

*Ciclo di laboratori regionali  
Medicina di genere ed equità*

**1° laboratorio**  
**Scompenso cardiovascolare e stroke**

# STROKE IN UNA PROSPETTIVA DI GENERE

*Dott. Andrea Zini  
Direttore UOC Neurologia e Rete Stroke metropolitana  
Ospedale Maggiore  
IRCCS Istituto delle Scienze Neurologiche di Bologna*

# WOMEN STROKE association



Selezionare un'area :

Medicina di Genere



SUBMIT

**Gruppo : Medicina di Genere**  
**Coordinatore Prof.ssa Rosanna Abbate**

Paola Santalucia



Milano (Vice Coordinatore)

Monica Acciaresi



Perugia

Sabrina Anticoli



Roma

Valeria Caso



Perugia

Elisabetta Giugni



Roma

Francesca Romana Pezzella



Roma

Simona Sacco



L'Aquila

Maria Sessa



Milano

Rita Vadalà



Roma

Maria Luisa Zedde



Reggio Emilia

Marco Stramba-Badiale



Milano

Maurizio Paciaroni



Perugia

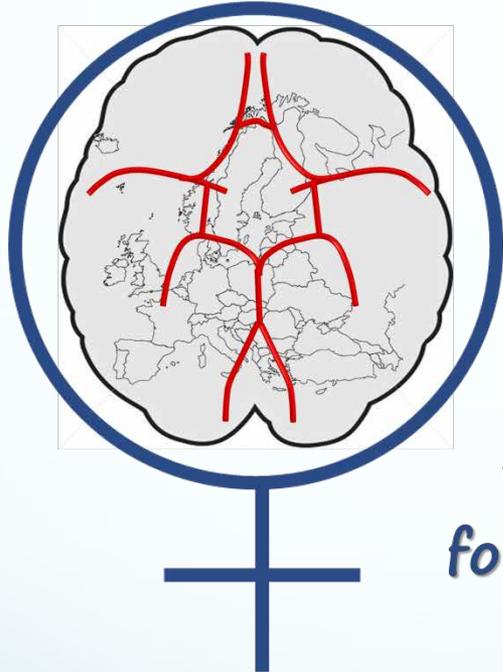
Alessandro Pezzini



Brescia



# IN EUROPA ....



## WISE

*Women Initiative  
for Stroke in Europe*

**ESO**  
EUROPEAN STROKE  
ORGANISATION

## **WISE (Women Initiative for Stroke in Europe)**

WISE – Women Initiative for Stroke in Europe ESO working Group was formally constituted in 2014.



Sex and gender differences in cardio-cerebrovascular disease represent a main scientific and social issue that deserve a dedicated attention by the scientific community. WISE in ESO could represent the ideal European context to join efforts and scientific initiatives to face this important topic. Europe is a multifaceted country, the known diversities in health-care systems, economical and social settings, and multi-ethnicity, all might affect the cardiovascular risk profile and cerebrovascular disease, translating potentially in differences in terms of outcome and social aspects gender-related, in this context,

## Women Stroke Association statement on stroke

Francesca Romana Pezzella<sup>1\*</sup>, Paola Santalucia<sup>2</sup>, Rita Vadalà<sup>3</sup>, Elisabetta Giugni<sup>4</sup>, Maria Luisa Zedde<sup>5</sup>, Maria Sessa<sup>6</sup>, Sabrina Anticoli<sup>1</sup>, and Valeria Caso<sup>7</sup> on behalf of the Women Stroke Association

**We describe the current and future objectives of the Women Stroke Association, a nonprofit multidisciplinary organization promoting research awareness on medical, psychological, and social issues concerning women affected by cerebrovascular disease. In this paper, we deal with only cerebrovascular disease, whereas cardiovascular disorders will be addressed in a future paper. Gender differences in the clinical presentation of cerebrovascular diseases have been repeatedly suggested, and some treatment options may not be as effective and safe in men and women. For many years, women have either been underrepresented or excluded from randomized clinical trials, and the majority of therapeutic research has been carried on predominantly male populations. Furthermore, gender differences have been shown to contribute to different responses to cerebrovascular drugs in women when compared with men, regarding pharmacokinetics, pharmacodynamics, and physiology. In this statement, we discuss main research fields relevant to Women Stroke Association's mission and commitment, highlighting opportunities and critical from the women's health perspective. Future directions and goals of the Women Stroke Association arise from these considerations and represent the association's commitment to combating stroke.**

Key words: epidemiology, gender medicine, methodology, risk factors, stroke, therapy

# AHA/ASA Guideline

## **Guidelines for the Prevention of Stroke in Women** **A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association**

*The American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists.  
Endorsed by the American Association of Neurological Surgeons and Congress of Neurological Surgeons*

Cheryl Bushnell, MD, MHS, FAHA, Chair; Louise D. McCullough, MD, PhD, FAHA, Vice-Chair;  
Issam A. Awad, MD, MSc; Monique V. Chireau, MD, MPH, FAHA; Wende N. Fedder, DNP, RN, FAHA;  
Karen L. Furie, MD, MPH, FAHA; Virginia J. Howard, PhD, MSPH, FAHA;  
Judith H. Lichtman, PhD, MPH; Lynda D. Lisabeth, PhD, MPH, FAHA;  
Ileana L. Piña, MD, MPH, FAHA; Mathew J. Reeves, PhD, DVM, FAHA;  
Kathryn M. Rexrode, MD, MPH; Gustavo Saposnik, MD, MSc, FAHA;  
Vineeta Singh, MD, FAHA; Amytis Towfighi, MD; Viola Vaccarino, MD, PhD;  
Matthew R. Walters, MD, MBCChB, MSc; on behalf of the American Heart Association Stroke  
Council, Council on Cardiovascular and Stroke Nursing, Council on Clinical Cardiology, Council on  
Epidemiology and Prevention, and Council for High Blood Pressure Research

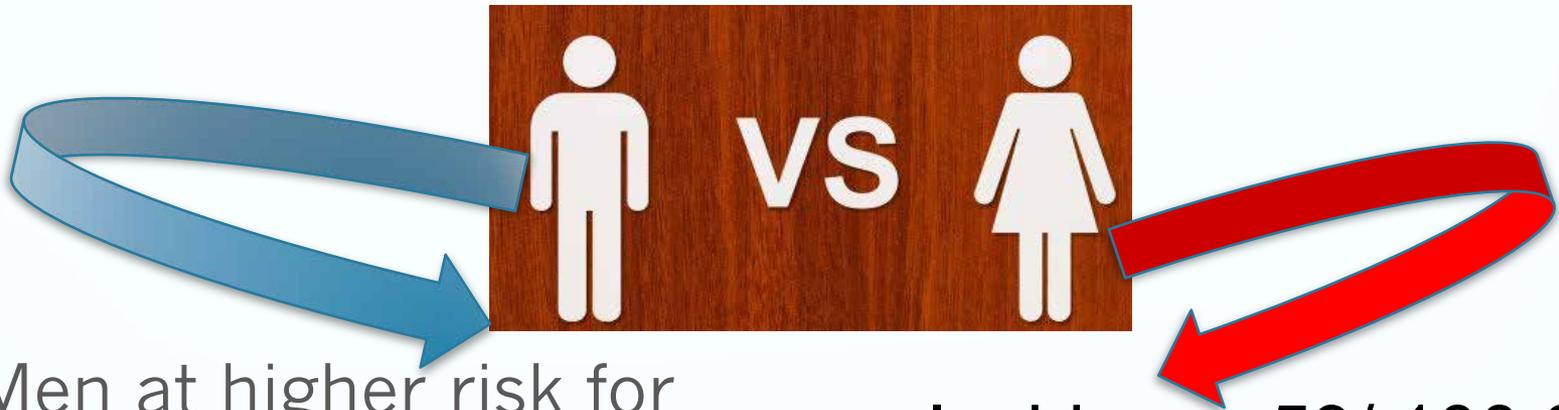
# Epidemiologia: Incidenza, Prevalenza

## AHA Statistical Update

### Heart Disease and Stroke Statistics—2015 Update A Report From the American Heart Association

- ❖ Gli uomini hanno una più alta incidenza (del 33%) di stroke delle donne (variabile per età).
  - **Ictus ischemico:** D>U per età >85 anni
  - **ICH:** D < U (lievi differenze, ma dati discordanti tra diversi studi)
  - **SAH:** D > U, soprattutto a partire dall'età di 55 anni (con > prevalenza di aneurismi intracerebrali soprattutto ACoP] e > rischio di rottura [soprattutto, in gravidanza e puerperio])
- ❖ Ma, le donne hanno una > aspettativa di vita con un rischio di stroke nel corso della vita per un'età tra i 55 e i 75 anni del 20% vs. il 17% negli uomini
- ❖ Età media al primo stroke: 73 D vs. 68.6 U; Gravità stroke: D > U (**Appelros et al, 2009**)

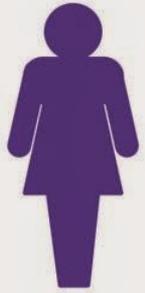
# Stroke- incidence and mortality



- Men at higher risk for stroke than women
- Incidence- 62.8/ 100,000
- Mortality- 26.3%

- Incidence 59/ 100,000
- Mortality- 39.2%

World Health Organization



1 in 5 women

and



1 in 6 men

will have a stroke by the age of 75.



©NSF-Australia

# "I am Woman"

**Emma**

Stroke Survivor

"Stroke does happen to young people – it needs to be spoken about."

Stroke affects me.



# "I am Woman"

**Amy**

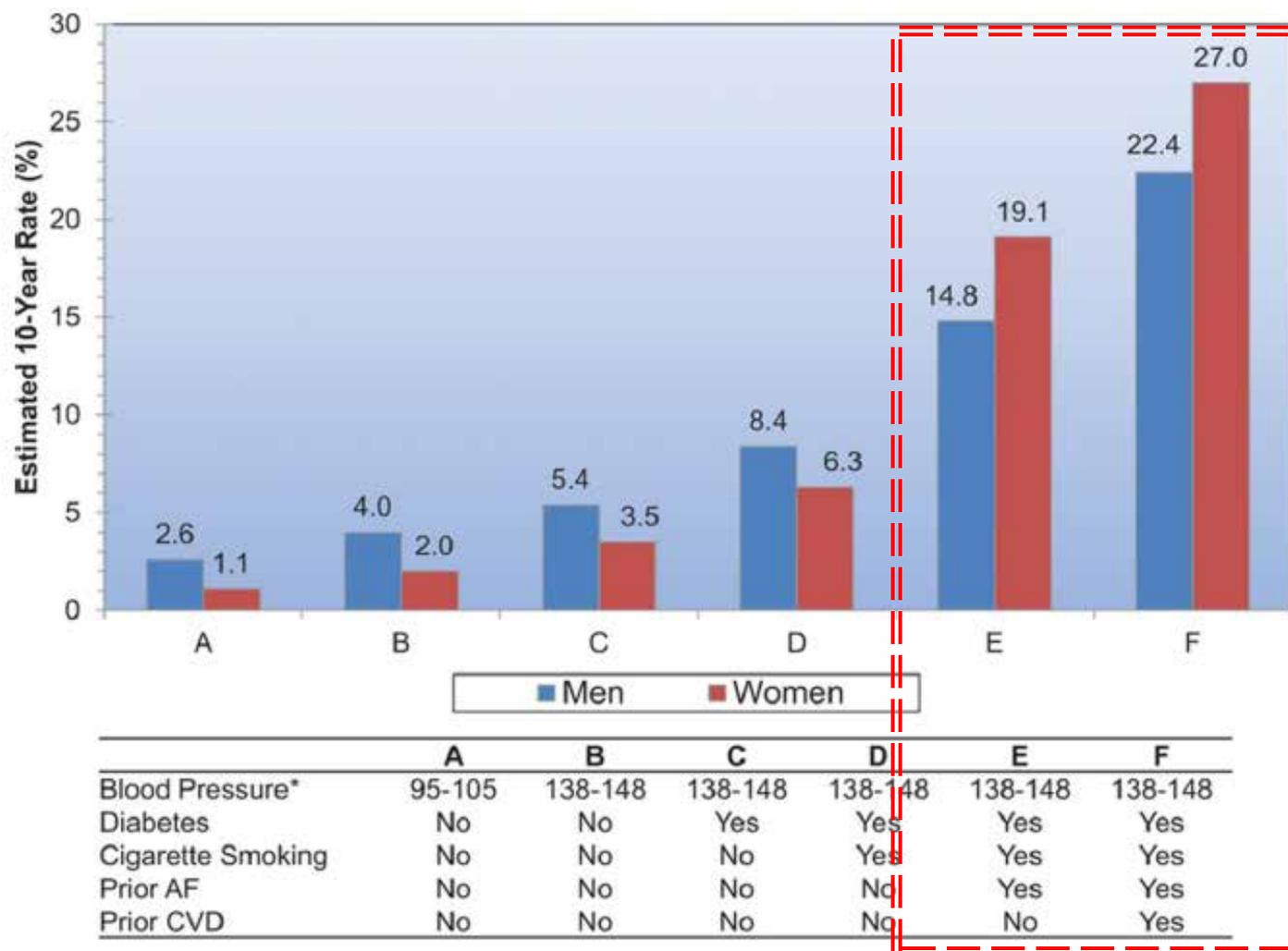
Stroke Survivor

"As a young stroke survivor, my stroke left me determined to change the way others view stroke and its survivorship to enrich our lives"

Stroke affects me.

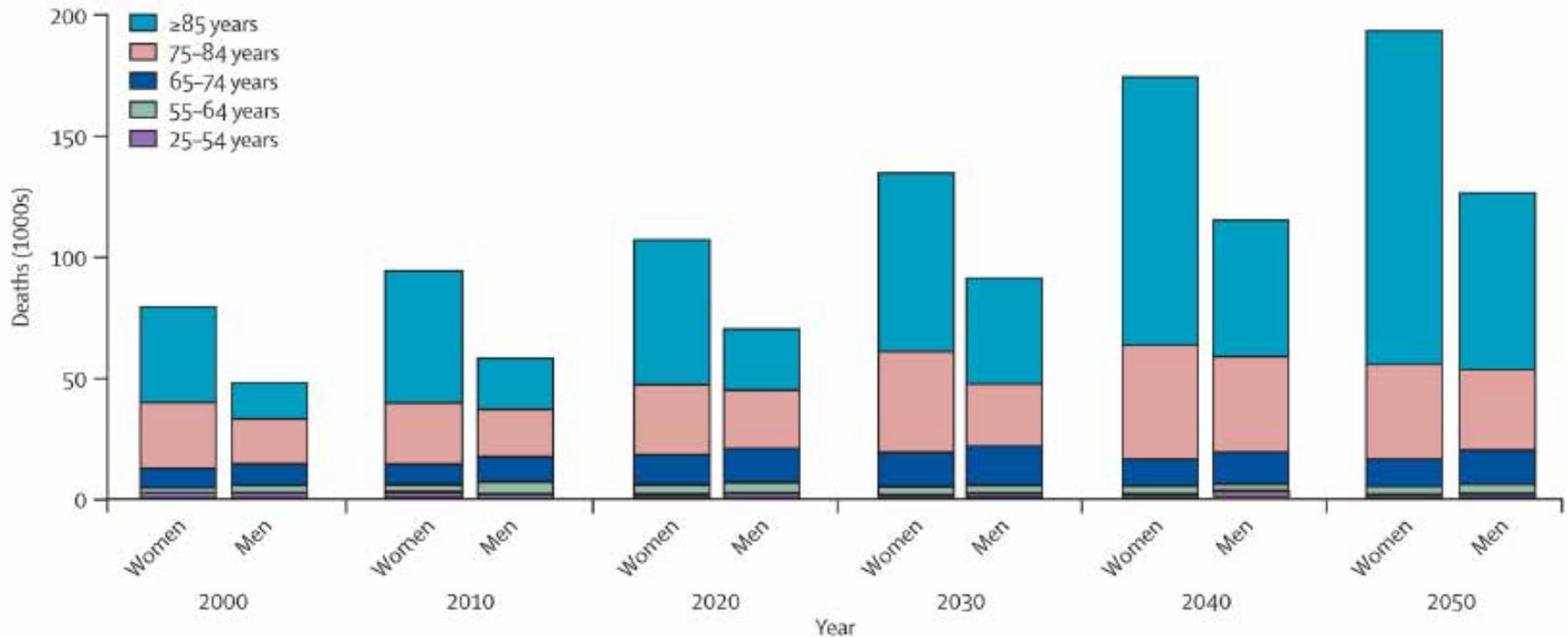


## Estimated 10-year stroke risk in adults 55 years of age according to levels of various risk factors (Framingham Heart Study).



\* - Closest ranges for women are : 95-104 and 115-124.

# Epidemiologia: Proiezioni



## ❖ Proiezioni al 2050:

- 198000 eventi di stroke nelle donne vs. 129000 negli uomini
- un eccesso di 68000 morti per stroke nelle donne

# Causes of Death by Gender in the European Countries

Men

Women

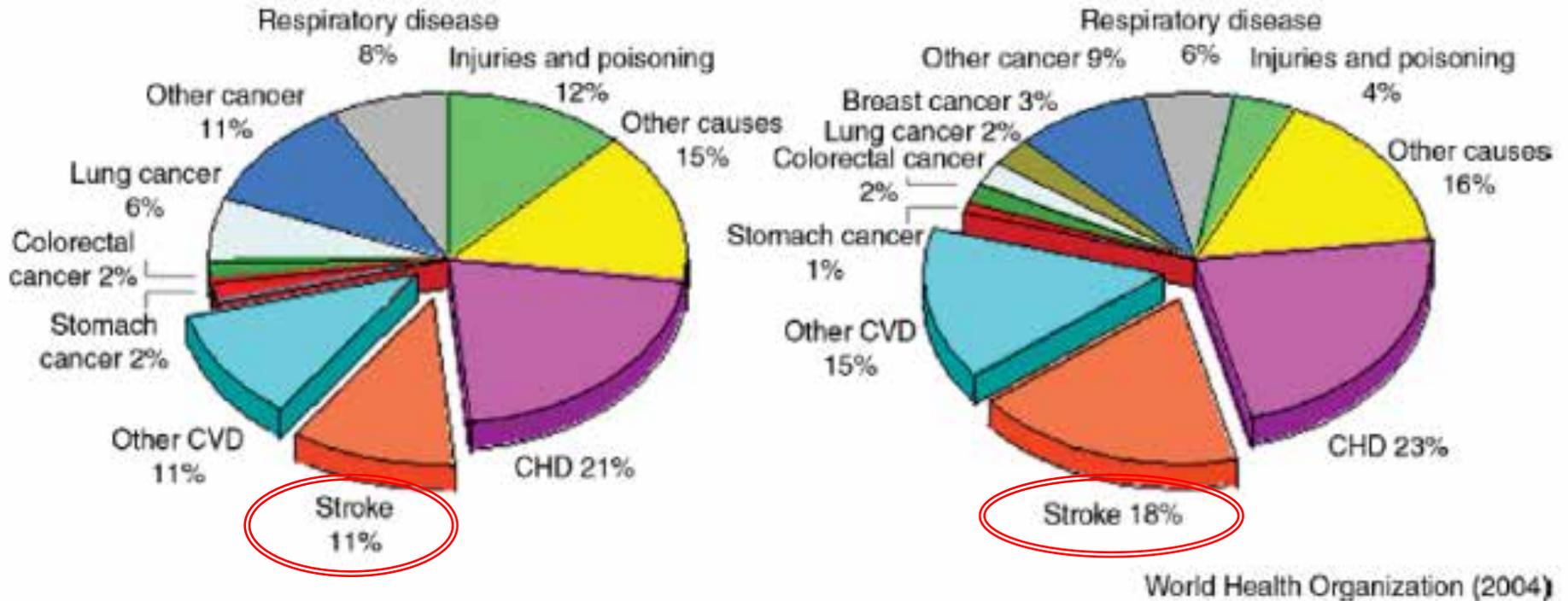


Figure 1 Causes of death in Europe. WHO, World Health Organization.

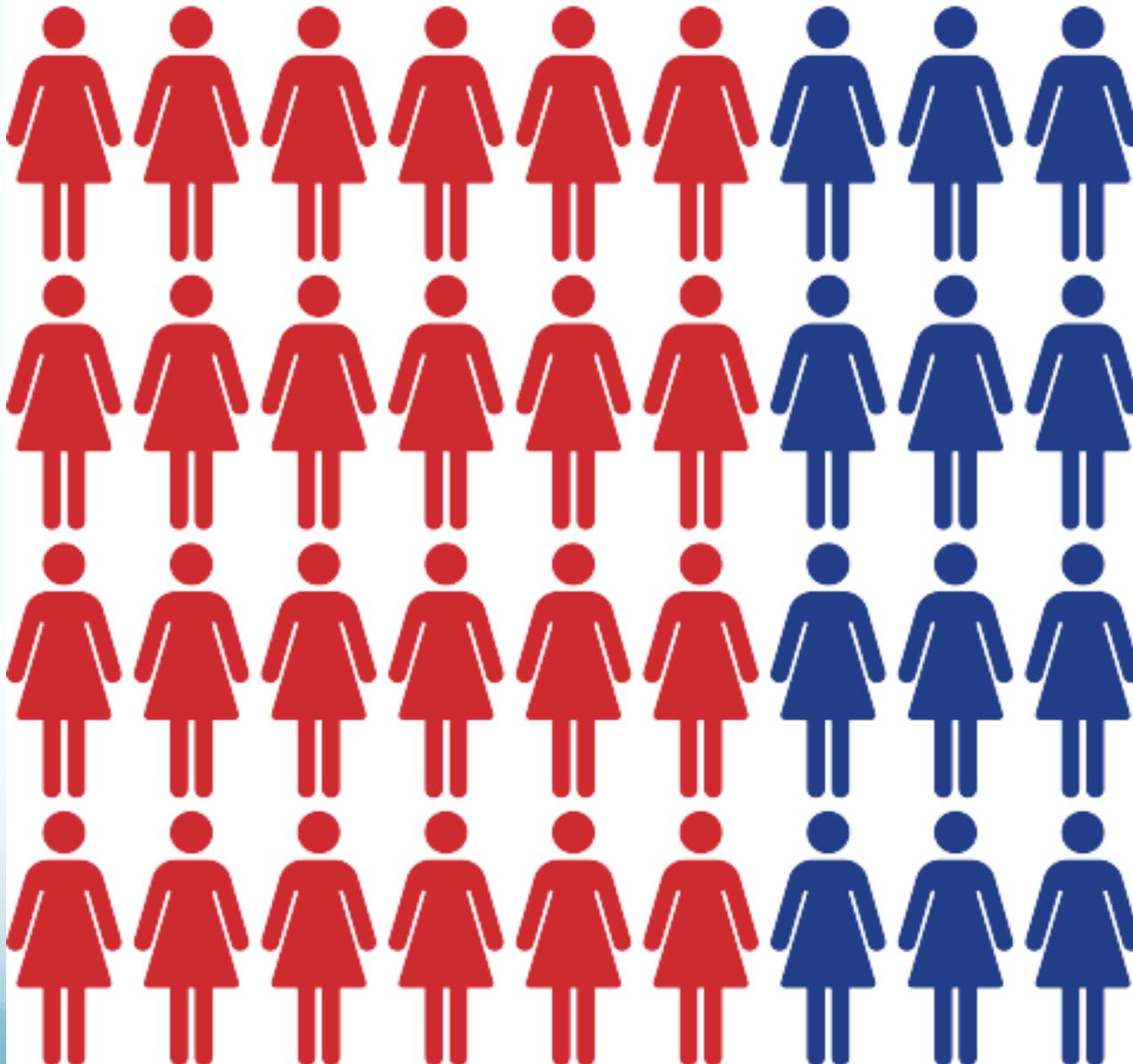
# Cause di morte anno 2013

cause	maschi	2013 femmine	totale
tumori maligni	94445	73692	168137
malattie del sistema circolatorio	97251	125073	222324
malattie ischemiche del cuore	36695	34877	71572
<b>malattie cerebrovascolari</b>	23140	<b>35233</b>	58373

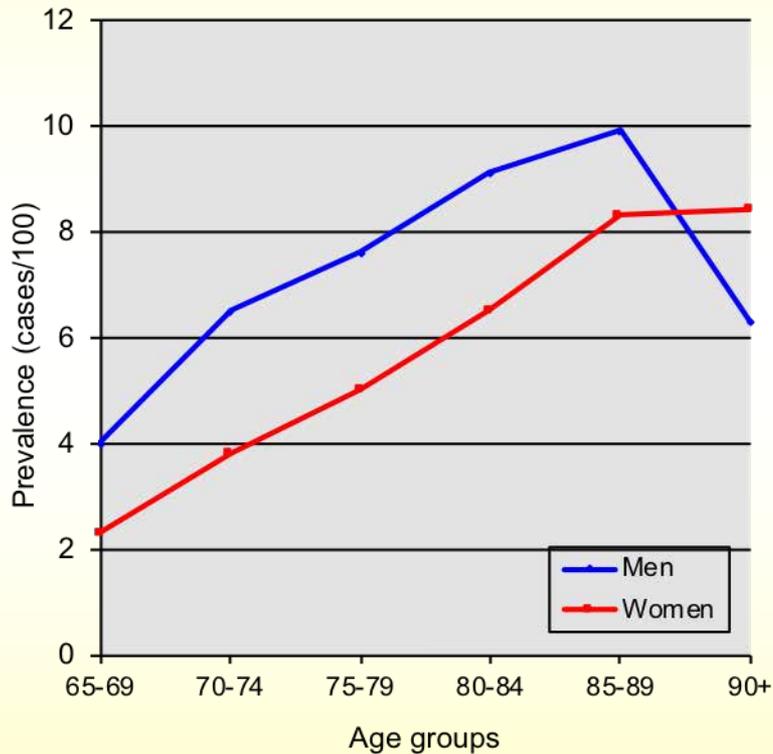


**Female deaths per year from stroke**

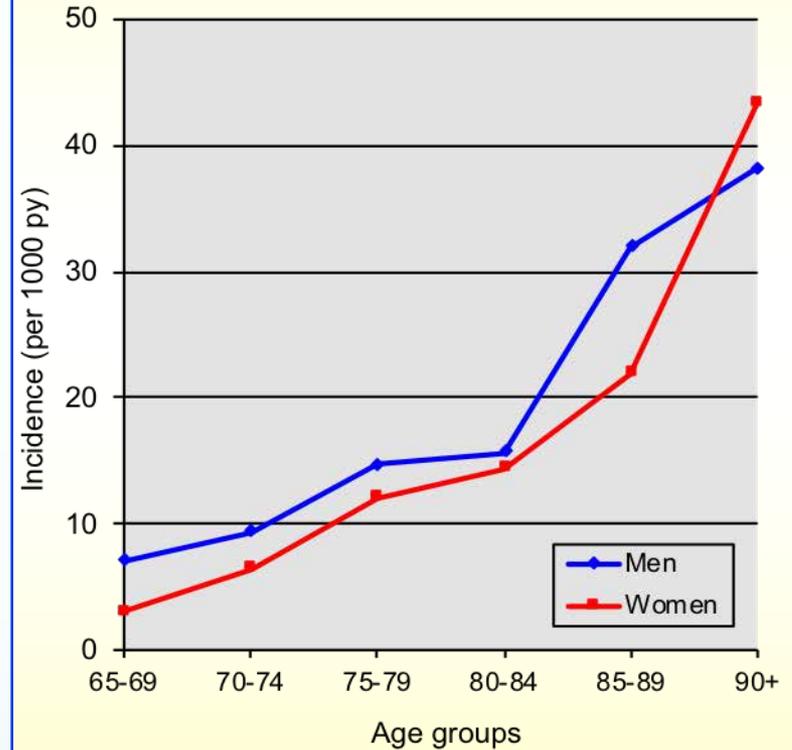
**Breast cancer**



## Stroke prevalence in Europe



## Incidence of first-ever stroke in Europe



**Prevalent cases**

**2 700 000**

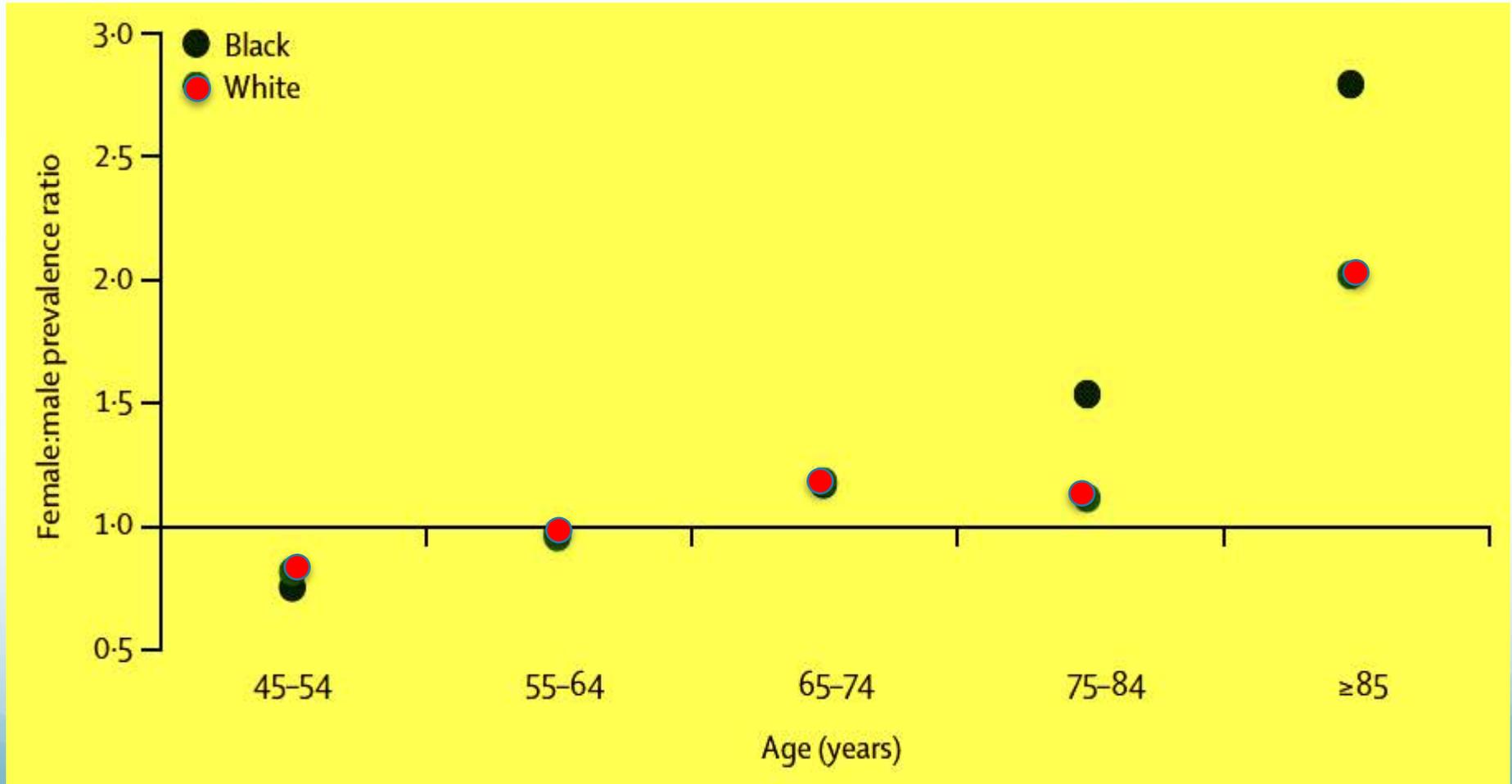
**M: 1 250 000 W: 1 450 000**

**Incident cases**

**536 000**

**M: 251 000 W: 285 000**

# Female/male prevalence ratios for stroke by age



# Stroke in women, a major social impact

- L'ictus nella donna è più grave e con un impatto funzionale peggiore
    - mortalità a 1 mese: 24.7% (19.7% nell'uomo) (*Stroke* 2009)
    - maggiore dipendenza fisica e cognitiva
    - maggiori limitazioni nella ADL
    - maggiore depressione
      - => peggiore qualità di vita
  - Outcome e QOL peggiori persistono persino dopo correzione per età, gravità, disabilità pre Stroke, ecc
  - Maggiore isolamento sociale
- negli USA 8 milioni di donne vs 2.7 milioni di uomini vivono da sole
- Maggiore probabilità di istituzionalizzazione

RR 3.5 (Framingham, 56 aa follow up)

(*Stroke* 2009;40:1032)



# Fattori di rischio

## AHA/ASA Guideline

### Guidelines for the Prevention of Stroke in Women A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association

Comuni a Uomini e Donne	Specifici o più prevalenti nelle Donne
<ul style="list-style-type: none"><li>• Età</li><li>• Ipertensione</li><li>• Pregresso stroke/TIA</li><li>• Diabete</li><li>• Fumo di sigaretta</li><li>• Pregresso evento cardiovascolare</li><li>• Dislipidemia</li><li>• Dieta/Inattività fisica</li><li>• Sindrome metabolica</li></ul>	<ul style="list-style-type: none"><li>• Gravidanza/Preeclampsia</li><li>• Contraccettivi orali</li><li>• Terapia ormonale sostitutiva</li><li>• Diabete gestazionale</li><li>• Emicrania con aura</li><li>• Fibrillazione atriale</li><li>• Depressione e stress psico-sociale</li></ul>

# Fattori di rischio: gravidanza

**Table 1** Risk factors and comorbidities for stroke during pregnancy

Nonmodifiable risk factors	<ul style="list-style-type: none"> <li>Age (age &gt;35 years)</li> <li>Race-ethnicity               <ul style="list-style-type: none"> <li>Asian race for hemorrhagic stroke</li> <li>Black race for thromboembolism</li> </ul> </li> </ul>
Modifiable risk factors	<ul style="list-style-type: none"> <li>Obesity</li> <li>Substance use: tobacco, alcohol, recreational drugs, particularly cocaine</li> </ul>
Complications/comorbidities	<ul style="list-style-type: none"> <li>Pregnancy-specific disorders:               <ul style="list-style-type: none"> <li>Preeclampsia</li> <li>Peripartum cardiomyopathy</li> <li>Amniotic fluid embolism</li> <li>Choriocarcinoma</li> </ul> </li> <li>Hypertension</li> <li>Gestational diabetes</li> <li>Peripartum migraine</li> <li>Hematologic disorders:               <ul style="list-style-type: none"> <li>Thrombophilia</li> <li>Lupus</li> <li>Heart disease</li> <li>Sickle cell disease</li> </ul> </li> <li>Rheumatic fever and valvular heart disease</li> <li>Patent foramen ovale/pulmonary arteriovenous malformation</li> <li>Particulars of pregnancy:               <ul style="list-style-type: none"> <li>Cesarian delivery</li> <li>Multiparity</li> <li>Multiple gestation</li> </ul> </li> <li>Complications               <ul style="list-style-type: none"> <li>Traumatic cervical artery dissection</li> <li>Postpartum infection</li> <li>Disseminated intravascular coagulation</li> <li>Fluid and electrolyte imbalance, and acid-base disorder</li> <li>Transfusion</li> </ul> </li> </ul>

# Fattori di rischio prevalenti nelle donne

## Meta-analysis evaluating risk factor differences between men and women with IS

	Number of studies	Women, n (% of total)	Men, n (% of total)	OR (95% CI)	p-value
Hypertension	33	214,728 (69)	187,858 (65)	1.15 (1.07-1.24)	<0.001
AF	29	55,954 (19)	40,556 (15)	1.31 (1.21-1.43)	<0.001
Hyperlipidemia	19	76,623 (34)	75,462 (37)	0.90 (0.82-0.99)	0.033



# I classici fattori di rischio vascolari sono simili in entrambi i sessi, ma differiscono in prevalenza

*Mosca et al Sex/gender differences in CVD prevention, Circulation 2011;124:2145-54*

- **Fattori di rischio con maggiore prevalenza nelle donne (USA)**

- Ipertensione arteriosa > 65 aa
- Diabete: 8.3% vs 7.2%  $\geq$  20 aa
- Colesterolo totale  $\geq$  240 mg/ dL : 16.2% vs 13.5%  $\geq$ 20 aa
- Inattività fisica: 34.5% vs 30.3%
- Eemicrania 3/1 (emicrania con aura)

- **Fattori di rischio con maggiore prevalenza negli uomini (USA)**

- Fumo di sigaretta e consumo di alcool: 23.1% vs 18.1%
- Obesità e sovrappeso: 72% vs 64%

- **Aderenza ai tre principali comportamenti suggeriti per modificare lo stile di vita**

(no smoking, physical activity, fruit and vegetable intake)

**bassa in entrambi i sessi ma maggiore del 50% nelle donne**



# Risk factor modification with proven (RCT) benefit in secondary stroke prevention in both sexes

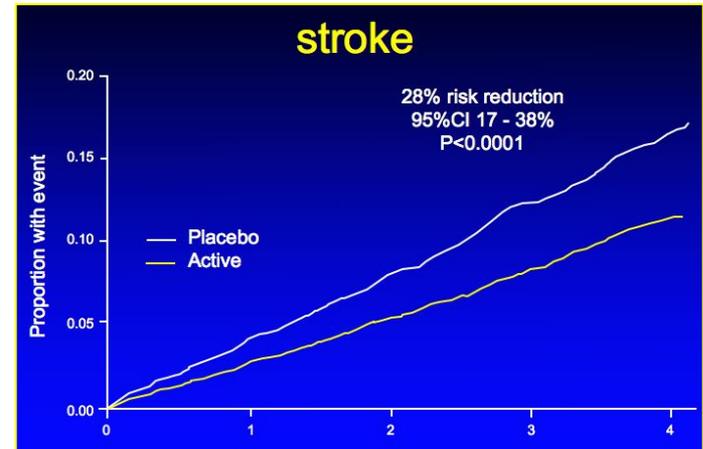
- **Blood pressure lowering: PROGRESS (Women: 30%)**

Perindopril ± Indapamide

BP reduction: 9/4 mmHg in 4 years

=> **28% stroke risk reduction**

24% ischemic stroke, 50% hemorrhagic



- **Cholesterol lowering: SPARCL (Women: 40%)**

Atorvastatin 80 vs placebo

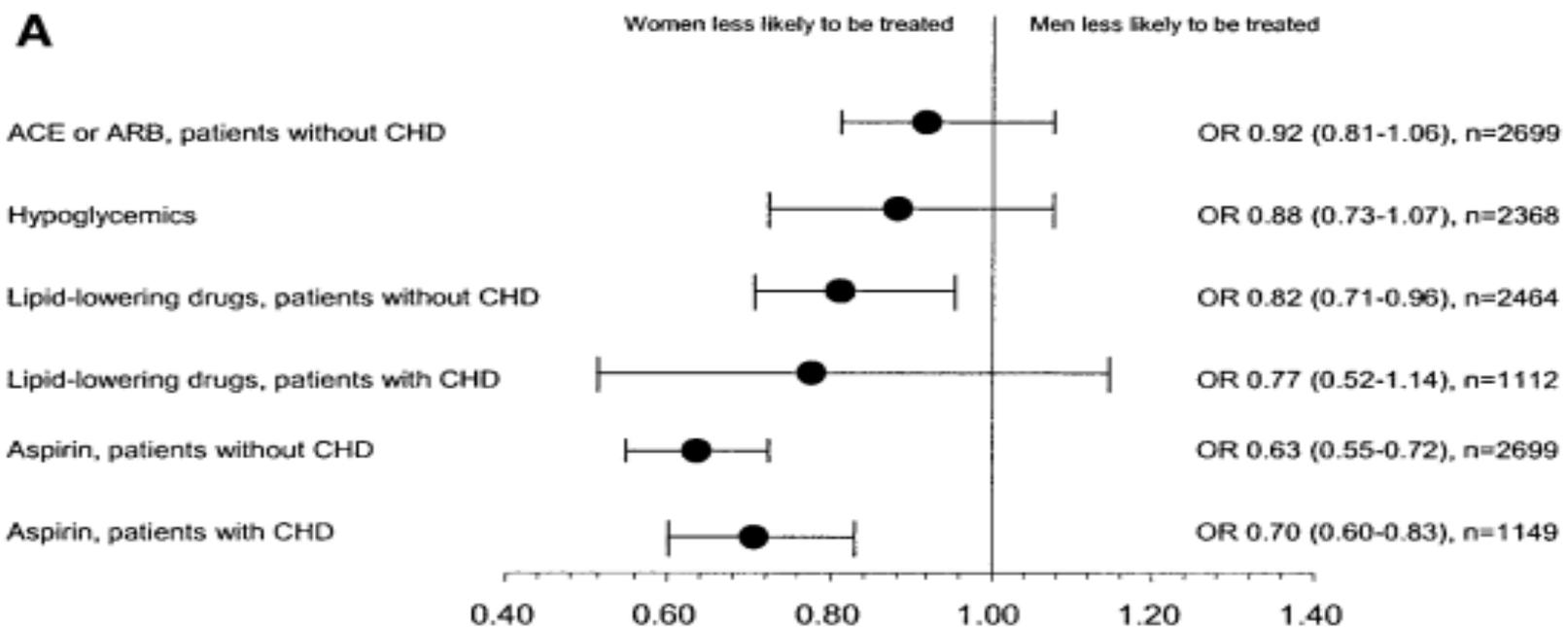
4731 patients ischemic stroke and LDL-CT: 2.6-4.9 mmol/L

> 4.9 years => LDL-CT: Atorvastatine: 1.9, placebo: 3.3 mmol/L

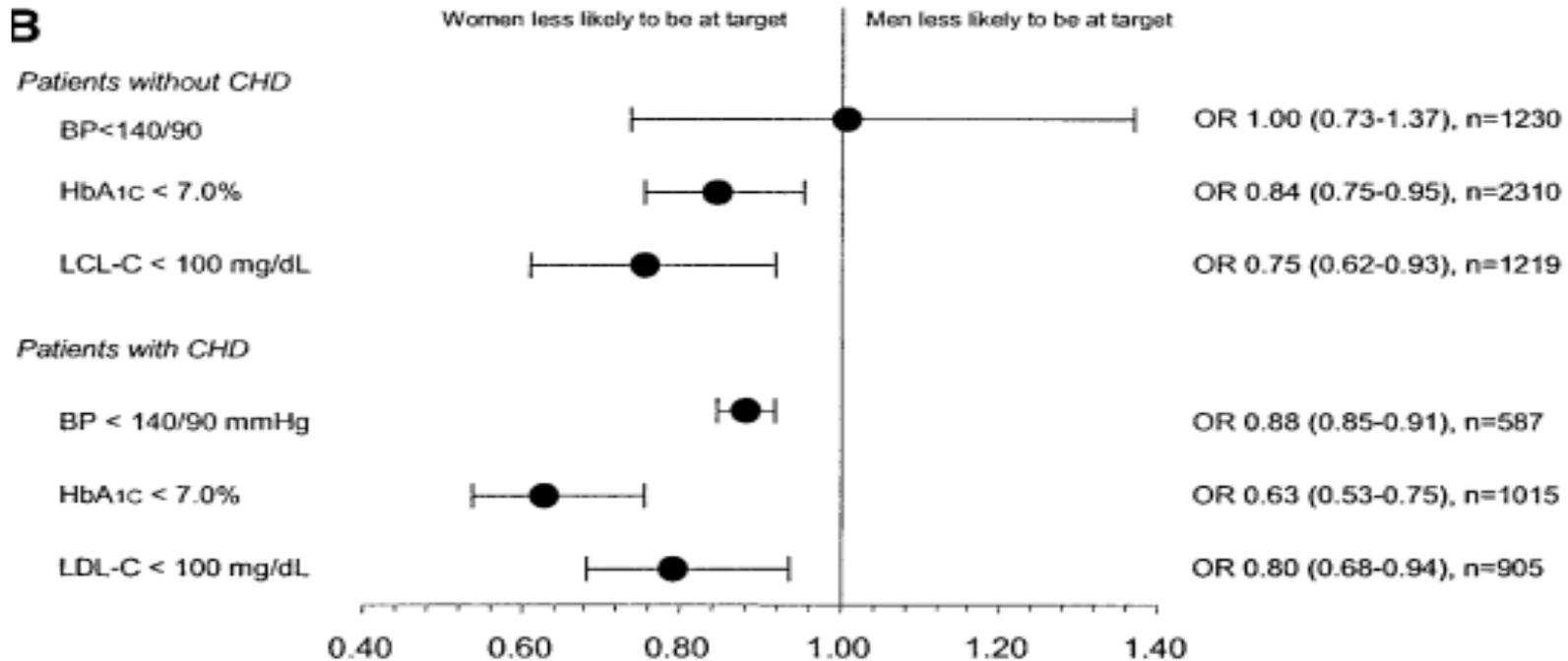


***La popolazione femminile è sottorappresentata nei trial clinici e negli studi osservazionali sullo stroke pur rappresentando la categoria a maggior rischio***

# Le donne diabetiche hanno minor probabilità di ricevere trattamento ottimale

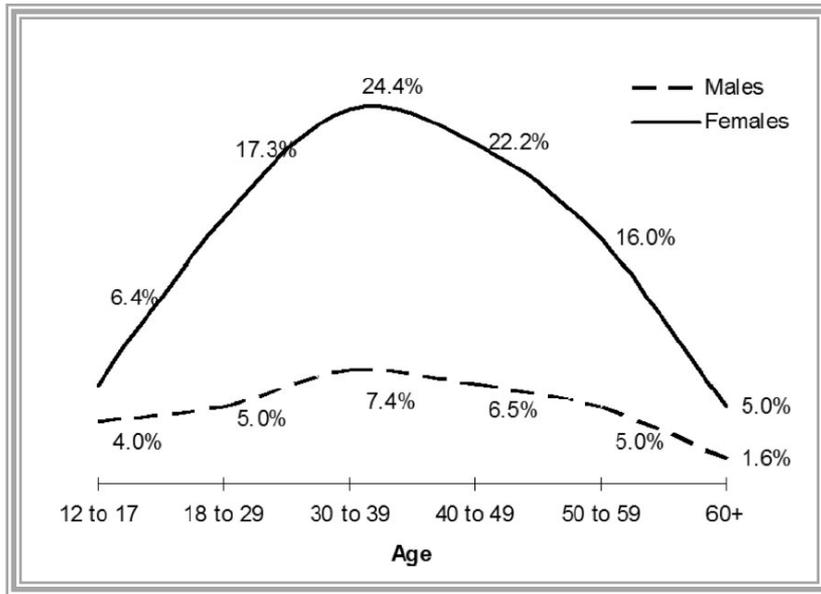


Le donne diabetiche hanno una minore probabilità di raggiungere il valore ottimale dei fattori di rischio



# Eemicrania e stroke

*Prevalence of migraine by age and gender*



*Neurology 2007;68:343–349*

*Incidence of stroke by age and gender*



*L'Aquila Stroke Registry*

# Relazioni fra emicrania e stroke

Type	Definition
Migraine as a risk factor for stroke	A clearly clinically defined stroke syndrome must occur remotely in time from a typical attack of migraine
Migraine caused by stroke (symptomatic migraine)	An acute vascular event in the central nervous system (ischemic or hemorrhagic stroke or TIA) produces episodes of headache with the characteristics of migraine with or without aura; to be coded as ICHD-II 6.1
Migraine as a cause of stroke (migrainous infarction)	A documented infarct in a relevant area during the course of an attack of migraine with aura, in a patient with a history of migraine with aura, with symptoms that are those of the aura and in the absence of other possible causes at an extensive workup; to be coded as ICHD-II 1.5.4
Migraine and stroke sharing a common cause	A syndrome (usually of genetic origin) in which both migraine and stroke are major clinical features (e.g. CADASIL [ICHD-II 6.7.1] or MELAS [ICHD-II 6.7.2])
Migraine associated with subclinical stroke	Evidence at brain neuroimaging of small areas compatible with brain ischemia in patients without a history of any clinical symptom indicating a stroke syndrome
Migraine mimicking stroke (and viceversa: stroke mimicking migraine)	Symptoms of migraine attacks (particularly aura without headache) and of stroke (particularly TIAs) may overlap causing problems in the differential diagnosis

*TIA* transient ischemic attack, *ICHD-II* International Classification of Headache Disorders, Second Edition; *CADASIL* Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leucoencephalopathy; *MELAS* Mitochondrial Encephalopathy, Lactic Acidosis and Stroke-like episodes

Natural menopause or ovarian conservation

Perimenopause

Postmenopause

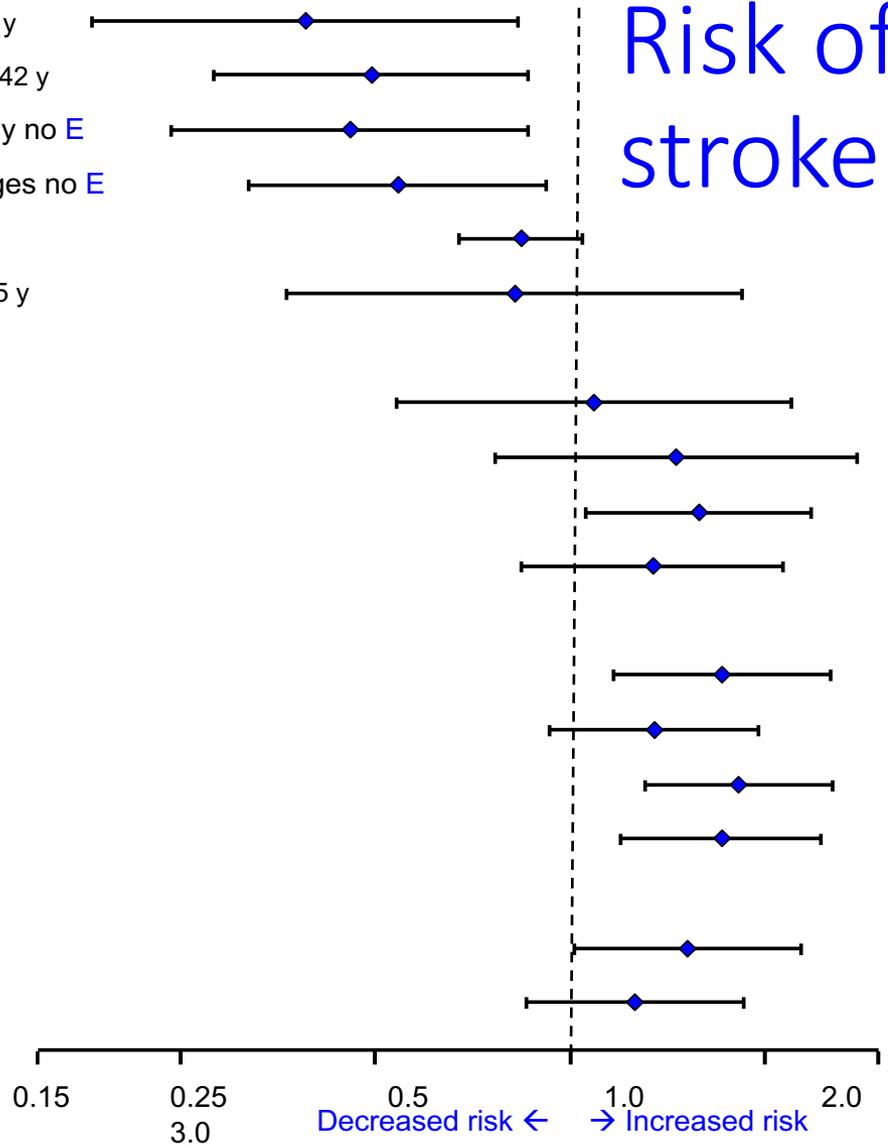
Japanese Study, menopause 50-54 vs.  $\leq 40$  y  
 Framingham, natural menopause  $\geq 42$  vs.  $< 42$  y  
 NHS, conserved ovaries vs. ooph.,  $< 50$  y no E  
 NHS, conserved ovaries vs. ooph., all ages no E  
 NHS, conserved ovaries to  $\geq 45$  y  
 Mayo Clinic Study, conserved ovaries to  $\geq 45$  y

WHI, E, 50-59 y  
 WHI, E+P, 50-59 y  
 NHS, E, 50-59 y  
 NHS, E+P, 50-59 y

WHI, E, 60-69 y  
 WHI, E+P, 60-69 y  
 NHS, E,  $\geq 60$  y  
 NHS, E+P,  $\geq 60$  y

WHI, E, 70-79 y  
 WHI, E+P, 70-79 y

# Risk of stroke



WHI = Women's Health Initiative  
 NHS = Nurses' Health Study

# WHI: Estrogen plus progestin ages 50-79 y (2003)

Stroke, all types                      HR = 1.3 (1.0 – 1.7)

**Stroke, ischemic                      HR = 1.4 (1.1 – 1.9)**

Stroke, hemorrhagic                  HR = 0.8 (0.4 – 1.6)

## Consistent findings in:

- All age groups and all times since menopause
- All categories of baseline stroke risk
- Independent of hypertension, prior CVD, and use of hormones, statins, or aspirin
- Other risk factors for stroke did not modify the effects

# WHI: Estrogen alone ages 50-79 y (2006)

Stroke, all types                      HR = 1.4 (1.1 – 1.7)

**Stroke, ischemic                      HR = 1.6 (1.2 – 2.0)**

Stroke, hemorrhagic                  HR = 0.6 (0.4 – 1.2)

Consistent findings in:

- All age groups and all times since menopause
- All categories of baseline stroke risk
- Independent of use of statins or aspirin

**Table 8. Odds of Ischemic Stroke With the Presence of Genetic or Acquired Prothrombotic Factors With and Without OC Use in the RATIO Cohort**

Study	Case/Control, n	Biomarker (Genetic or Acquired)	Adjusted OR (95% CI)	
			Non-OC Users	OC Users
Slooter et al <sup>225</sup>	193/767	FVL	0.4 (0.1–1.9)*	11.2 (4.3–29.0)*
		MTHFR 677TT	1.1 (0.5–2.4)*	5.4 (2.4–12.0)*
Pruissen et al <sup>226</sup>	190/767	FXIII Tyr204Phe	8.8 (4.3–18)†	20 (9–46)†
Urbanus et al <sup>227</sup>	175/628	Lupus anticoagulant (Ratio <sub>s/c</sub> ≥1.15)	33.6 (6.8–167)*	201.0 (22.1–1828.0)*
Andersson et al <sup>228</sup>	175/638	vWF >90th percentile	1.6 (0.8–3.5)‡	11.4 (5.2–25.3)‡
		ADAMTS13 ≤10th percentile	1.8 (0.8–4.3)‡	5.1 (2.4–11.2)‡

ADAMTS13 indicates a disintegrin and metalloproteinase with the thrombospondin type I repeat 13; CI, confidence interval; FVL, factor V Leiden mutation; FXIII, factor XIII; MTHFR, methylenetetrahydrofolate reductase; OC, oral contraceptive; OR, odds ratio; RATIO, Risk of Arterial Thrombosis in Relation to Oral Contraceptives; Ratio<sub>s/c</sub>, normalized ratios for lupus anticoagulant screen and lupus anticoagulant–confirm coagulation times; and vWF, von Willebrand factor.

\*Adjusted for age, residence area, and index year.

†Adjusted for age at index date, index year, area of residence, hypercholesterolemia, hypertension, diabetes mellitus, and smoking.

‡Adjusted for age, year of event/index year, area of residence, hypercholesterolemia, hypertension, diabetes mellitus, and smoking.

## **Guidelines for the Prevention of Stroke in Women**

**A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association**

Women with **migraine with aura** who also **smoked cigarettes** and used **OCs** had **7.0-fold** higher odds (95% CI, 1.3–22.8) of stroke than women with probable migraine with visual aura who did not smoke or use OCs; however, women with probable migraine with visual aura who were OC users but nonsmokers did not have a significantly increased odds of stroke, which suggests the risk with both OC use and smoking in women with probable migraine with visual aura is additive.

### **OCs: Recommendations**

1. OCs may be harmful in women with additional risk factors (eg, cigarette smoking, prior thromboembolic events) (*Class III; Level of Evidence B*).<sup>224,225</sup>
2. Among OC users, aggressive therapy of stroke risk factors may be reasonable (*Class IIb; Level of Evidence C*).<sup>224,225,231</sup>
3. Routine screening for prothrombotic mutations before initiation of hormonal contraception is not useful (*Class III; Level of Evidence A*).<sup>229</sup>
4. Measurement of BP before initiation of hormonal contraception is recommended (*Class I; Level of Evidence B*).<sup>220,235,236</sup>

# Gravidanza e Puerperio



**Table 6. Adverse Pregnancy Outcomes and Risk for Stroke**

Study Date and Author	Total No. of Subjects	Study Design	Pregnancy Outcome	Cerebrovascular Outcome	Follow-up, y	HR or OR for Outcome (95% CI)
Mannistö et al,	10314	Prospective	Gestational	Ischemic cerebrovascular disease	40	1.67 (1.13–2.45)
				Cerebrovascular events (infarction, hemorrhage, subarachnoid hemorrhage, TIA, stroke)		Preterm birth 2.41 (1.4–4.17); SGA birth 1.68 (1.46–2.06); preterm and SGA birth 1.67 (1.13–2.45)
				Stroke		3.07 (2.18–4.33)
				Cerebrovascular disease		2.53 (1.70–3.77)
2003 <sup>178</sup>		study				
Lykke et al, 2009 <sup>179</sup>	782287	Retrospective cohort	Gestational hypertension, mild preeclampsia, severe preeclampsia	Stroke	12.9–14.6	Gestational hypertension 1.58 (1.32–1.89); mild preeclampsia 1.50 (1.36–1.66); severe preeclampsia 1.66 (1.29–2.14)

CI indicates confidence interval; HR, hazard ratio; OR, odds ratio; SGA, small for gestational age; and TIA, transient ischemic attack.

\*Defined as preeclampsia between 16 and 36 weeks.

**Prevention of Stroke in Women With a History of Preeclampsia**

1. Because of the increased risk of future hypertension and stroke 1 to 30 years after delivery in women with a history of preeclampsia (*Level of Evidence B*), it is reasonable to (1) consider evaluating all women starting 6 months to 1 year post partum, as well as those who are past childbearing age, for a history of preeclampsia/eclampsia and document their history of preeclampsia/eclampsia as a risk factor, and (2) evaluate and treat for cardiovascular risk factors including hypertension, obesity, smoking, and dyslipidemia (*Class IIa; Level of Evidence C*).

**Preeclampsia and Pregnancy Outcomes: Recommendations**

**Prevention of Preeclampsia**

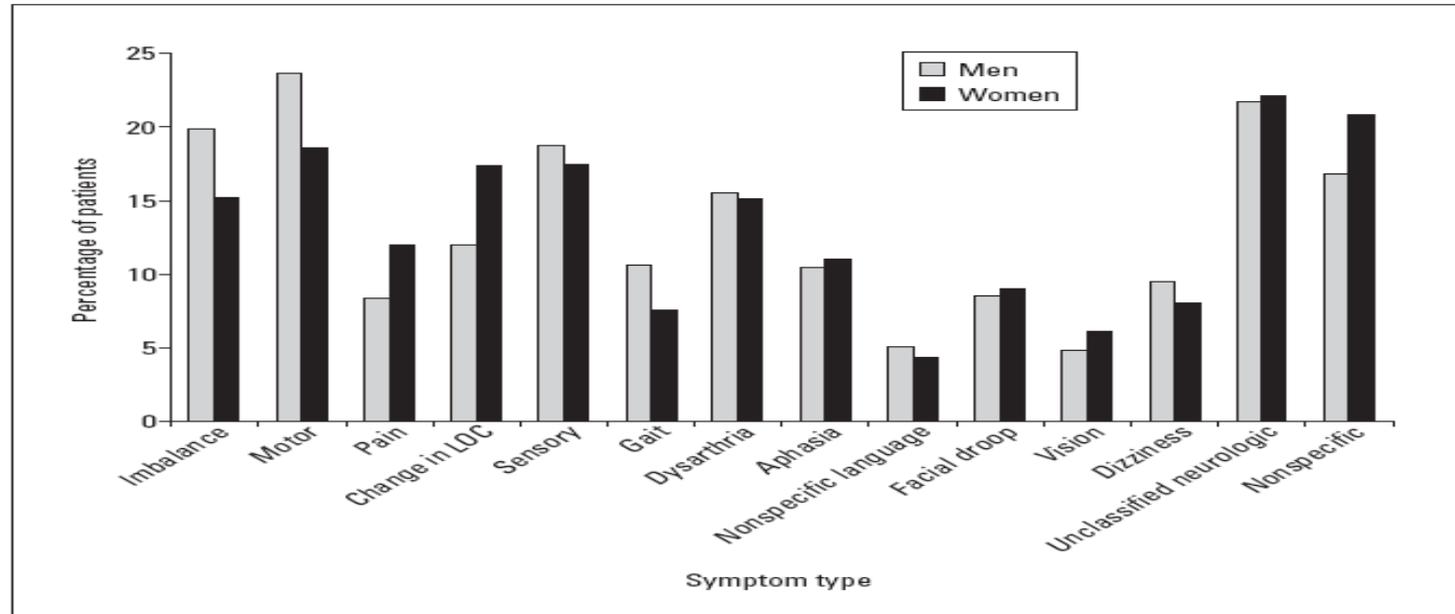
1. Women with chronic primary or secondary hypertension or previous pregnancy-related hypertension should take low-dose aspirin from the 12th week of gestation until delivery (*Class I; Level of Evidence A*).

**Guidelines for the Prevention of Stroke in Women**

**A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association**

# Sex and Acute Stroke Presentation

Lise A. Labiche, MD  
Wenyaw Chan, PhD  
Kamaldeen R. Saldin, MD  
Lewis B. Morgenstern, MD



**Differenze di genere in 4 categorie di sintomi:**

- **Disequilibrio ed emiparesi più frequenti negli uomini**
- **Dolore e alterazioni della coscienza più frequenti nelle donne**

# Sex and Acute Stroke Presentation

L'augmentata frequenza di donne che riferiscono dolore, cambiamenti nel livello di coscienza, disorientamento e sintomi non neurologici può portare ad una RITARDATA presentazione e ad un SOTTORICONOSCIMENTO delle pazienti donne con stroke e conseguente **RITARDATO E MENO FREQUENTE USO DELLE TERAPIE PER L'ICTUS ACUTO NELLE DONNE**

# Do Presenting Symptoms Explain Sex Differences in Emergency Department Delays Among Patients With Acute Stroke?

Julia Warner Gargano, MS; Susan Wehner, MSN; Mathew J. Reeves, PhD

*Stroke 2009; 40:114-1120*

- 1922 pazienti con ictus acuto
- Le donne hanno una probabilità significativamente minore degli uomini di presentarsi con qualunque sintomo di allarme per stroke o sospetto stroke (87.5% vs 91.4%) o di riferire disturbi della deambulazione, dell'equilibrio o vertigini (9.5% vs 13.7%)
- Le donne hanno intervalli door to doctor del 11% e intervalli door to image del 15% **più lunghi** rispetto agli uomini
- Il maggiore ritardo nel workup delle donne con stroke rispetto agli uomini non è attribuibile a differenze nei sintomi di presentazione, sebbene una più lenta valutazione in ED possa avere delle implicazioni per l'eligibilità delle donne per un trattamento fibrinolitico sistemico e possa in parte spiegare perché i tassi di somministrazione di rtPA siano più bassi nelle donne

# Trombolisi: Utilizzo del t-PA

❖ Le donne sono sottoposte meno a terapia trombolitica con t-PA rispetto agli uomini (5% vs. 9%,  $p=0.001$ ; adjusted OR 0.55, 0.38-0.80) (Reid, 2008, studio di registro ospedaliero)

## Meta-analysis on sex difference in the use of t-PA: women had a 30% lower odds of receiving t-PA

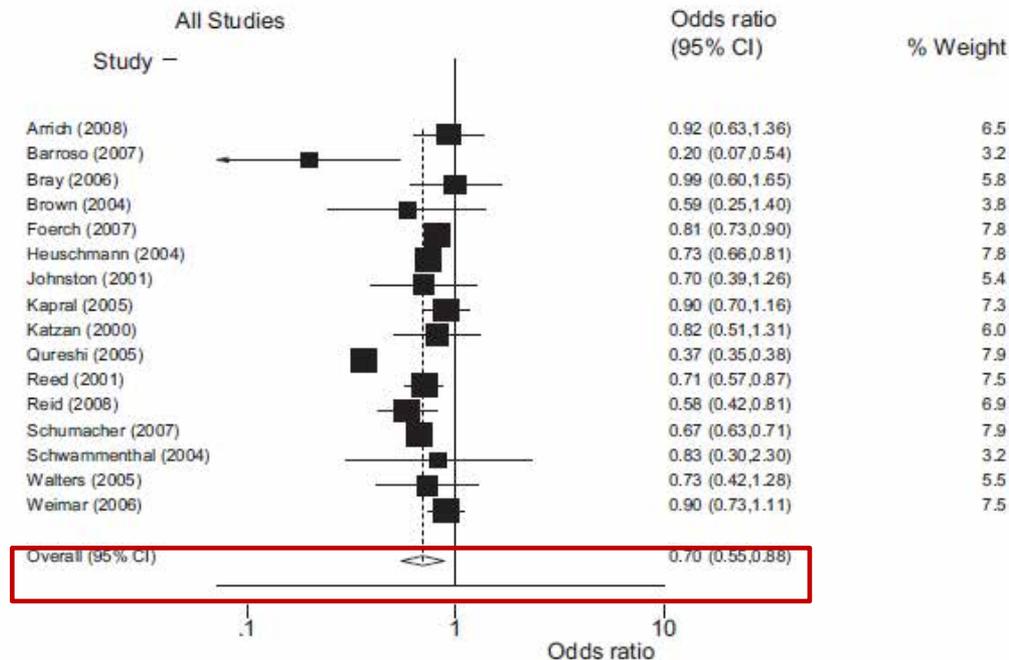


Figure 1. Forest plot of the unadjusted OR of IV-t-PA use in women compared to men in all acute ischemic stroke admissions. Random effects model ( $n=16$  studies).  $OR<1$  indicates lower rt-PA use in women compared to men.

# Trombolisi: Outcome

## Does Sex Influence the Response to Intravenous Thrombolysis in Ischemic Stroke?

### Answers From Safe Implementation of Treatments in Stroke-International Stroke Thrombolysis Register

Svetlana Lorenzano, MD, PhD, MSc; Niaz Ahmed, MD, PhD; Anne Falcou, MD, PhD;  
Robert Mikulik, MD, PhD; Turgut Tatlisumak, MD, PhD; Christine Roffe, MD;  
Nils Wahlgren, MD, PhD; Danilo Toni, MD, PhD, FESO; on behalf of the SITS Investigators

**Background and Purpose**—Women are more likely to have a worse outcome after an acute stroke than men. Some studies have suggested that women also benefit less from intravenous thrombolysis after an acute ischemic stroke, but others found no sex differences in safety and efficacy. We aimed to evaluate differences in 3-month outcome between sexes in intravenous tissue-type plasminogen activator–treated patients registered in the Safe Implementation of Treatments in Stroke-International Stroke Thrombolysis Register.

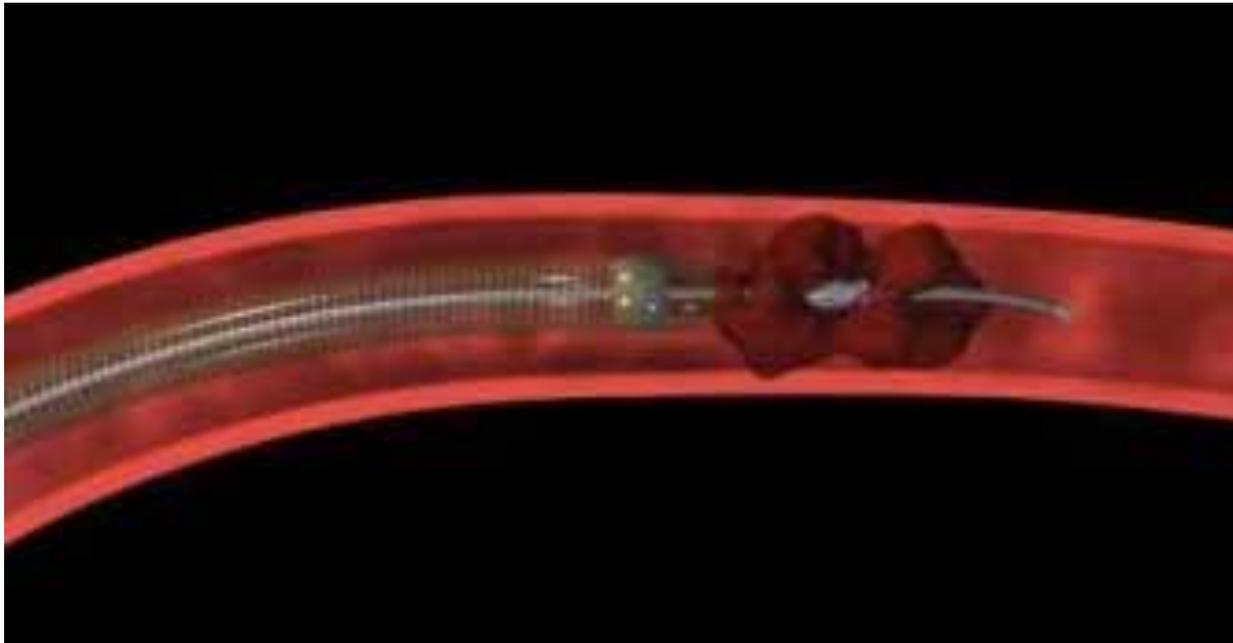
**Methods**—A total of 45 079 patients treated with intravenous alteplase were recorded from 2002 to 2011. Main outcome measures were symptomatic intracerebral hemorrhage, functional independence (modified Rankin Scale score, 0–2), and mortality at 3 months.

**Results**—Among 25 777 (57.2%) men and 19 302 (42.8%) women, we found no difference in the rate of symptomatic intracerebral hemorrhage ( $P=0.13$ ), a significantly higher likelihood of functional independence at 3 months in men ( $P<0.0001$ ) and a higher mortality in women when compared with men ( $P<0.00001$ ). After adjustment for confounding variables, we did not observe any difference between sexes in functional outcome (odds ratio, 1.03; 95% confidence interval, 0.97–1.09;  $P=0.39$ ) whereas male sex was related to a higher risk of mortality (odds ratio, 1.19; 95% confidence interval, 1.10–1.29;  $P=0.00003$ ) and symptomatic intracerebral hemorrhage (odds ratio, 1.25; 95% confidence interval, 1.04–1.51;  $P=0.02$ ).

**Conclusions**—Data from Safe Implementation of Treatments in Stroke-International Stroke Thrombolysis Register suggest that intravenous thrombolysis may modify the observed survival and recovery advantage for men expected in the natural course of an ischemic stroke, with a possible larger beneficial treatment effect in women when compared with men. (*Stroke*. 2013;44:3401-3406.)

# Trombolisi: Ricanalizzazione

- ❖ IV t-PA: Le donne hanno un tasso di ricanalizzazione del 94% vs. il 59% nei maschi (**Savitz, 2005**)
- ❖ I.A. thrombolysis:
  - alcuni studi suggeriscono che nelle donne l'effetto del trattamento con IA pro-urokinase è due volte maggiore rispetto agli uomini (**Hill, 2006**)
  - Case series non mostrano alcuna differenza nel tasso di ricanalizzazione (**Shah, 2006**)



# Outcome a lungo termine e Riabilitazione

Revisione sistematica di outcomes a  $\geq 12$  mesi dallo stroke (**Gall, Stroke 2012**):

- ❖ Le donne hanno un outcome funzionale peggiore ma le differenze con gli uomini si riducono dopo aggiustamento per fattori confondenti come: età, gravità dello stroke, depressione, attività funzionale pre-stroke, comorbidità.
- ❖ Possibili cause: in generale in soggetti senza stroke, le donne hanno una più bassa QOL ; depressione; uno status socio-economico più basso; disabilità preesistente; demenza; limitazioni nella funzionalità muscolare.

Riabilitazione (**Paolucci, Stroke 2006**):

- ❖ Gli uomini hanno un odds 3 volte più alto di essere indipendenti nel salire le scale rispetto alle donne
- ❖ Le donne hanno un odds di 1.7 volte più alto rispetto agli uomini di camminare con il bastone o con aiuto.

# SALUTE, EQUITA' E ISTITUZIONI

- Stranieri e immigrati
- Razza
- Condizioni geografiche

# Campagna Ictus RER (2018)

Regione Emilia Romagna

SERVIZIO SANITARIO REGIONALE EMILIA-ROMAGNA



**ICTUS: VEDO RICONOSCO CHIAMO**

In Italia l'ictus è la terza causa di morte e rappresenta la prima causa di invalidità. **Impariamo a riconoscere i sintomi, per chiamare tempestivamente il 118.**

**BOCCA "STORTA"**  
Se noti che la persona ha la bocca che pende da un lato, chiedile di sorridere.



**INDEBOLIMENTO DEL BRACCIO**  
Se noti che la persona presenta difficoltà ad utilizzare un braccio, chiedile di alzarlo: rimarrà abbassato o ricadrà subito.



**DIFFICOLTÀ A PARLARE**  
Se noti che la persona fa fatica a parlare o a comprendere il parlato, chiedile di descrivere un'azione semplice.



**DIFFICOLTÀ ALLA VISTA**  
Se noti che la persona non riconosce gli oggetti a parte di essi, chiedile di leggere l'ora.



in collaborazione con



#vedoriconoscochiama



1. VEDO

2. RICONOSCO

3. CHIAMO



- VEDO
- RICONOSCO
- CHIAMO

• أرى أنني أدرك أنني أتصل

• 我知道我打電話了

Original Report:  
Cardiovascular Disease  
and Risk Factors

## RACE-ETHNIC DISPARITIES IN HOSPITAL ARRIVAL TIME AFTER ISCHEMIC STROKE

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Mellanie V. Springer, MD, MS<sup>1</sup>;  
Daniel L. Labovitz, MD, MS<sup>1</sup>;  
Ethan C. Hochheiser, BA<sup>1</sup>

**Conclusions:** African American men and socially disadvantaged women delay in presenting to the hospital after stroke onset. Future research should focus on identifying the factors contributing to pre-hospital delay among race-ethnic minorities. *Ethn Dis.* 2017;27(2):125-132; doi:10.18865/ed.27.2.125.





Grazie per l'attenzione