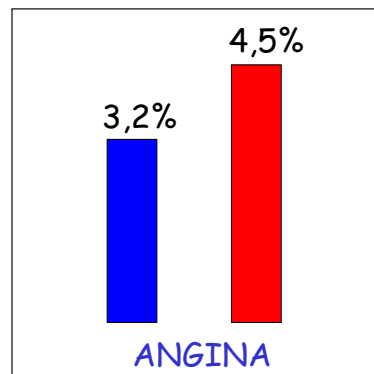
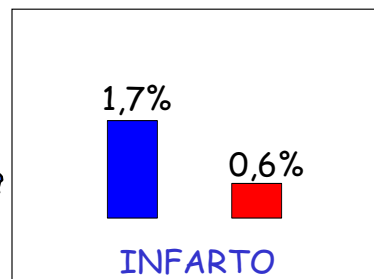
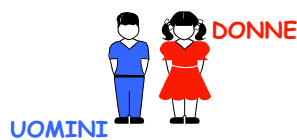
## CENTRO



Prevalence of cardiovascular diseases in the Center: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women.

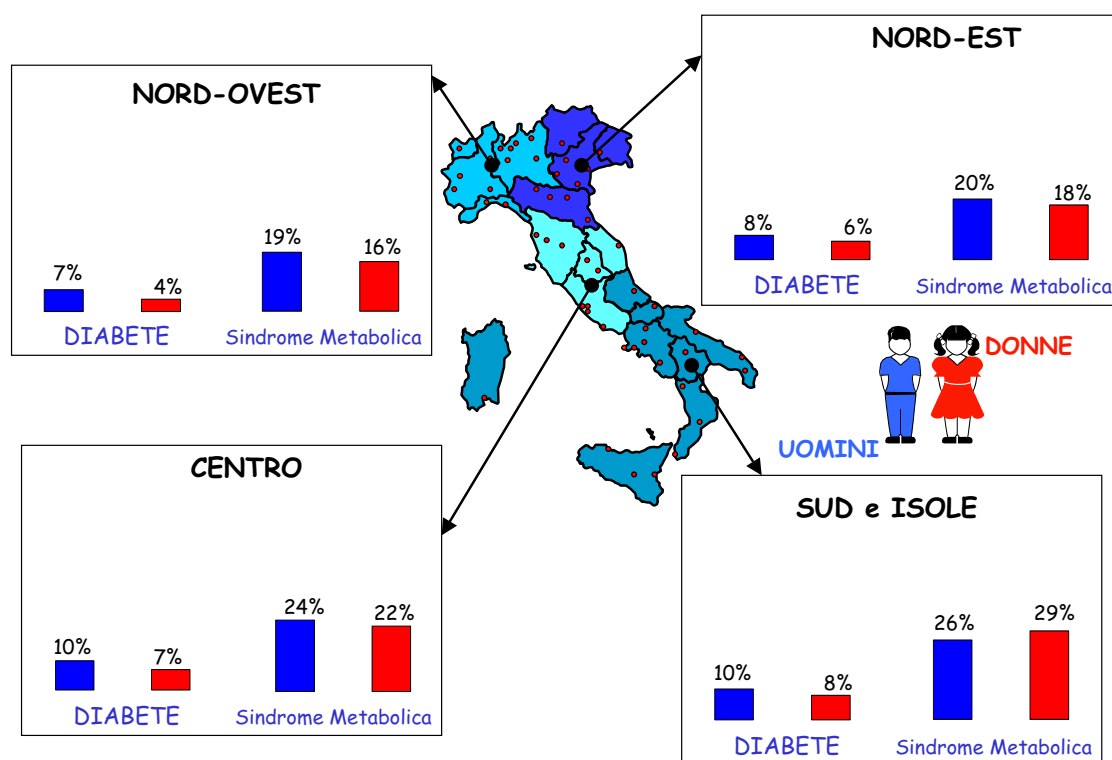


## SUD e ISOLE



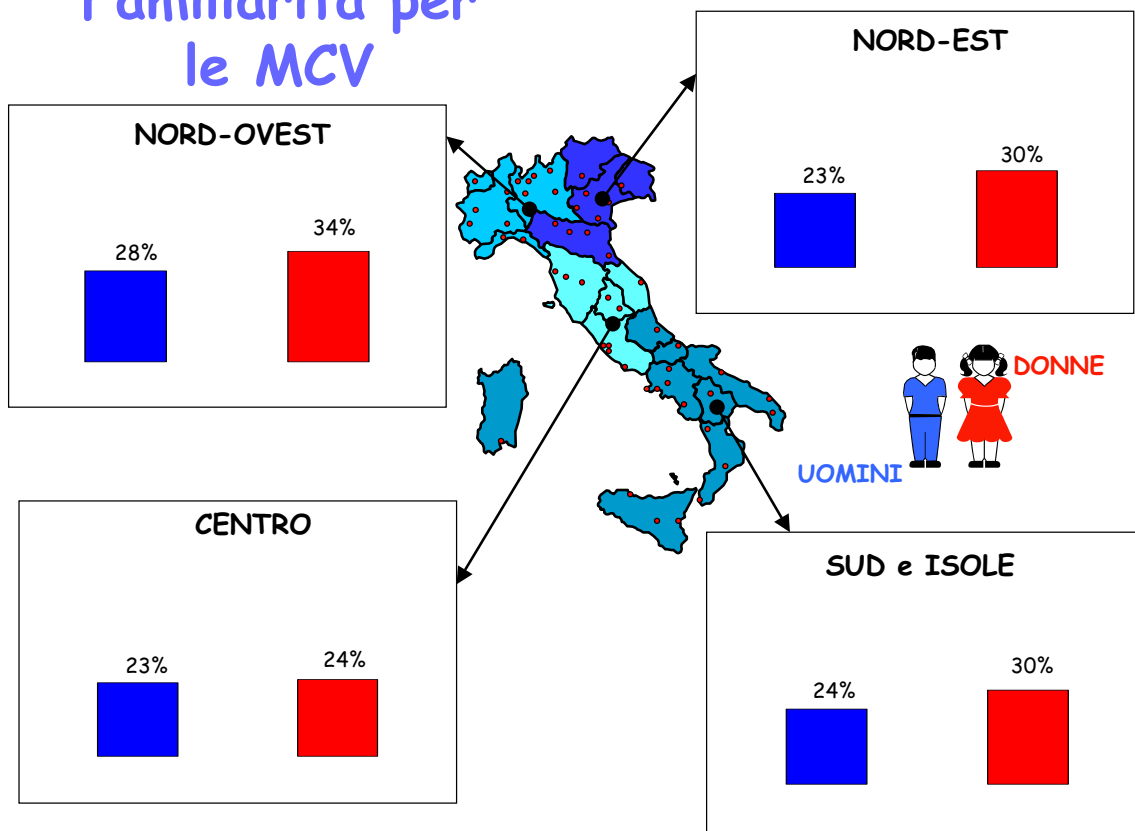
Prevalence of cardiovascular diseases in the South and Islands: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women.

## Diabete e Sindrome Metabolica



Prevalence of diabetes and metabolic syndrome in Italian macroareas. Men and women.

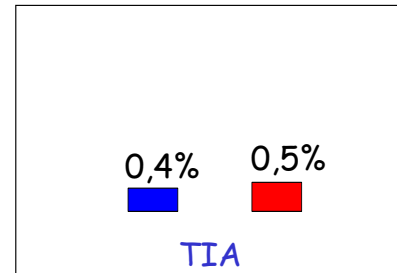
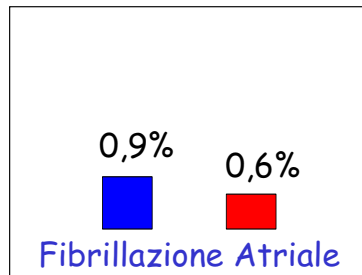
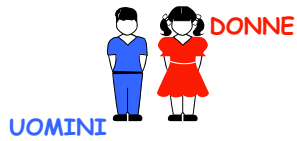
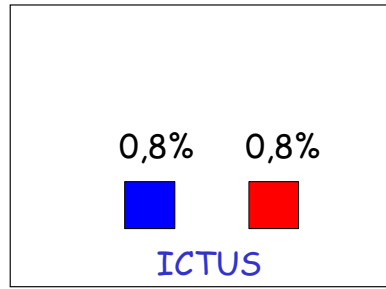
## Familiarità per le MCV



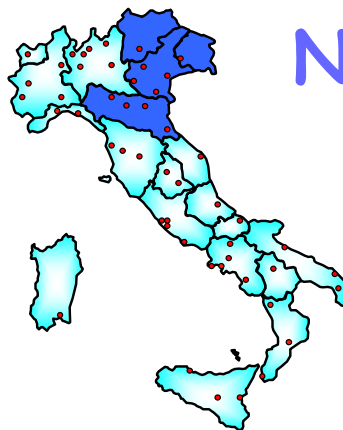
Family history of cardiovascular diseases in Italian macroareas. Men and women.



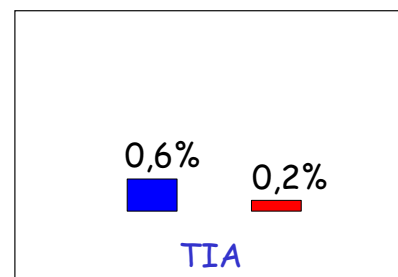
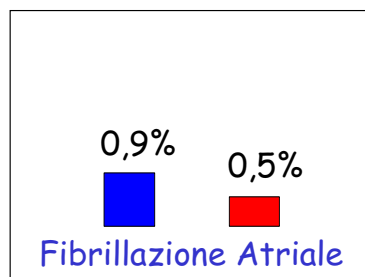
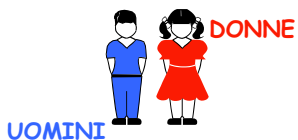
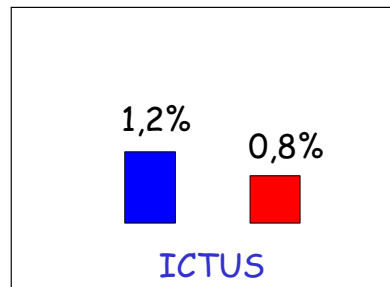
## NORD-OVEST



Prevalence of cardiovascular diseases in the Northwest: stroke, TIA, atrial fibrillation. Men and women.



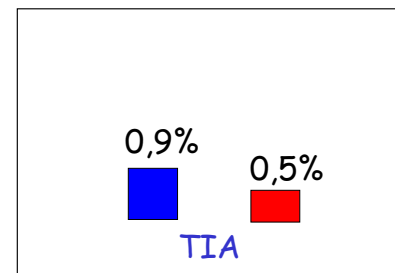
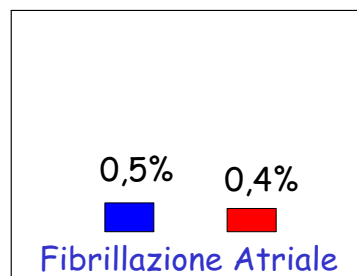
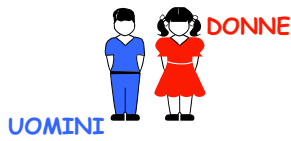
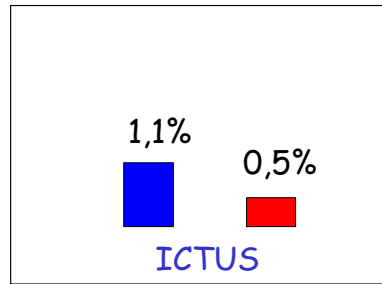
## NORD-EST



Prevalence of cardiovascular diseases in the Northeast: stroke, TIA, atrial fibrillation. Men and women.



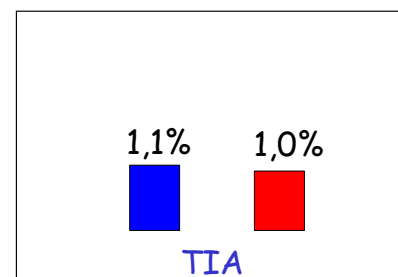
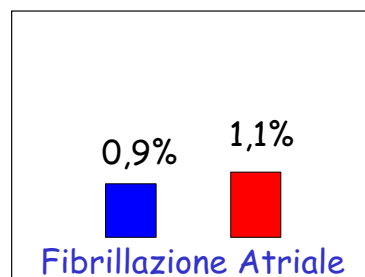
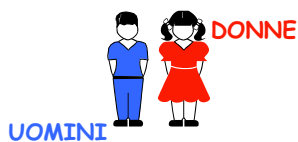
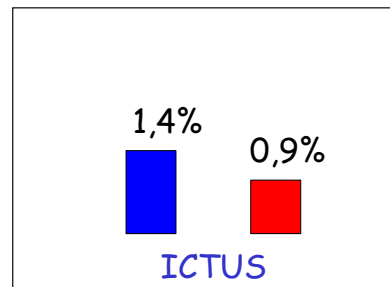
## CENTRO



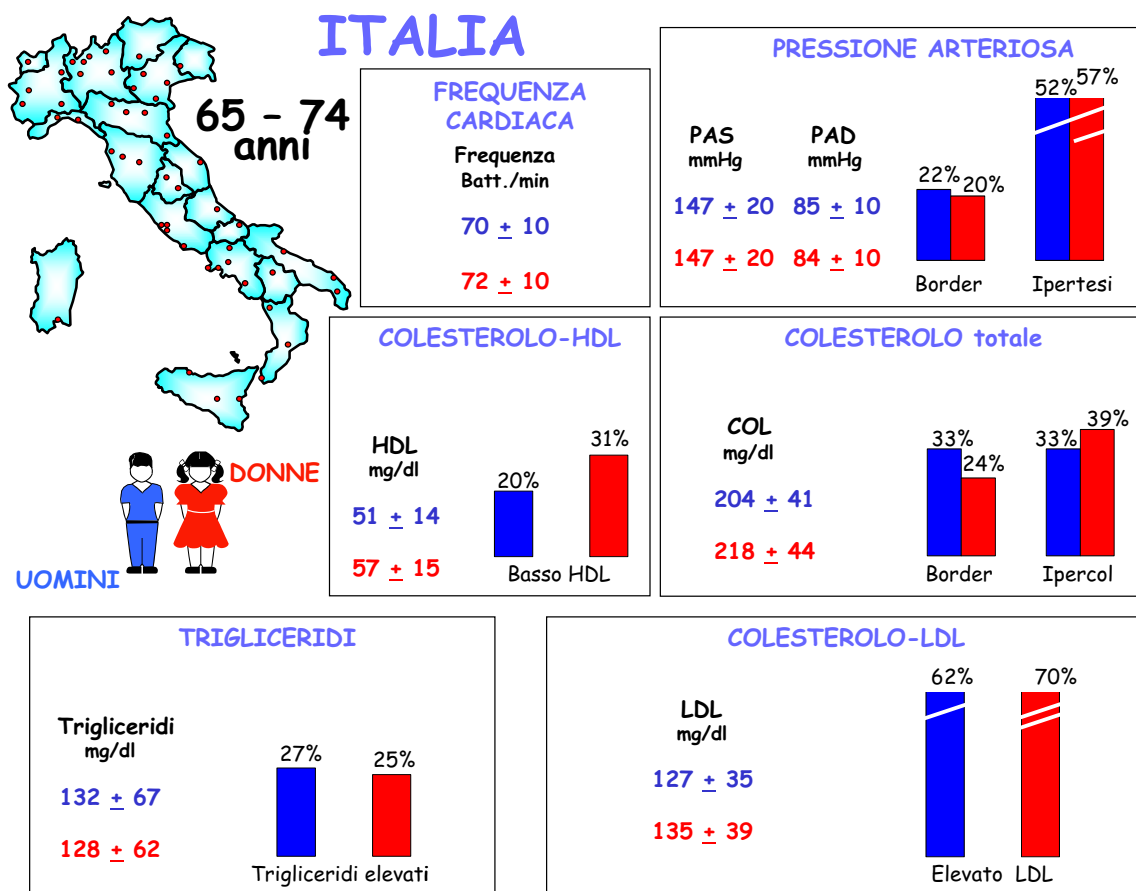
Prevalence of cardiovascular diseases in the Center: stroke, TIA, atrial fibrillation. Men and women.



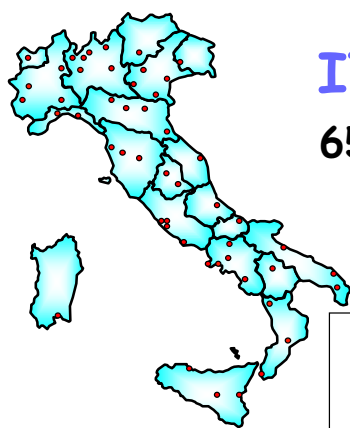
## SUD e ISOLE



Prevalence of cardiovascular diseases in the South and Islands: stroke, TIA, atrial fibrillation. Men and women.

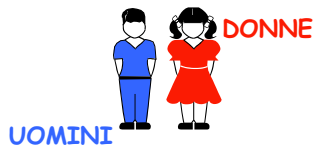


Italy. Mean levels of risk factors: heart rate, blood pressure, total, LDL and HDL cholesterol, triglycerides; prevalence of high-risk conditions: borderline and hypertensives, borderline and hypercholesterolemia, high triglycerides, high LDL and low HDL cholesterol. Men and women aged 65-74 years.



# ITALIA

65 - 74  
anni



## GLICEMIA e Intolleranza al Glucosio

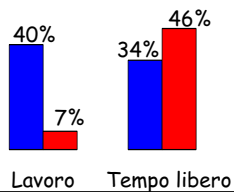
Glicemia  
mg/dl

98 ± 32

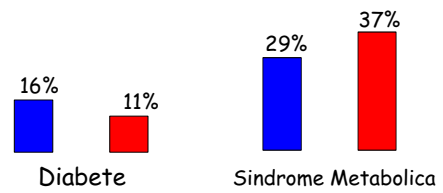
93 ± 29



## INATTIVITA' FISICA



## DIABETE e Sindrome Metabolica



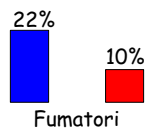
## ABITUDINE al FUMO di SIGARETTA

Fumatori

Sig/die

13 ± 8

12 ± 7

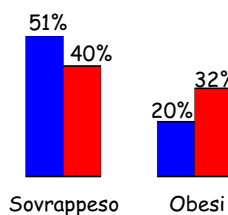


## INDICE di MASSA CORPorea e OBESITA'

IMC  
Kg/m<sup>2</sup>

27 ± 4

28 ± 5



## Misure Antropometriche e Indice di Adiposità Addominale

Vita  
cm

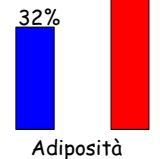
98 ± 11

91 ± 12

Fianchi  
cm

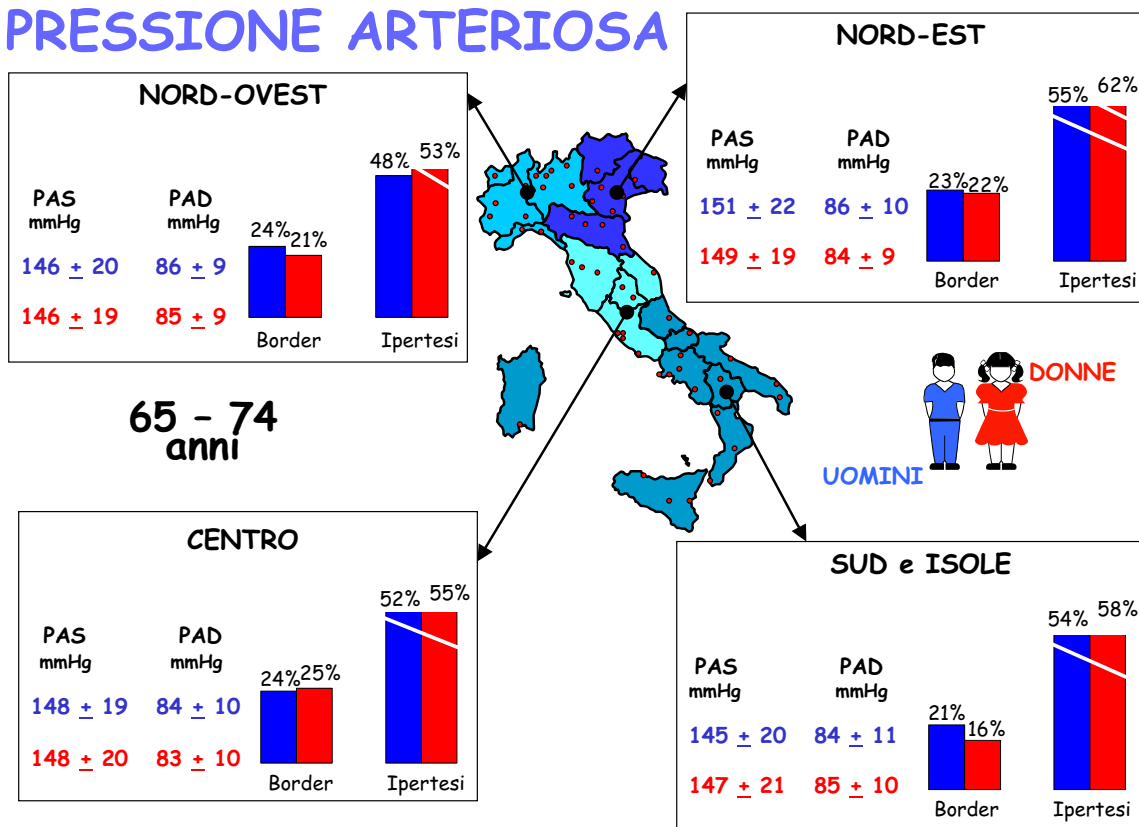
103 ± 19

106 ± 11



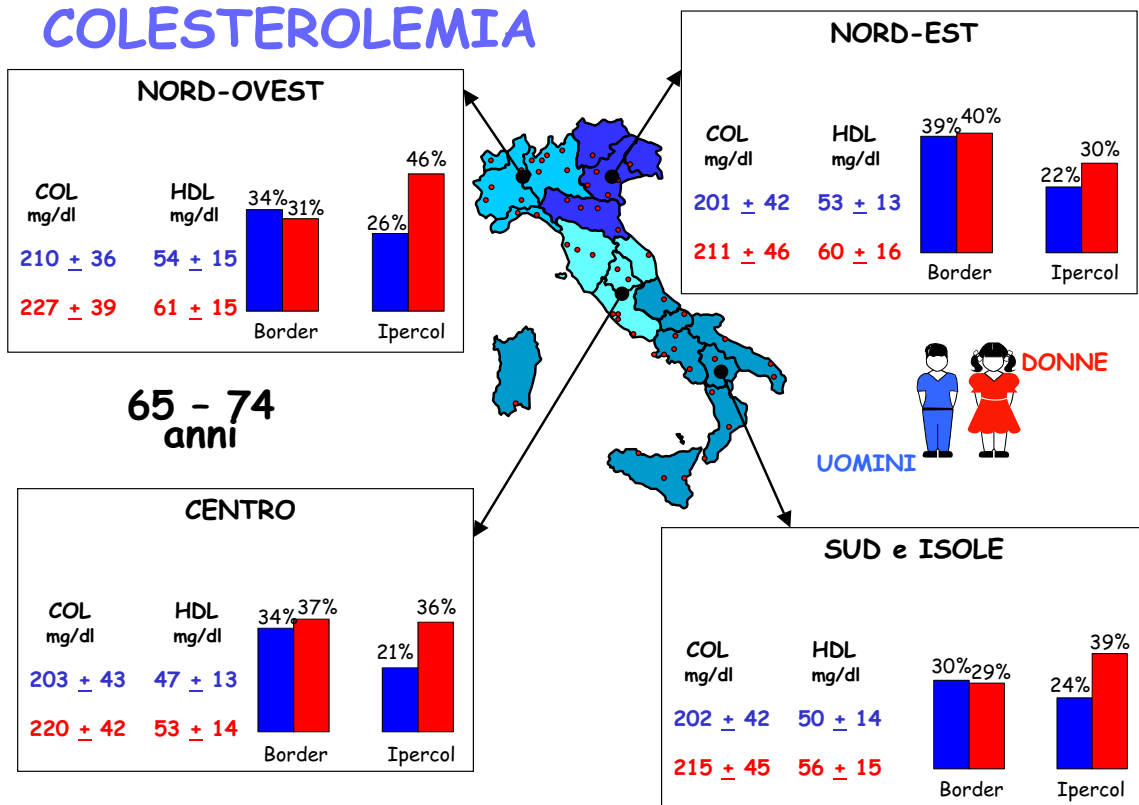
Italy. Mean levels of risk factors: fasting blood glucose, number of cigarettes smoked per day, waist, hip; prevalence of high-risk conditions: physical inactivity, diabetes and metabolic syndrome, smoking habit, body mass index and obesity, and adiposity index. Men and women aged 65-74 years.

# PRESSIONE ARTERIOSA



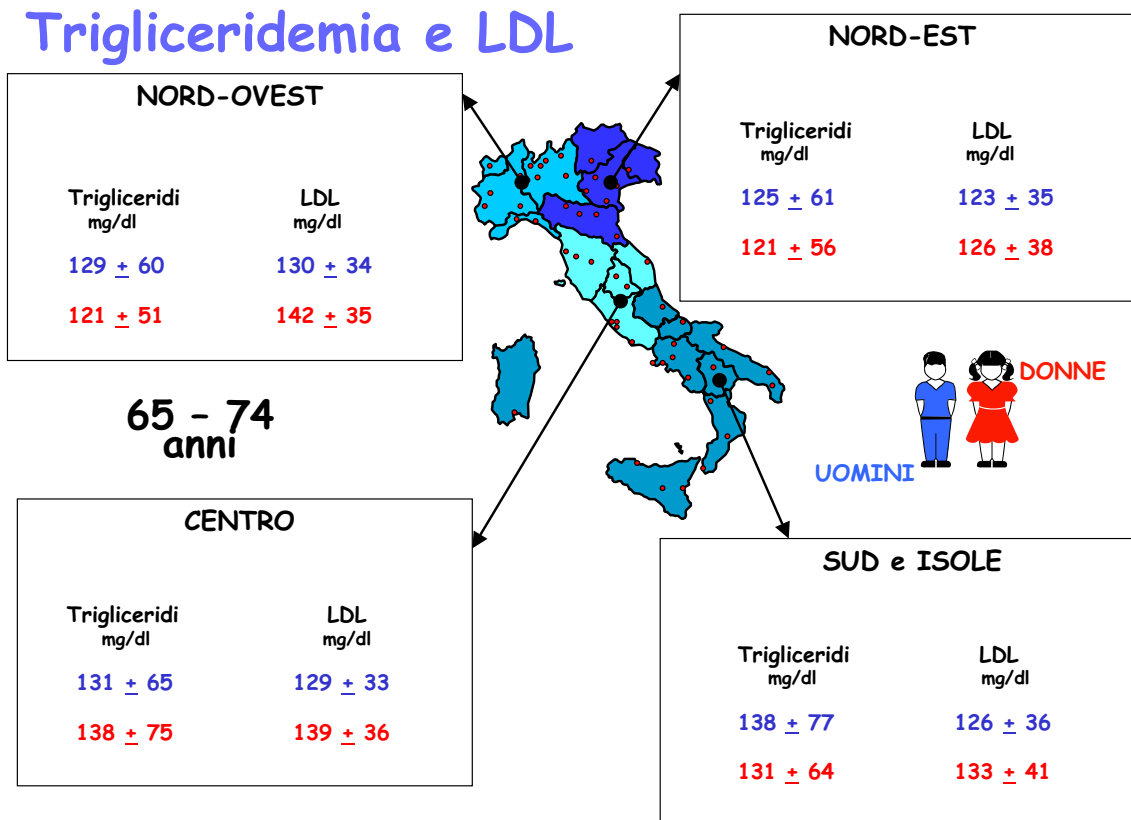
Mean levels of blood pressure and prevalence of hypertension in Italian macroareas. Men and women aged 65-74 years.

# COLESTEROLEMIA



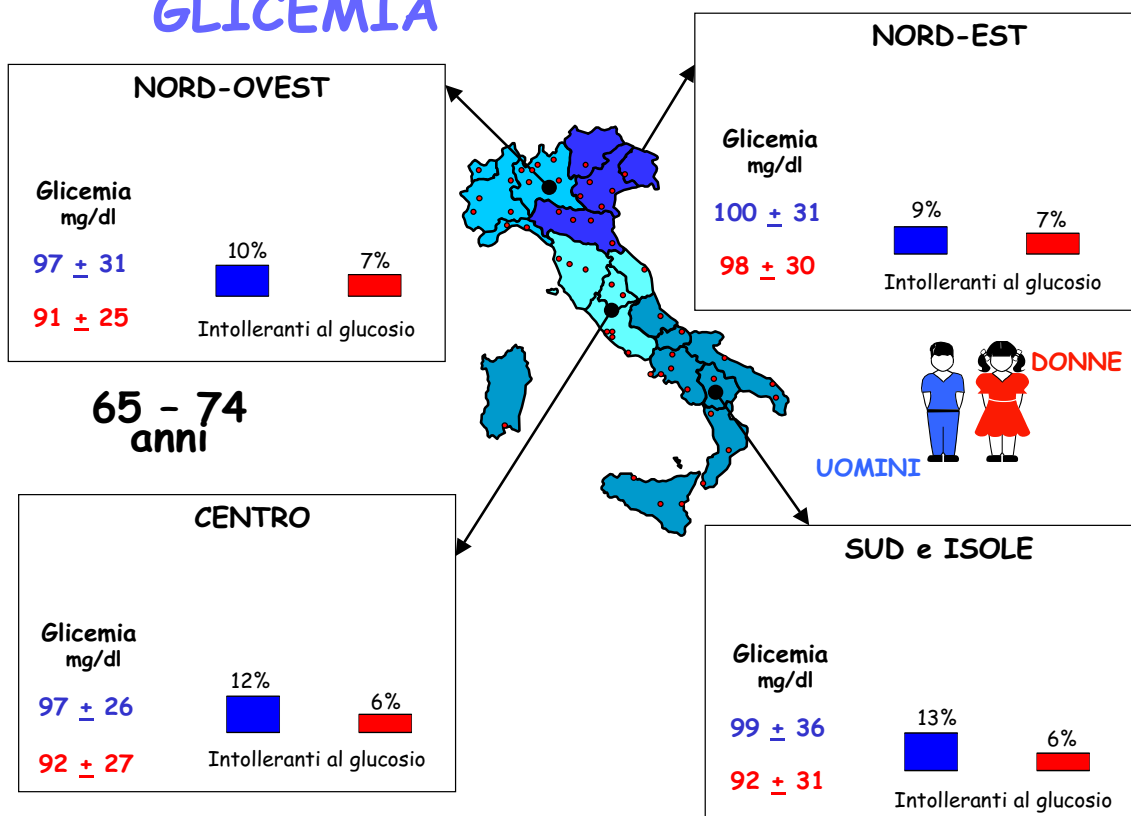
Mean levels of total and HDL cholesterol and prevalence of hypercholesterolemia in Italian macroareas. Men and women aged 65-74 years.

## Trigliceridemia e LDL



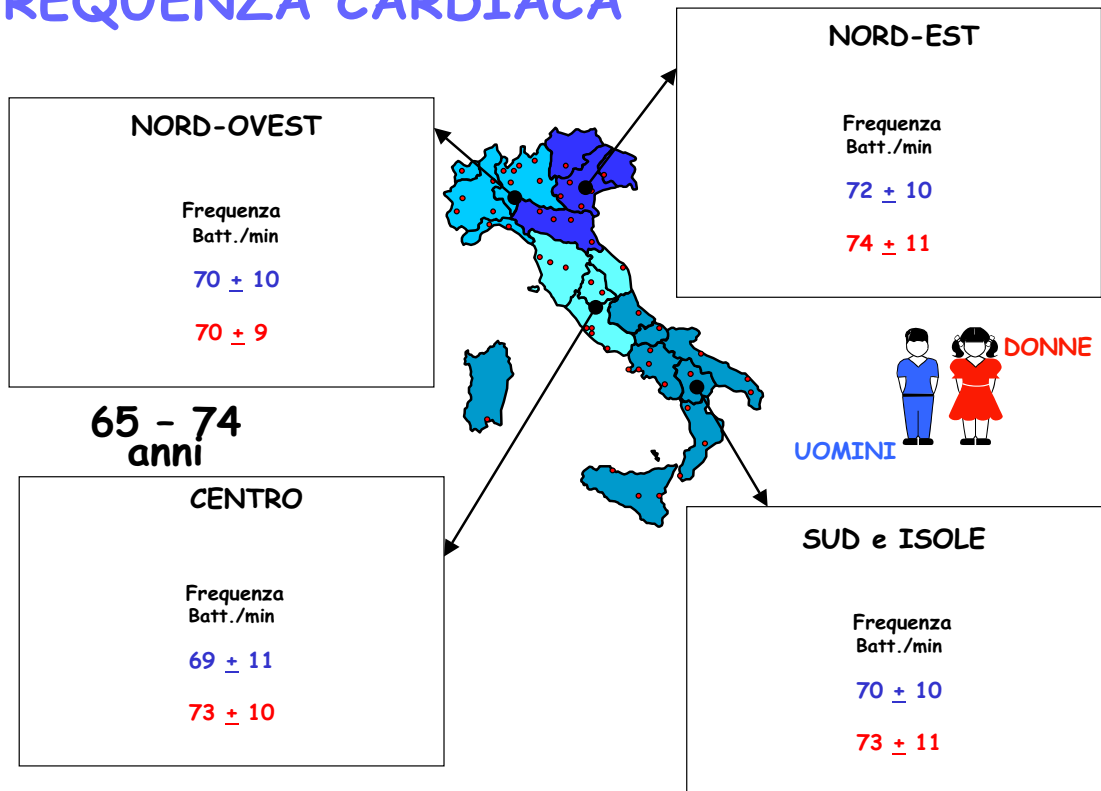
Mean levels of triglycerides and LDL cholesterol in Italian macroareas. Men and women aged 65-74 years.

## GLICEMIA



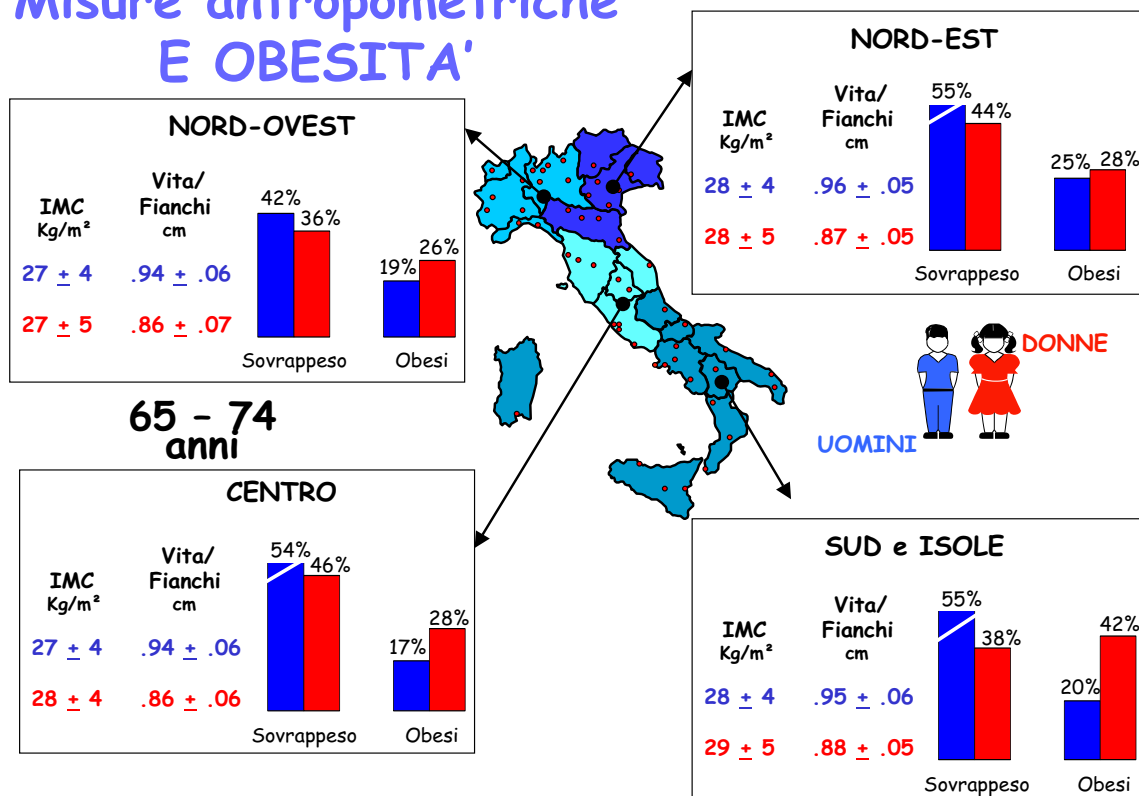
Mean levels of fasting blood glucose and prevalence of impaired glucose tolerance in Italian macroareas. Men and women aged 65-74 years.

## FREQUENZA CARDIACA



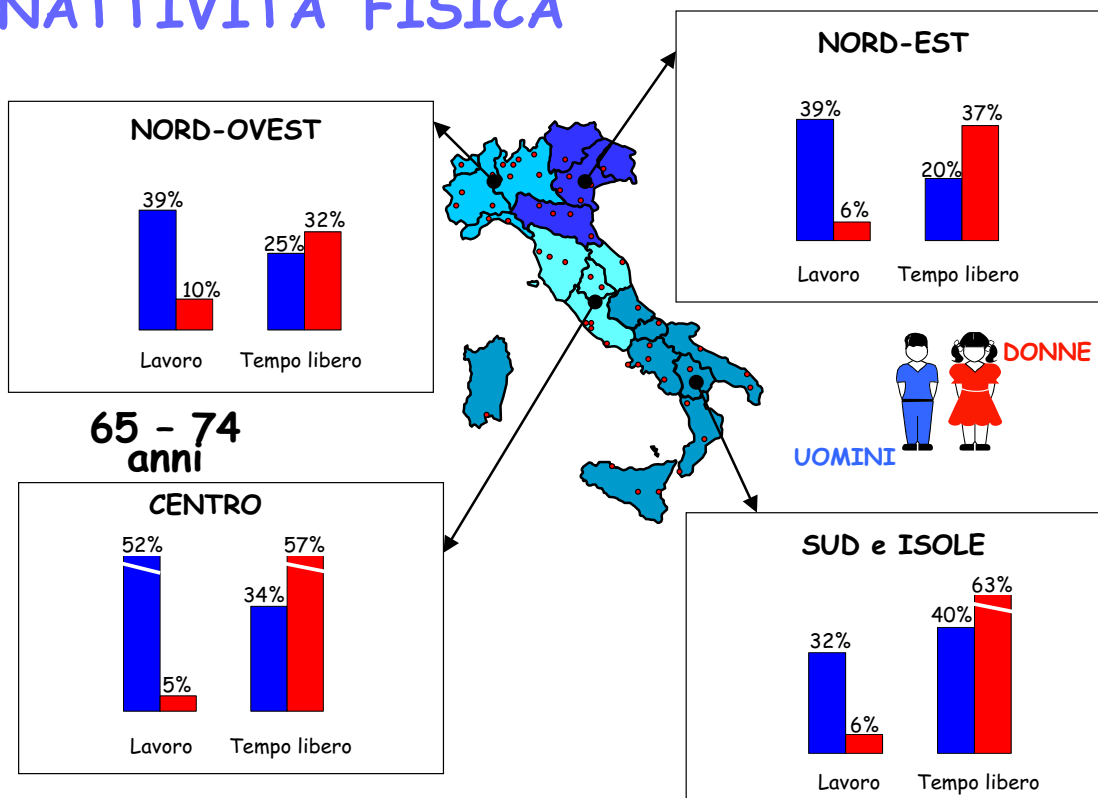
Mean levels of heart rate in Italian macroareas. Men and women aged 65-74 years.

## Misure antropometriche E OBESITA'



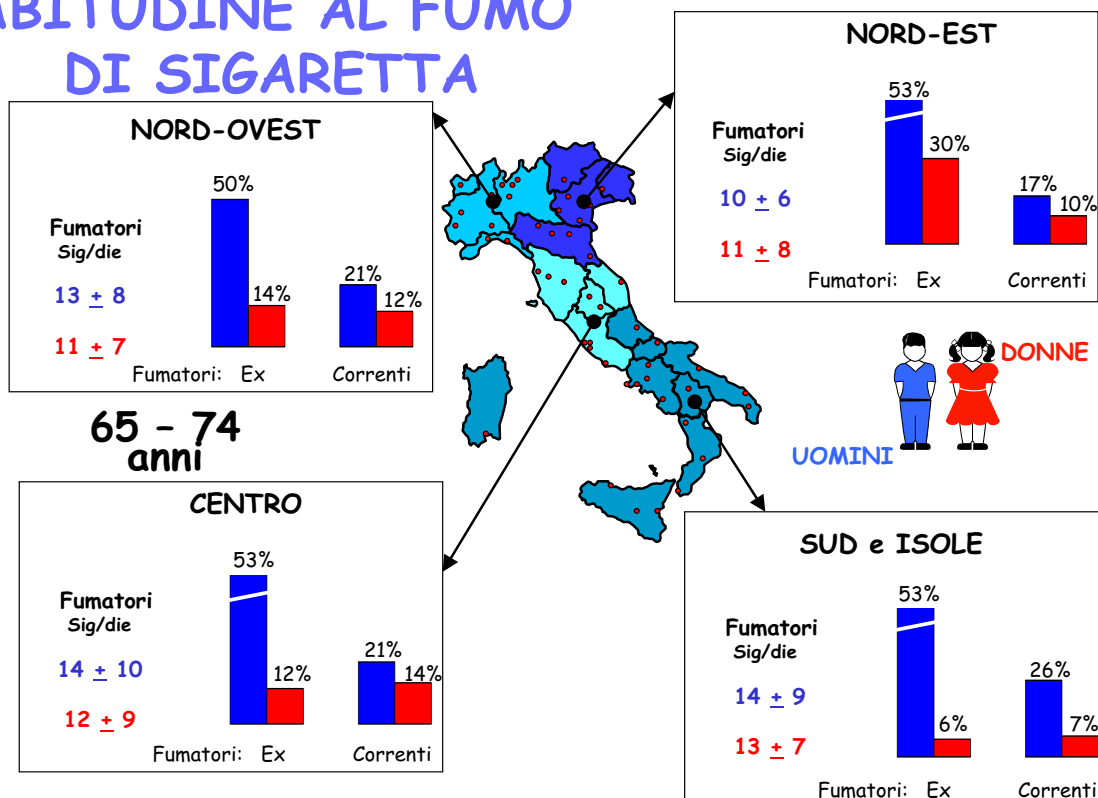
Mean levels of body mass index and prevalence of overweight and obesity in Italian macroareas. Men and women aged 65-74 years.

## INATTIVITA' FISICA

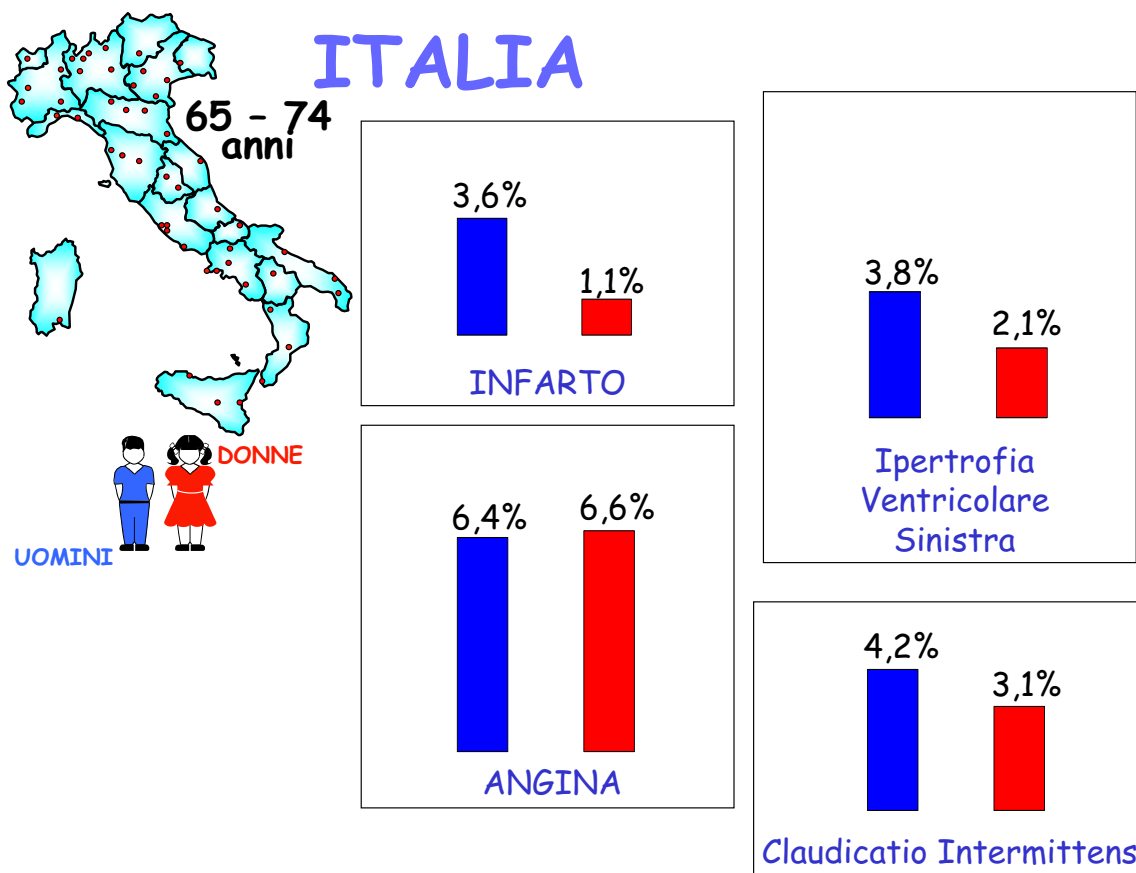


Prevalence of physical inactivity at work and leisure time in Italian macroareas. Men and women aged 65-74 years.

## ABITUDINE AL FUMO DI SIGARETTA



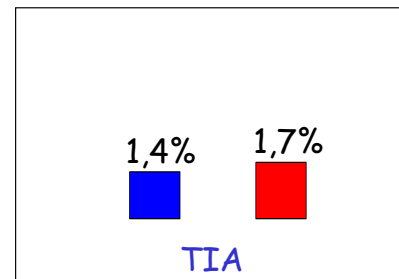
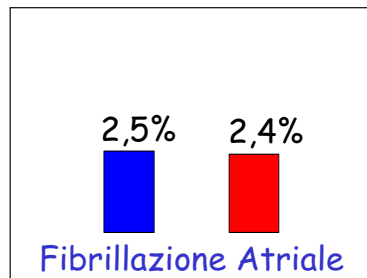
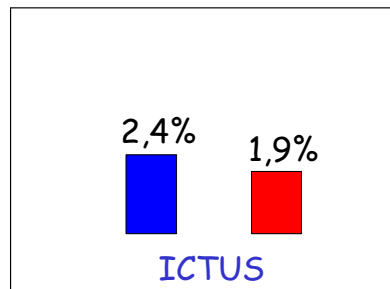
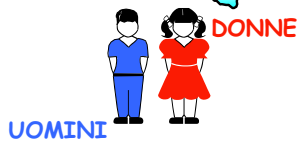
Prevalence of smoking habit and mean number of cigarettes smoked per day in smokers in Italian macroareas. Men and women aged 65-74 years.



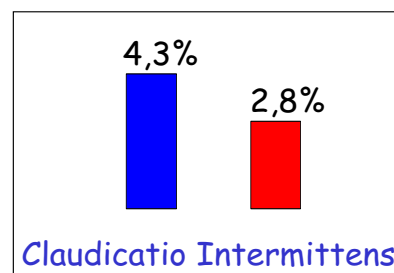
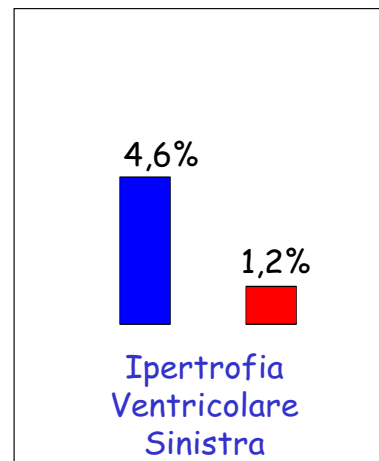
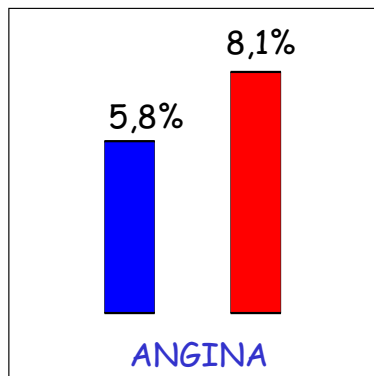
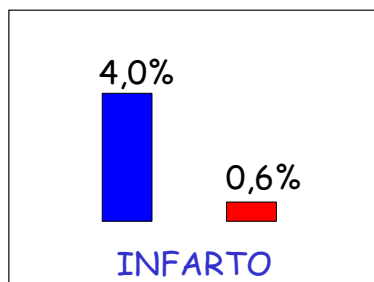
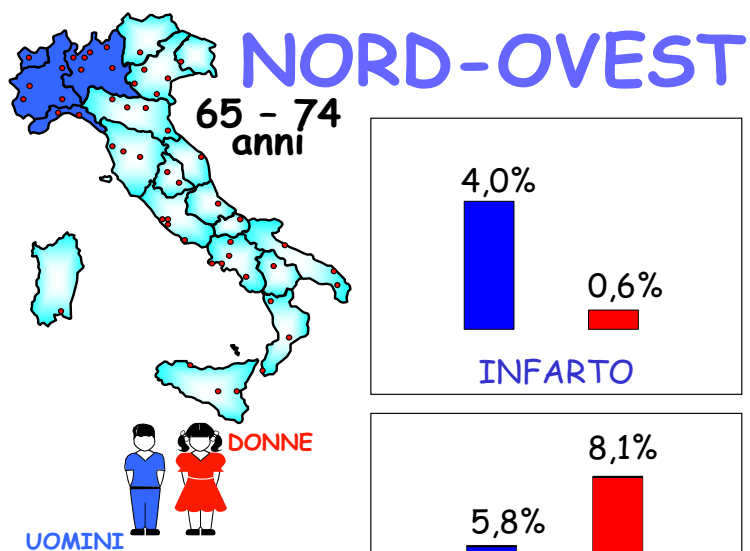
Italy. Prevalence of cardiovascular diseases: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women aged 65-74 years.



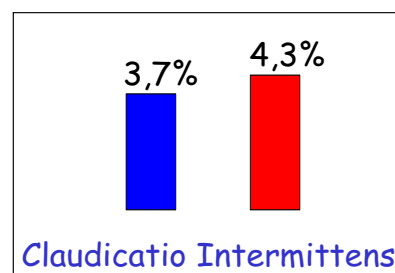
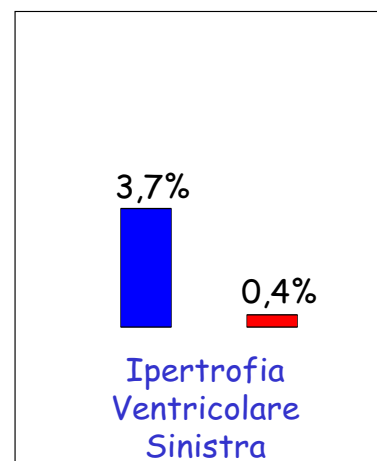
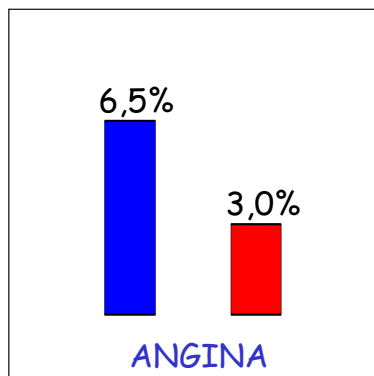
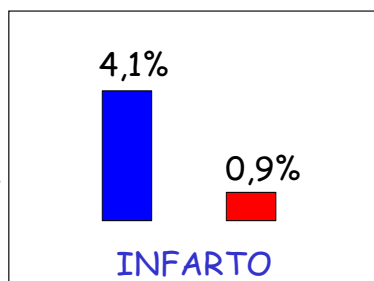
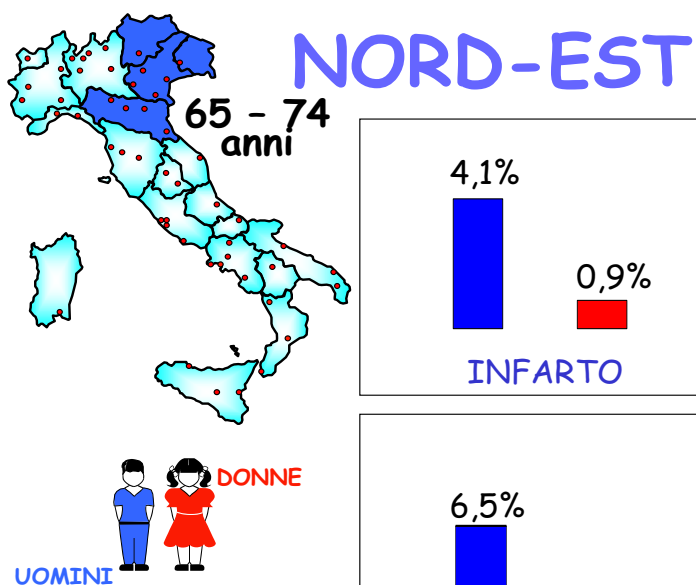
# ITALIA



Italy. Prevalence of cardiovascular diseases: stroke, TIA, atrial fibrillation. Men and women aged 65-74 years.



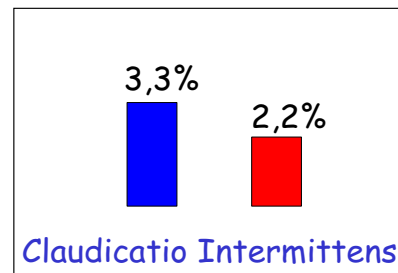
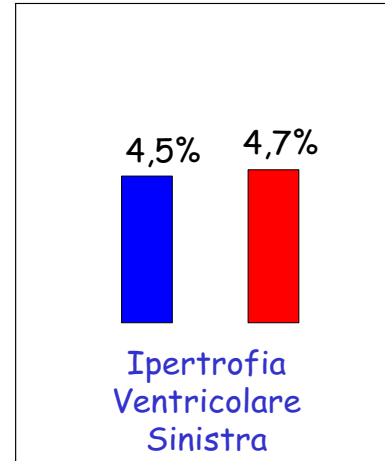
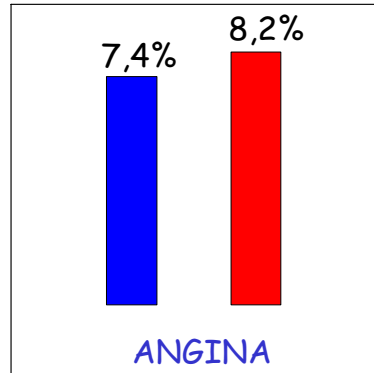
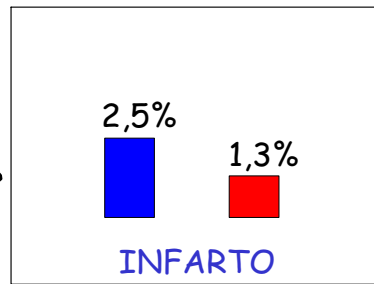
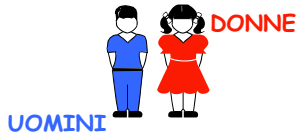
Prevalence of cardiovascular diseases in the Northwest: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women aged 65-74 years.



Prevalence of cardiovascular diseases in the Northeast: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women aged 65-74 years.



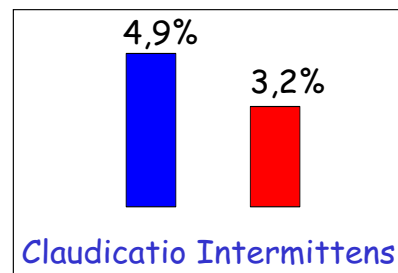
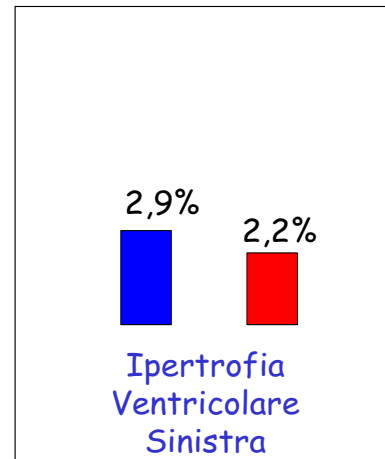
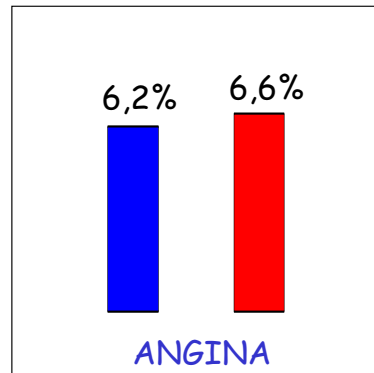
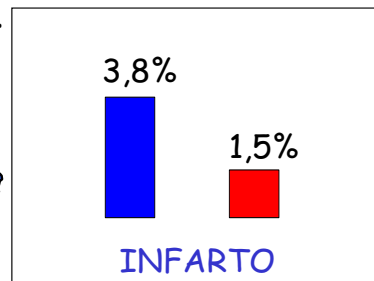
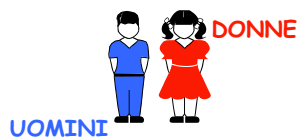
## CENTRO



Prevalence of cardiovascular diseases in the Center: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women aged 65-74 years.

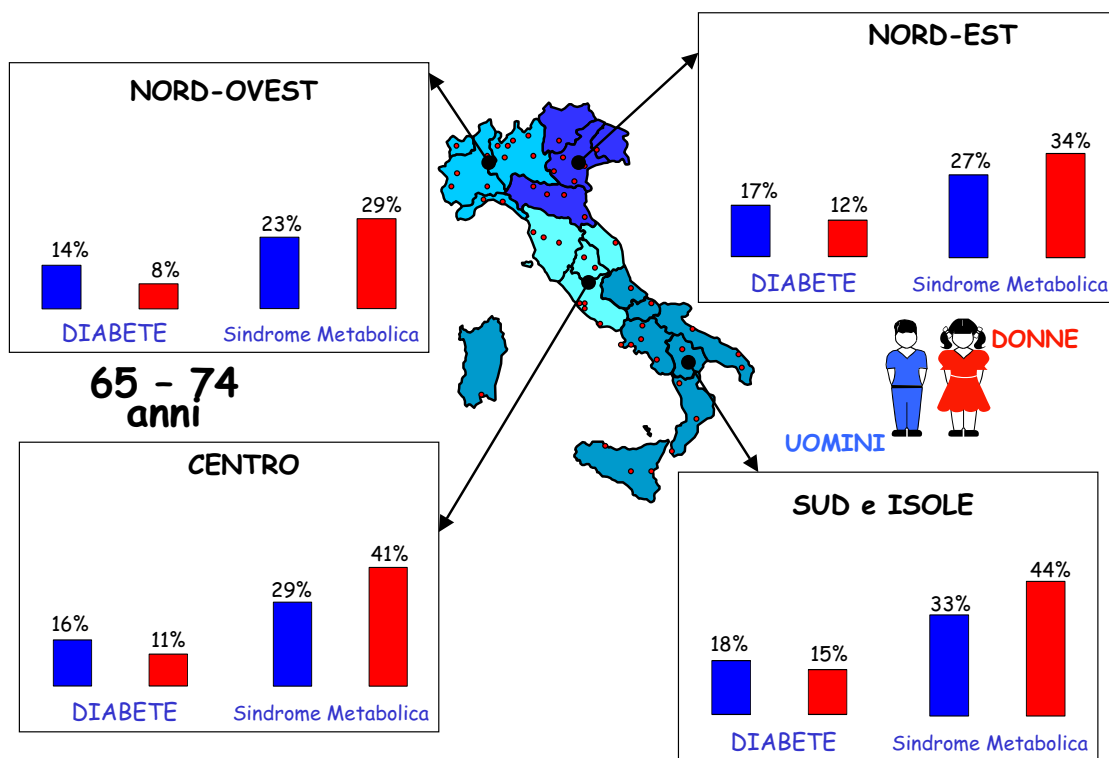


## SUD e ISOLE



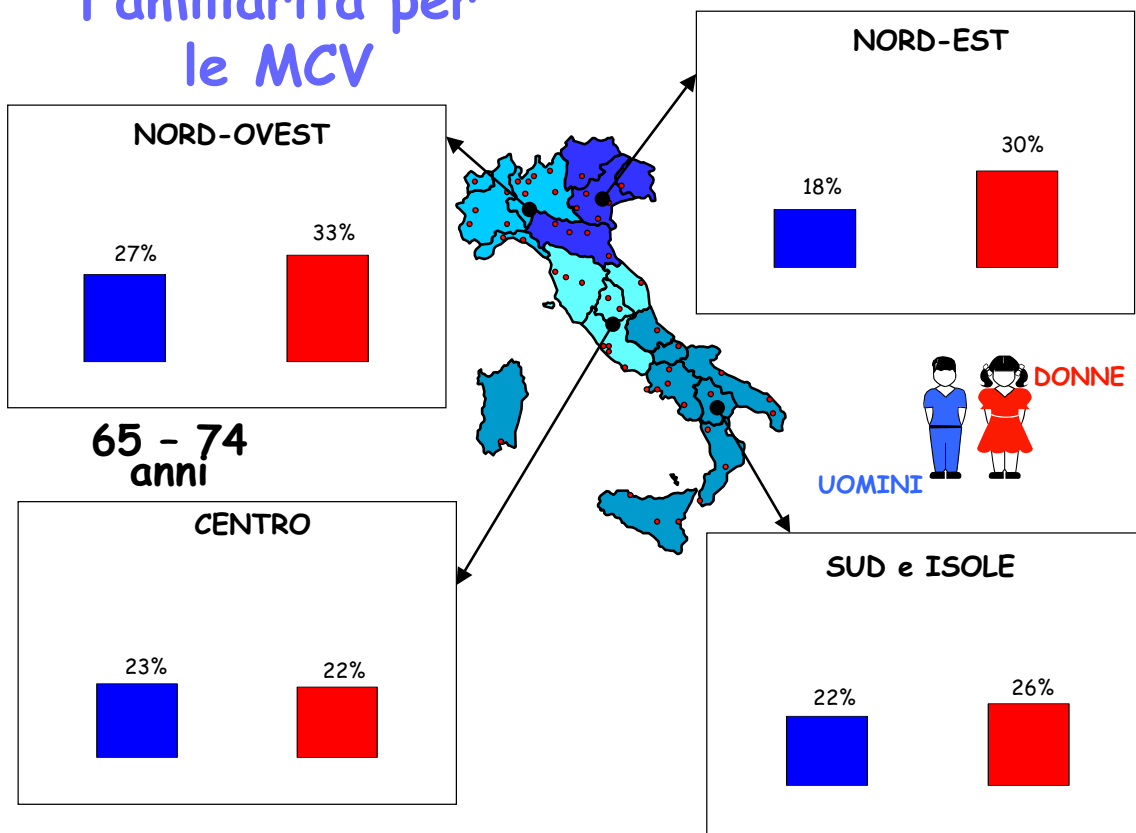
Prevalence of cardiovascular diseases in the South and Islands: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens. Men and women aged 65-74 years.

## Diabete e Sindrome Metabolica

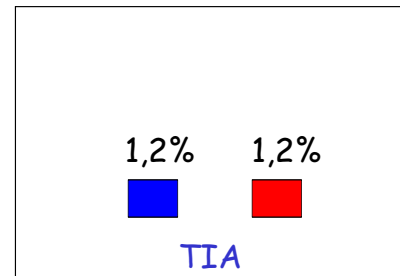
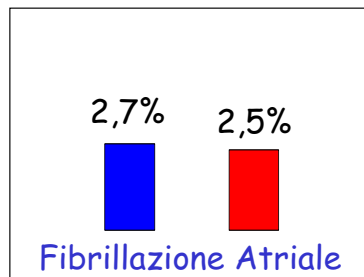
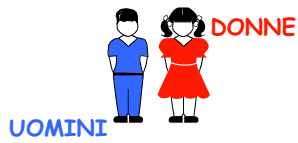
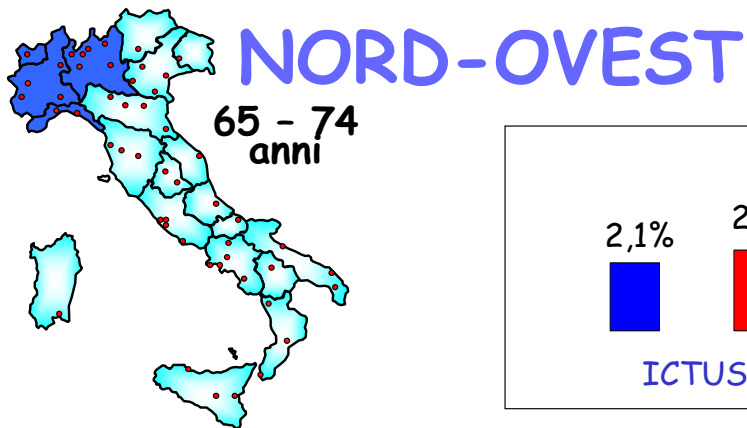


Prevalence of diabetes and metabolic syndrome in Italian macroareas. Men and women aged 65-74 years.

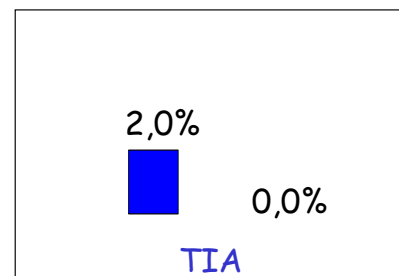
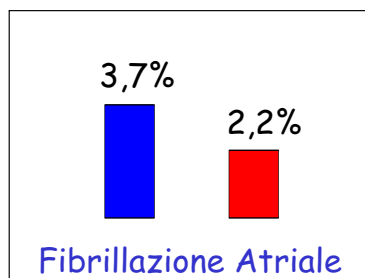
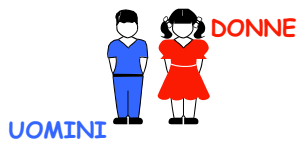
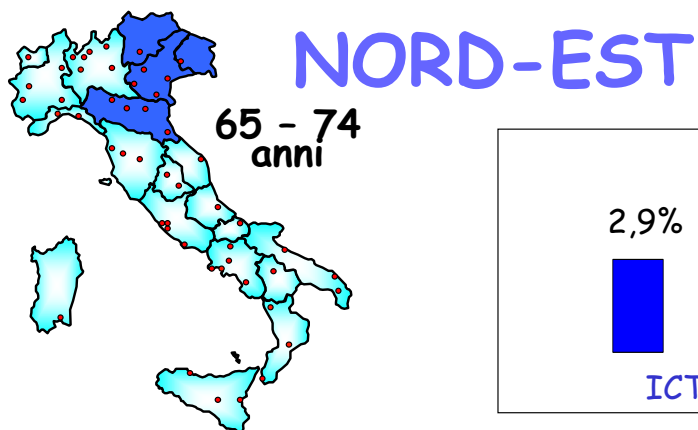
## Familiarità per le MCV



Family history of cardiovascular diseases in Italian macroareas. Men and women aged 65-74 years.



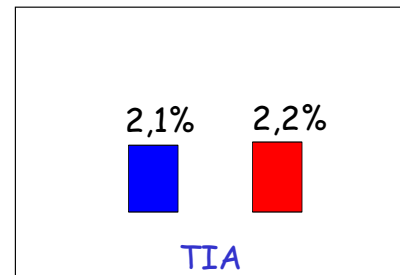
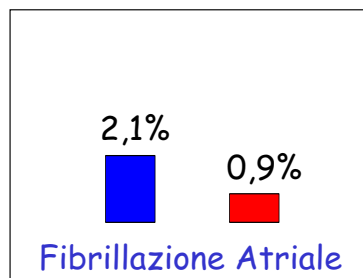
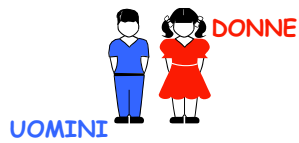
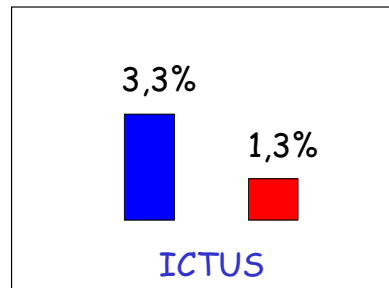
Prevalence of cardiovascular diseases in the Northwest: stroke, TIA, atrial fibrillation. Men and women aged 65-74 years.



Prevalence of cardiovascular diseases in the Northeast: stroke, TIA, atrial fibrillation. Men and women aged 65-74 years.



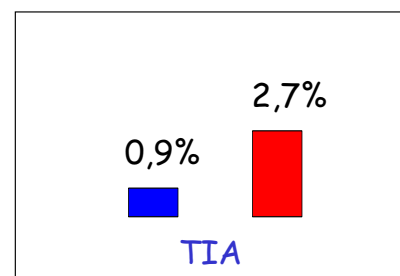
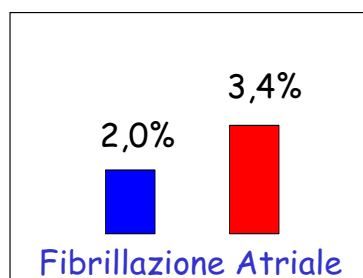
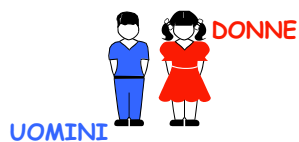
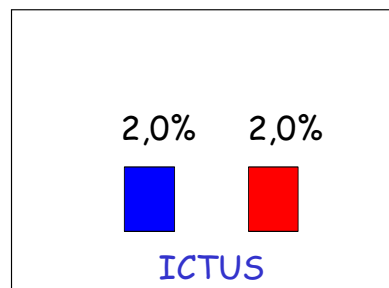
## CENTRO



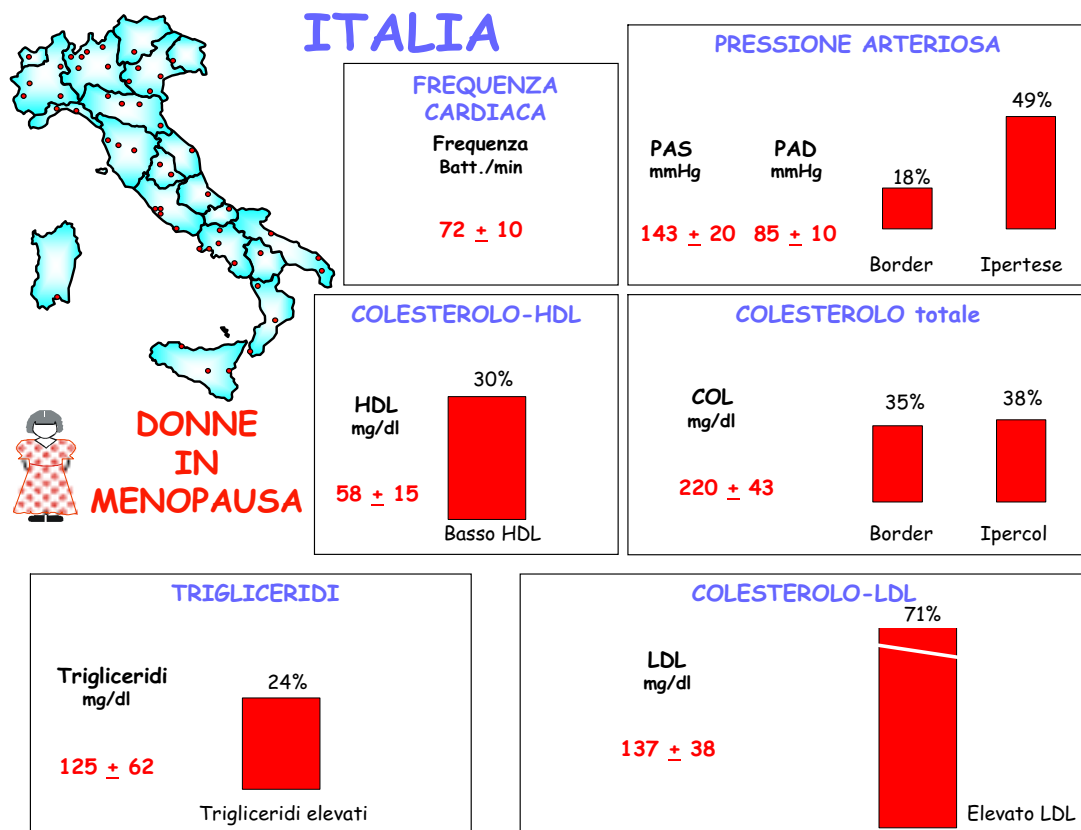
Prevalence of cardiovascular diseases in the Center: stroke, TIA, atrial fibrillation. Men and women aged 65-74 years.



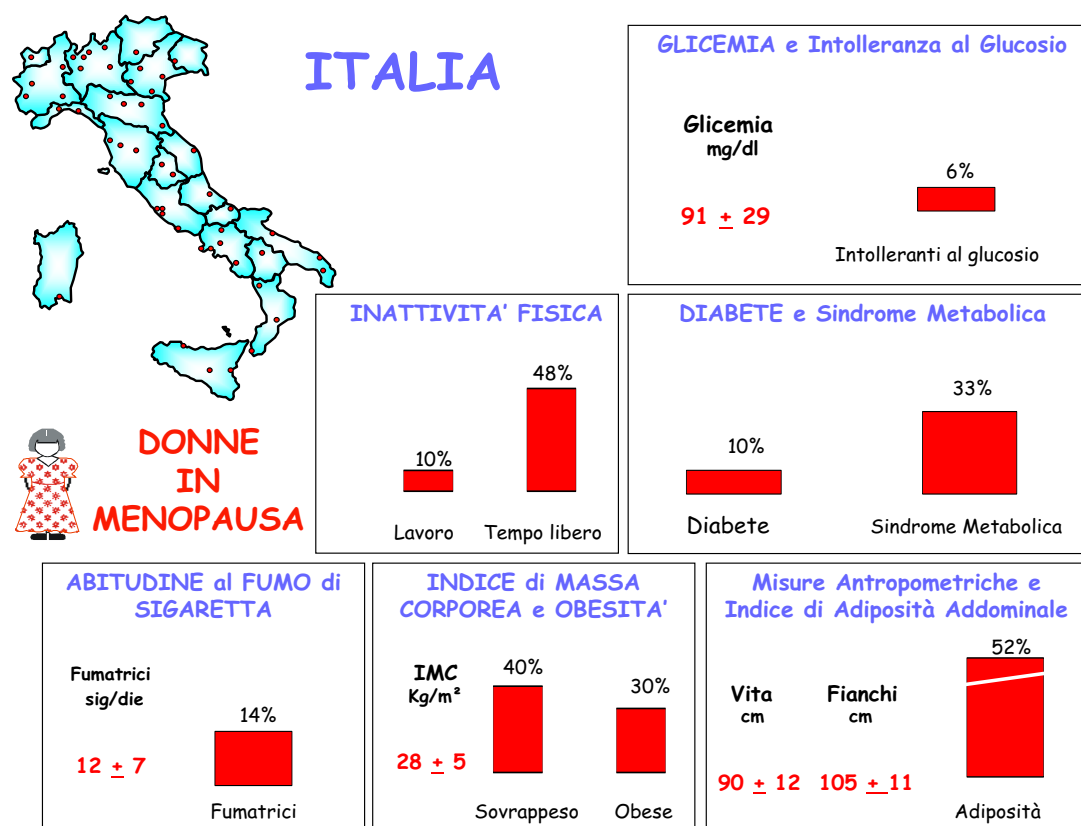
## SUD e ISOLE



Prevalence of cardiovascular diseases in the South and Islands: stroke, TIA, atrial fibrillation. Men and women aged 65-74 years.

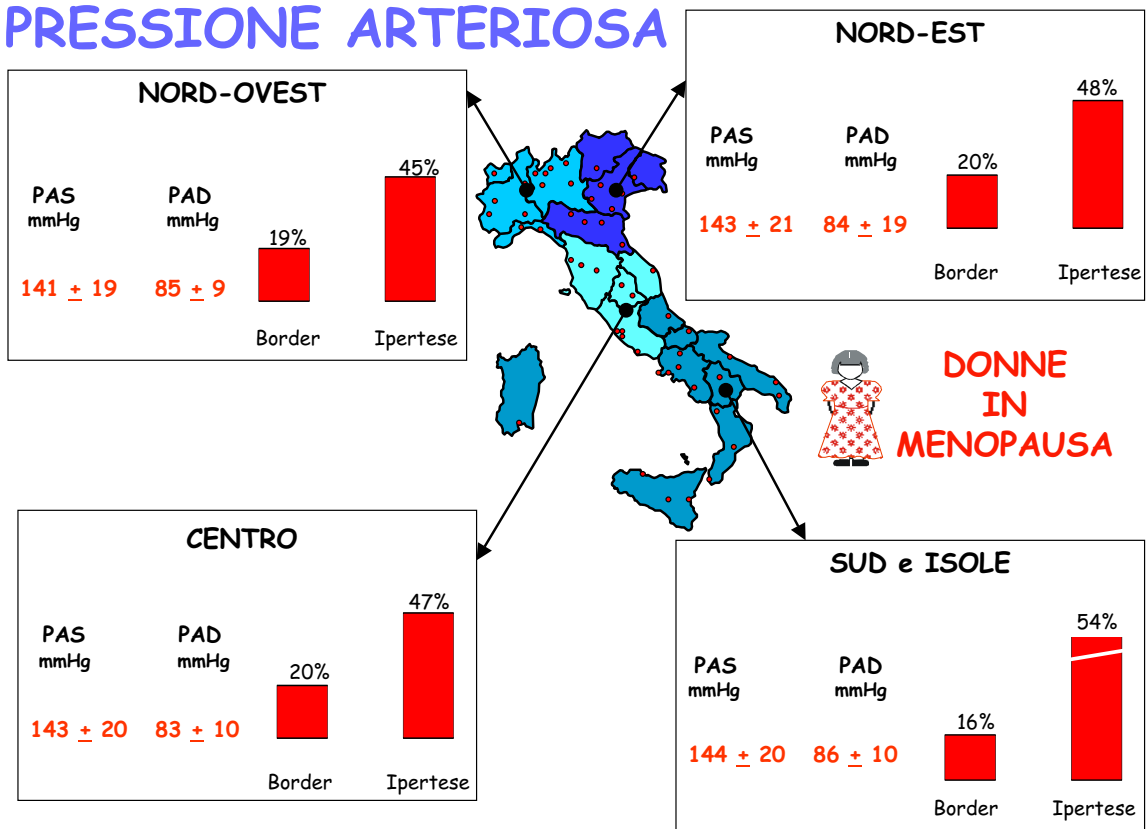


Italy. Mean levels of risk factors: heart rate, blood pressure, total, LDL and HDL cholesterol, triglycerides; prevalence of high-risk conditions: borderline and hypertensives, borderline and hypercholesterolemia, high triglycerides, high LDL and low HDL cholesterol. Menopausal women.



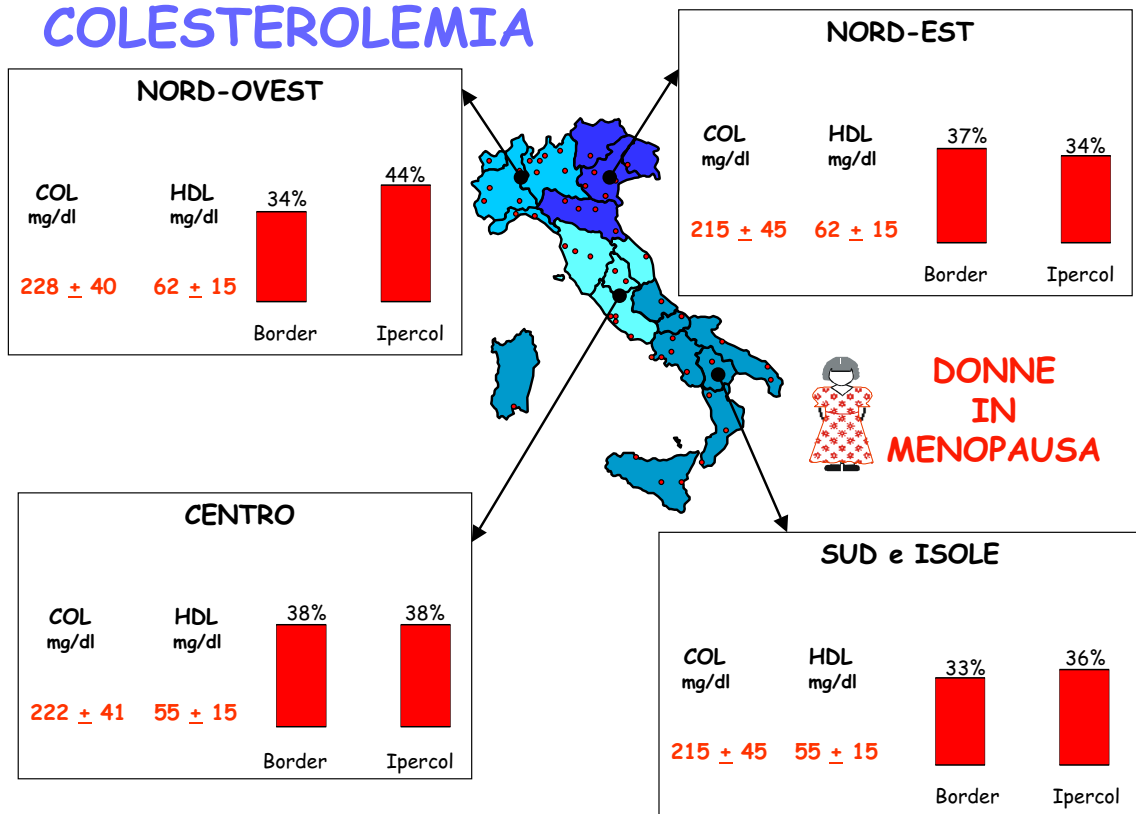
Italy. Mean levels of risk factors: fasting blood glucose, number of cigarettes smoked per day in smokers, waist, hip; prevalence of high-risk conditions: physical inactivity, diabetes and metabolic syndrome, smoking habit, body mass index and obesity, and adiposity index. Menopausal women.

# PRESSIONE ARTERIOSA



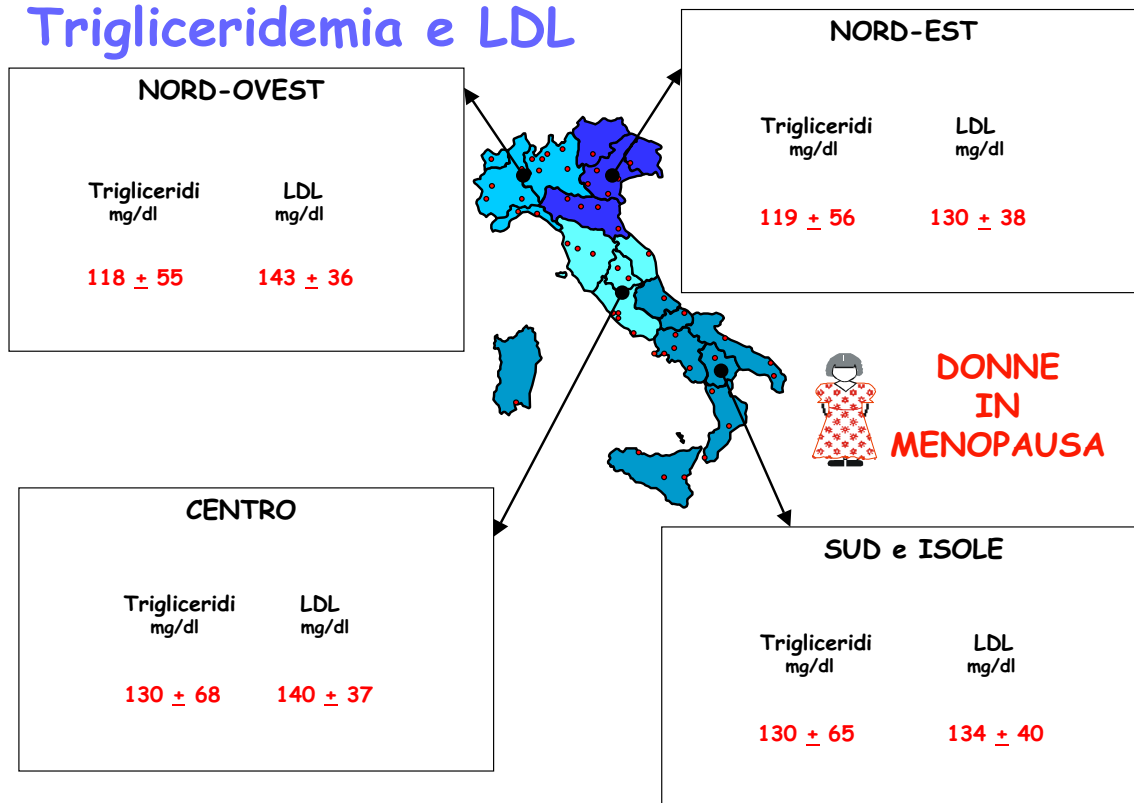
Mean levels of blood pressure and prevalence of hypertension in Italian macroareas. Menopausal women.

# COLESTEROLEMIA



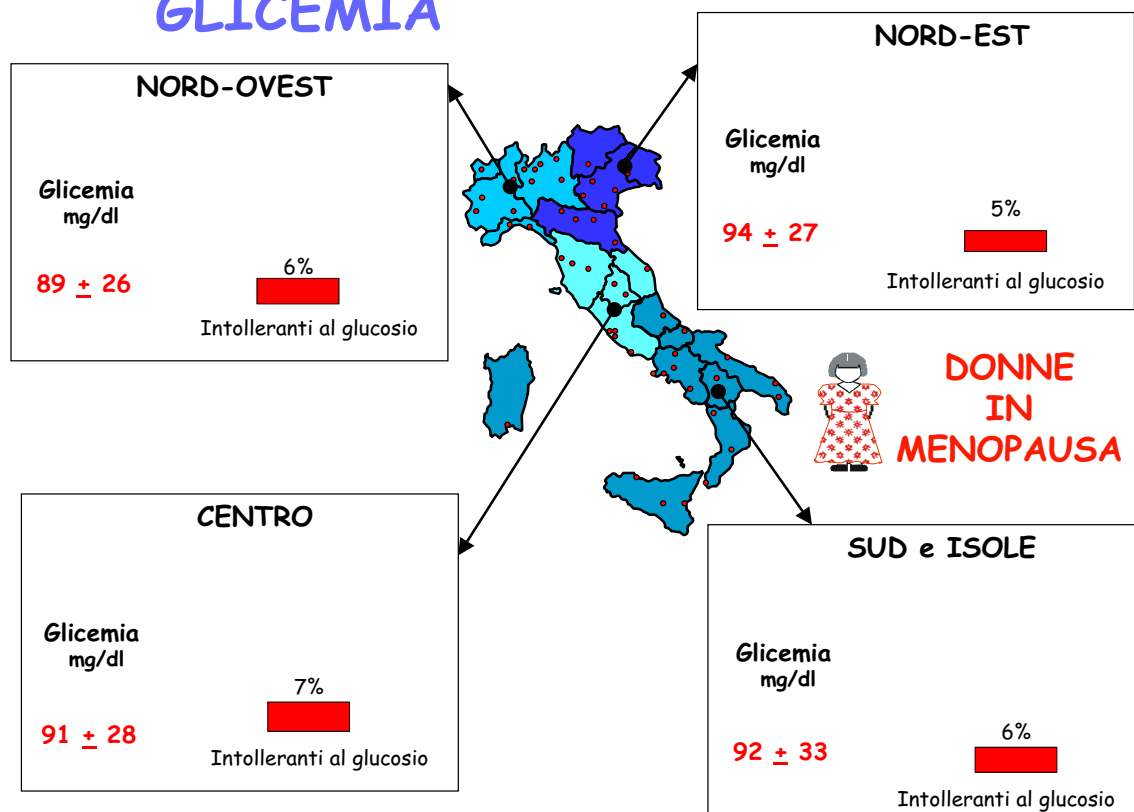
Mean levels of total and HDL cholesterol and prevalence of hypercholesterolemia in Italian macroareas. Menopausal women.

## Trigliceridemia e LDL



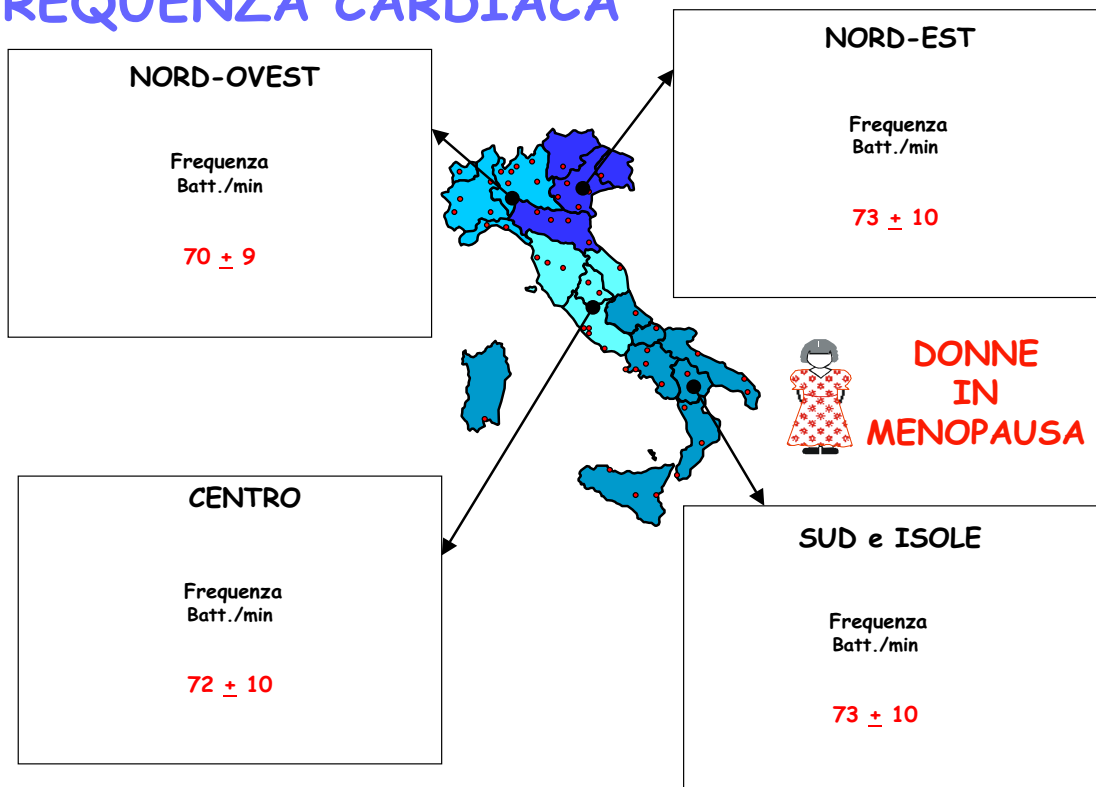
Mean levels of triglycerides and LDL cholesterol in Italian macroareas. Menopausal women.

## GLICEMIA



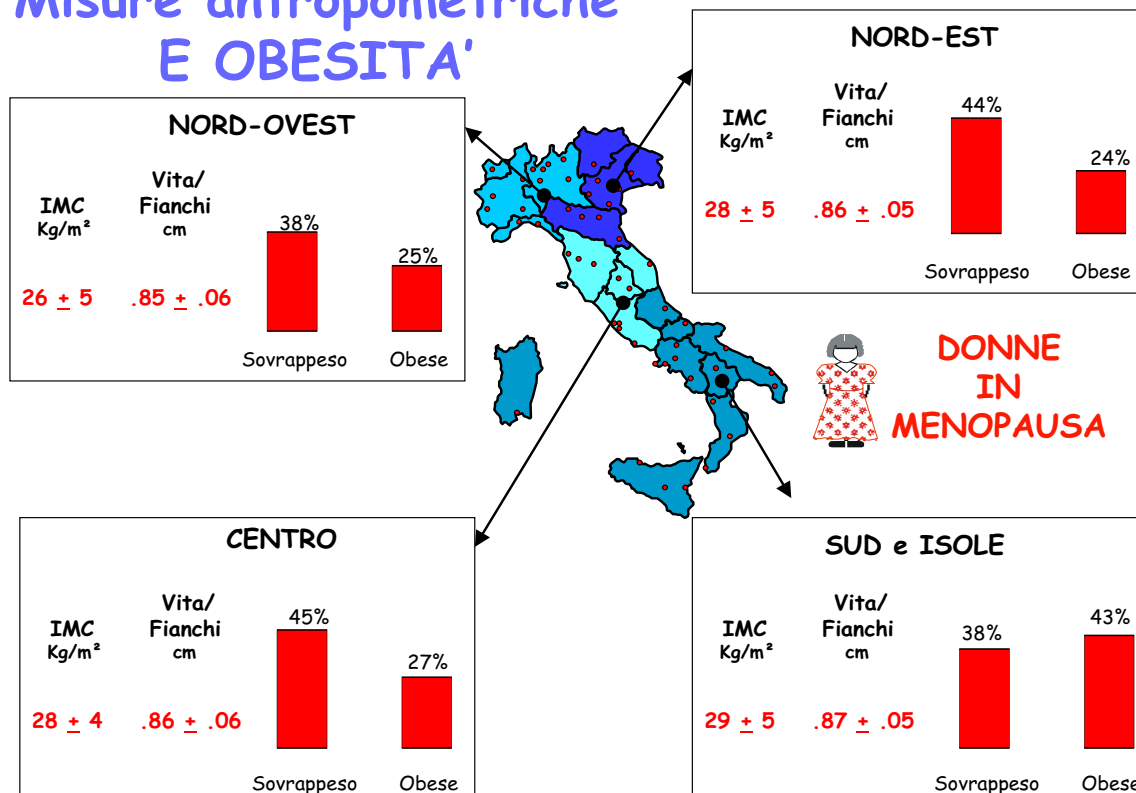
Mean levels of fasting blood glucose and prevalence of impaired glucose tolerance in Italian macroareas. Menopausal women.

## FREQUENZA CARDIACA



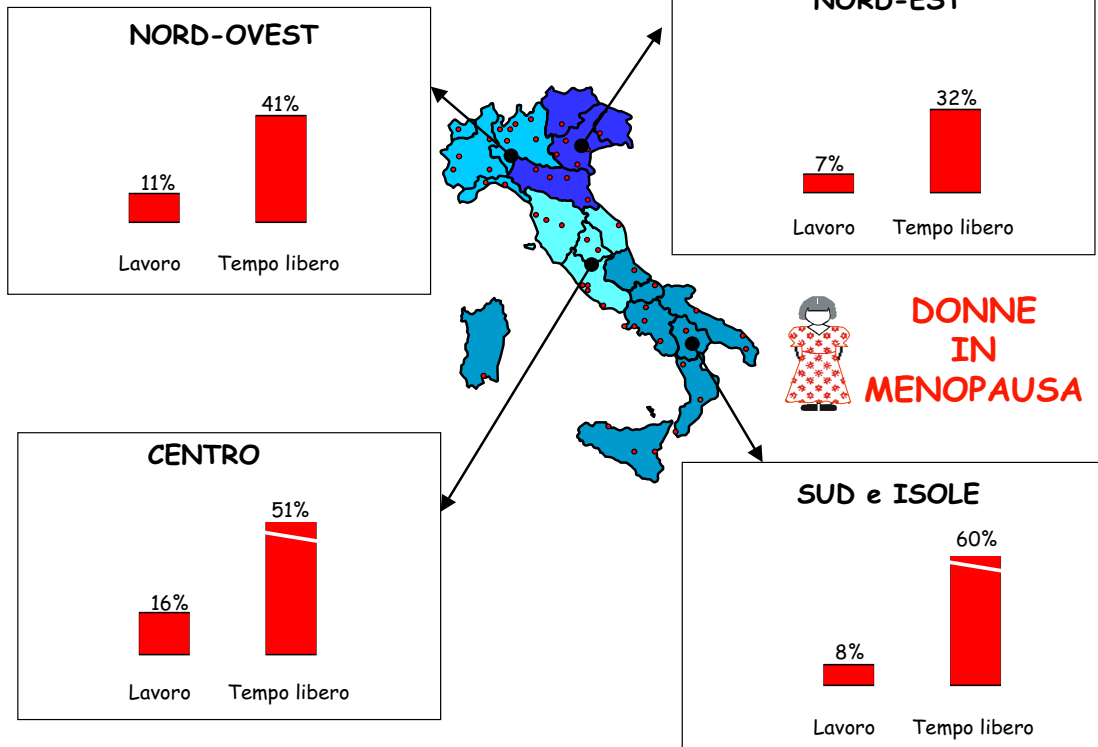
Mean levels of heart rate in Italian macroareas. Menopausal women.

## Misure antropometriche E OBESITA'



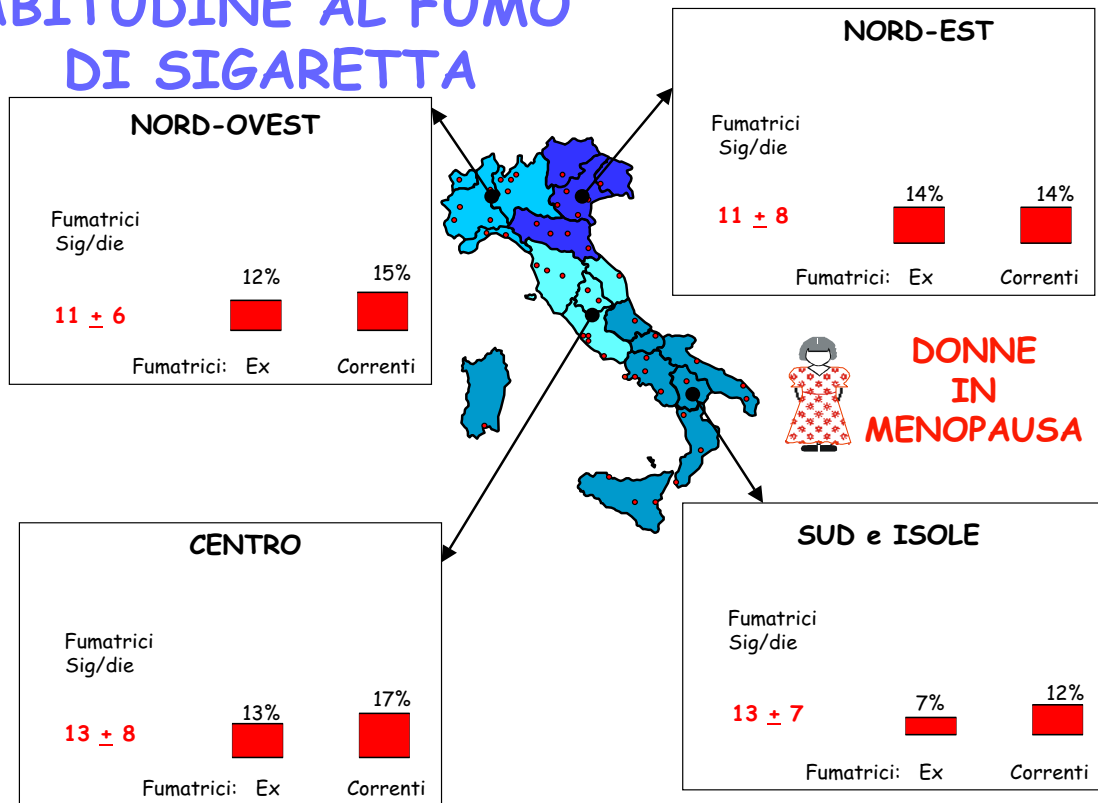
Mean levels of body mass index and prevalence of overweight and obesity in Italian macroareas. Menopausal women.

## INATTIVITA' FISICA



Prevalence of physical inactivity at work and leisure time in Italian macroareas. Menopausal women.

## ABITUDINE AL FUMO DI SIGARETTA



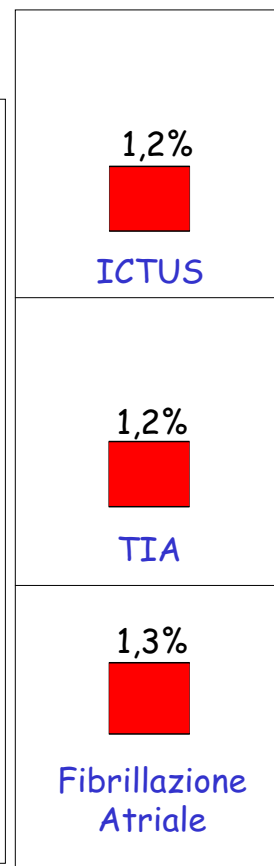
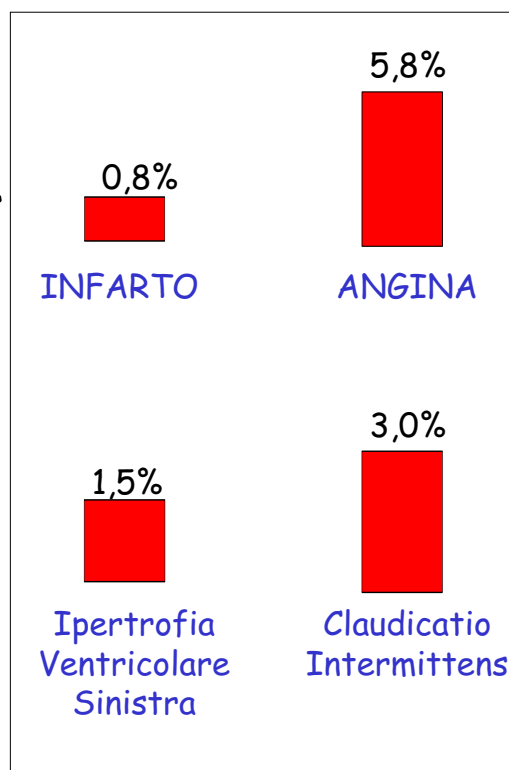
Prevalence of smoking habit and mean number of cigarettes smoked per day in smokers in Italian macroareas. Menopausal women.



# ITALIA



**DONNE  
IN  
MENOPAUSA**



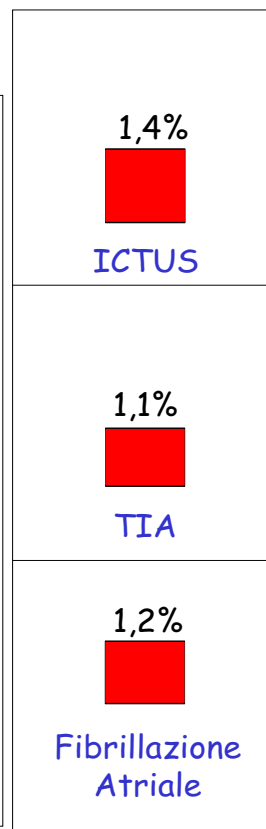
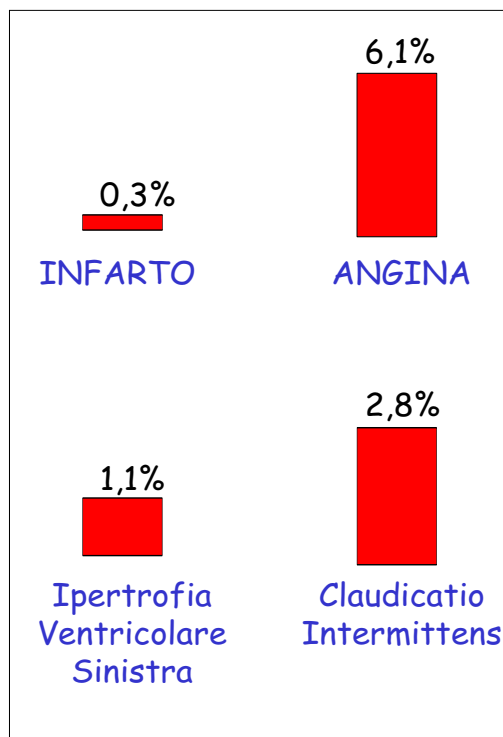
Italy. Prevalence of cardiovascular diseases: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens, stroke, TIA, atrial fibrillation. Menopausal women.



## NORD-OVEST



**DONNE  
IN  
MENOPAUSA**



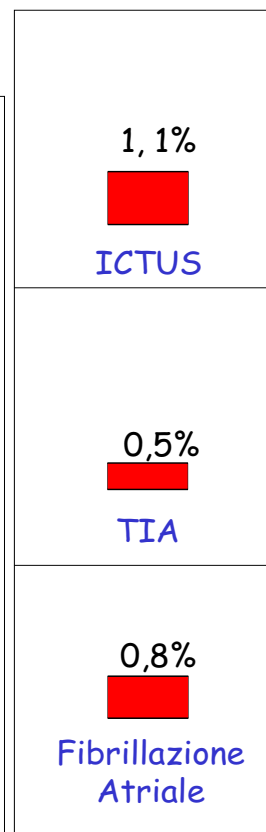
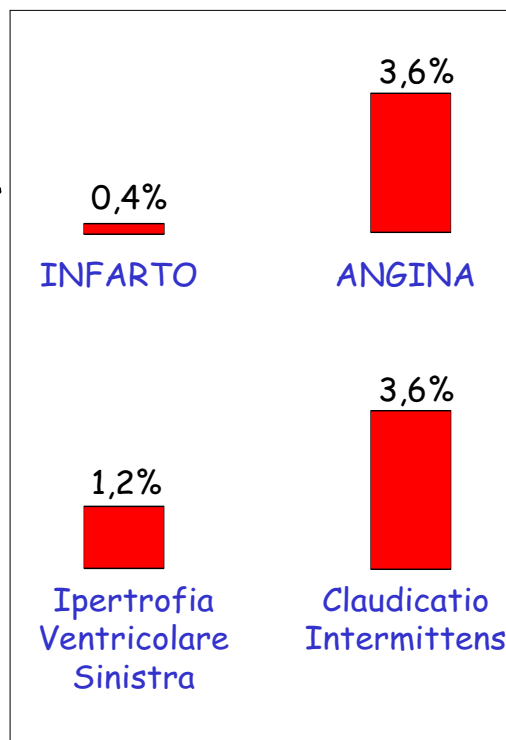
Prevalence of cardiovascular diseases in the Northwest: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens, stroke, TIA, atrial fibrillation. Menopausal women.



## NORD-EST



**DONNE  
IN  
MENOPAUSA**



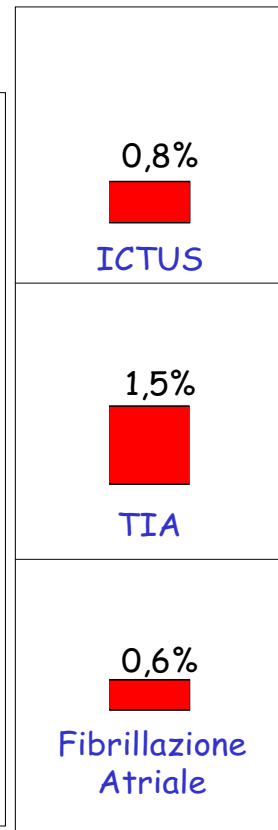
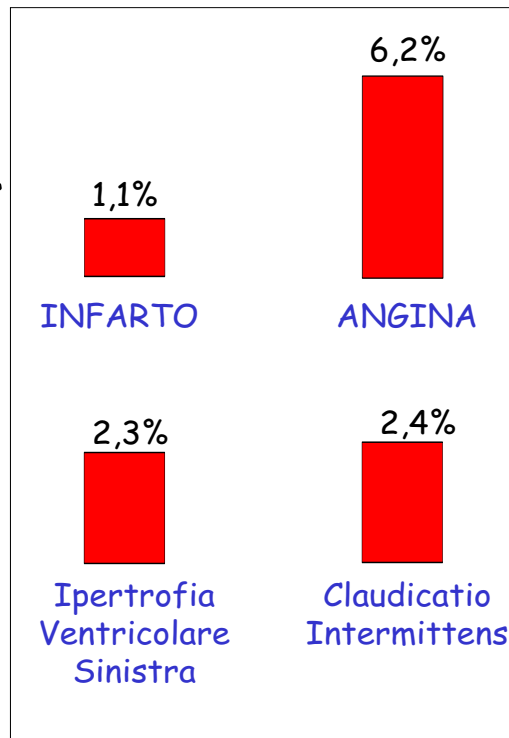
Prevalence of cardiovascular diseases in the Northeast: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens, stroke, TIA, atrial fibrillation. Menopausal women.



## CENTRO



**DONNE  
IN  
MENOPAUSA**



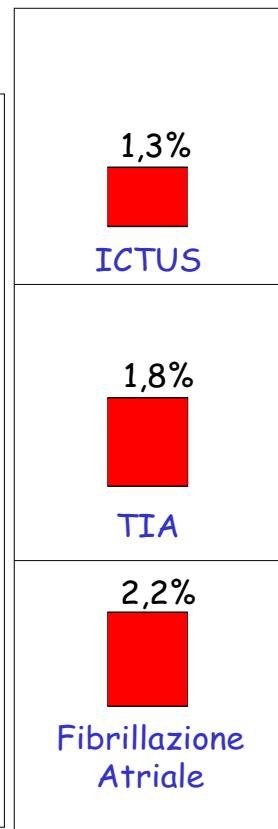
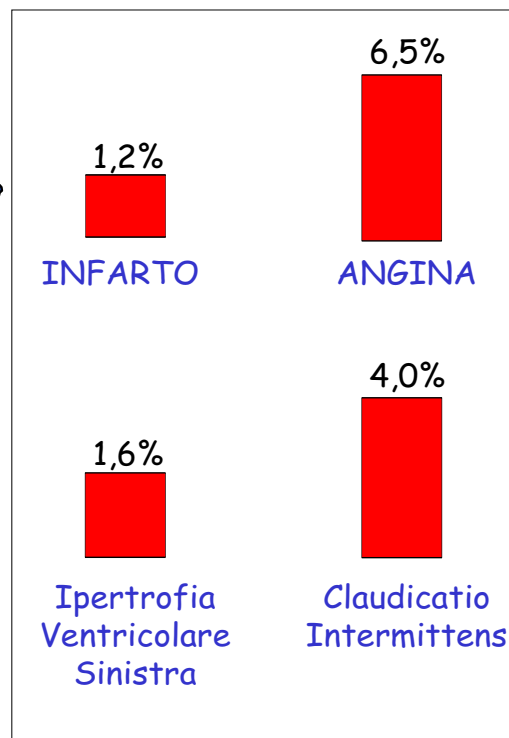
Prevalence of cardiovascular diseases in the Center: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens, stroke, TIA, atrial fibrillation. Menopausal women.



## SUD e ISOLE

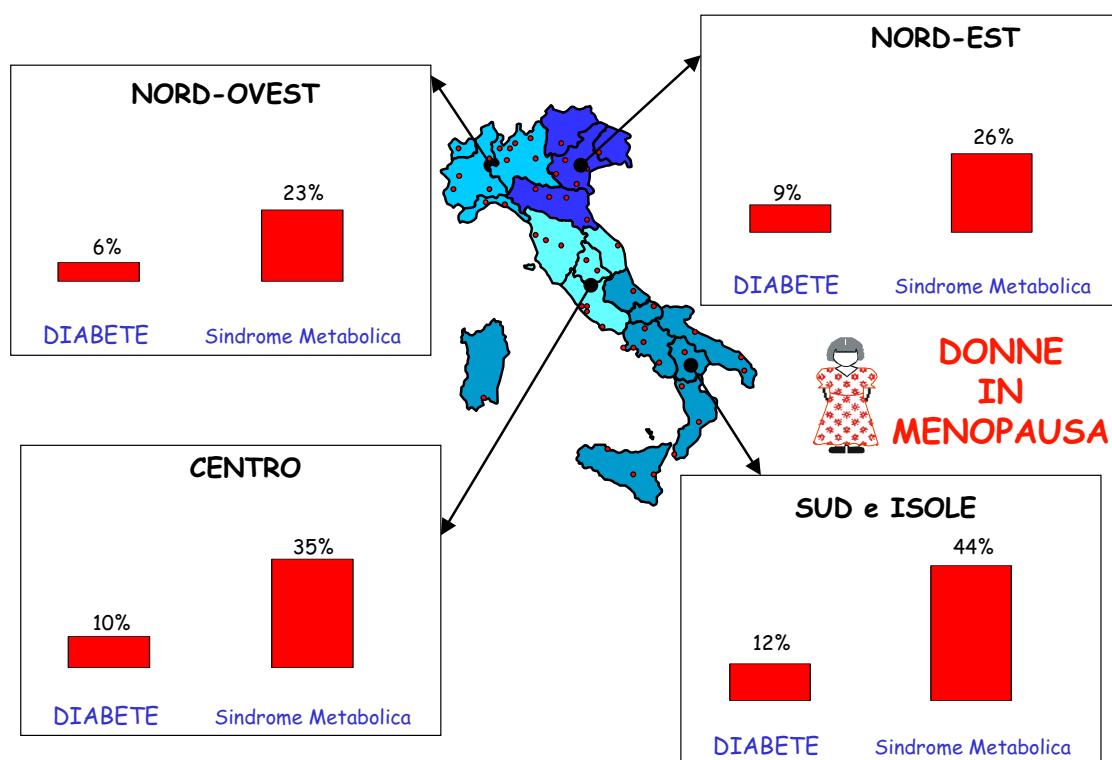


**DONNE  
IN  
MENOPAUSA**



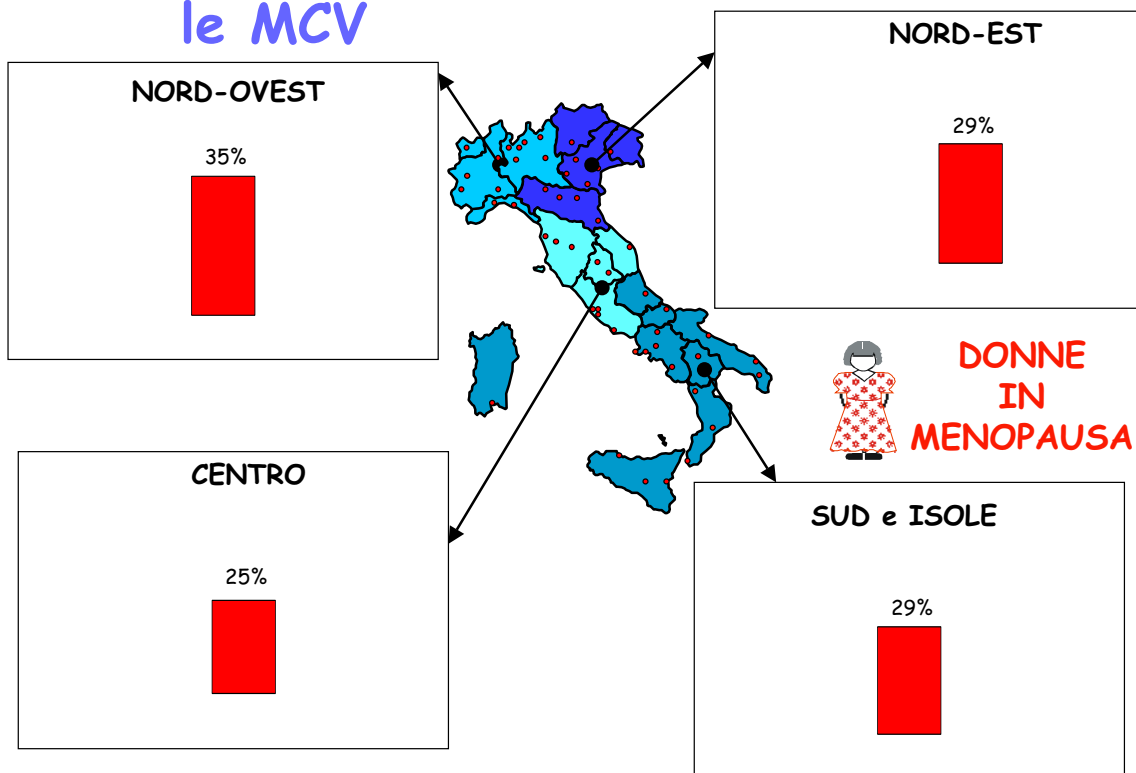
Prevalence of cardiovascular diseases in the South and Islands: myocardial infarction, angina pectoris, left ventricular hypertrophy, claudicatio intermittens, stroke, TIA, atrial fibrillation. Menopausal women.

## Diabete e Sindrome Metabolica



Prevalence of diabetes and metabolic syndrome in Italian macroareas. Menopausal women.

## Familiarità per le MCV



*Family history of cardiovascular diseases in Italian macroareas. Menopausal women.*