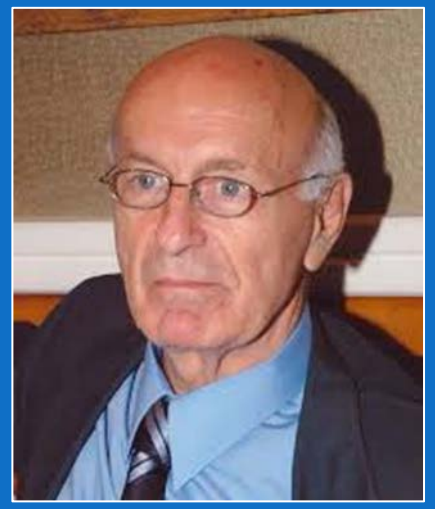
ΜΝΗΜΗ
ΔΗΜΗΤΡΗ ΤΡΙΧΟΠΟΥΛΟΥ



Αγγειακά Εγκεφαλικά Επεισόδια:

Πρόληψη επί τη βάση Δεδομένων Επιδημιολογικών Μελετών του Ελληνικού Χώρου

Παναγιώτης Μήτσιας

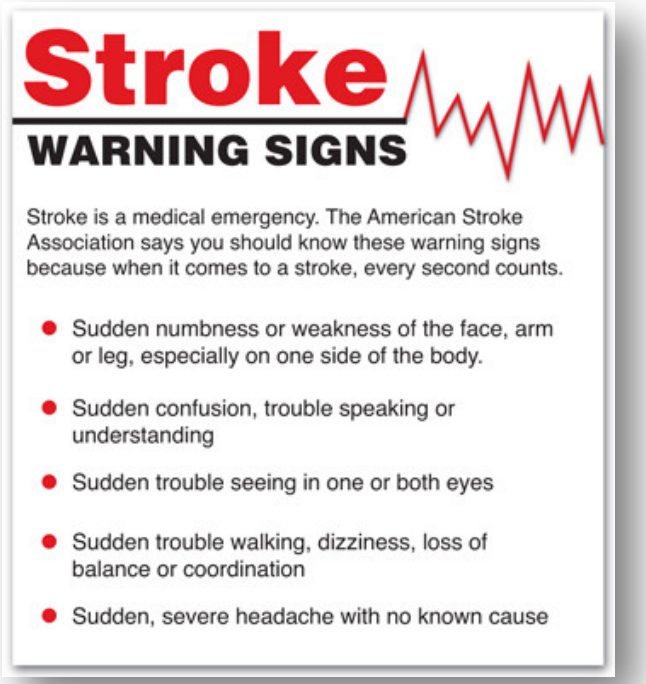
Καθηγητής Νευρολογίας, Πανεπιστήμιο Κρήτης

Διευθυντής Νευρολογικής Κλινικής, ΠΑΓΝΗ

Director, Stroke Research

Henry Ford Hospital, Detroit, Michigan, USA

MAY = Stroke Month



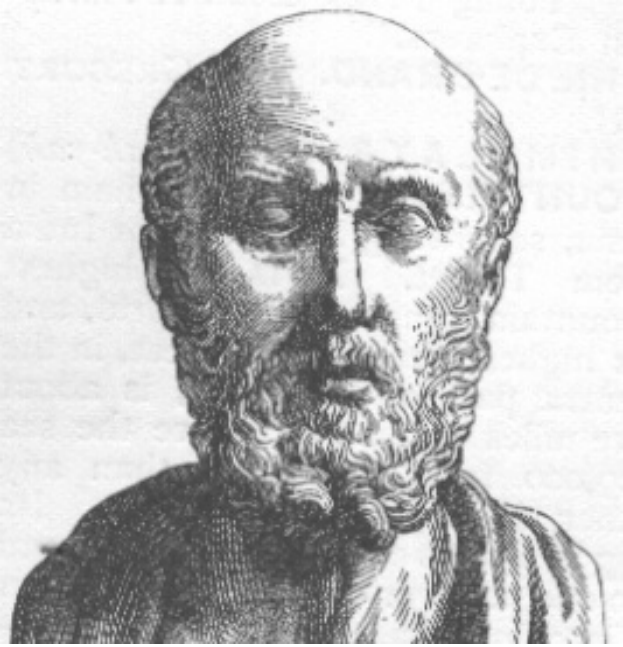
Στόχοι της Διάλεξης

- Εισαγωγή στις έννοιες ΑΕΕ και τύπων
- Σημασία των επιδημιολογικών μελετών στην αποτύπωση της υγείας του πληθυσμού και του προβλήματος των ΑΕΕ
- Ανάλυση παραγόντων κινδύνου για ΑΕΕ
- Αναγνώριση ανθρώπων υψηλού κινδύνου για ΑΕΕ
- Ανάλυση θεραπευτικών στρατηγικών για πρόληψη ΑΕΕ
- Προτάσεις για βελτίωση πρόληψης ΑΕΕ στην κοινωνία μας

Definition of Stroke

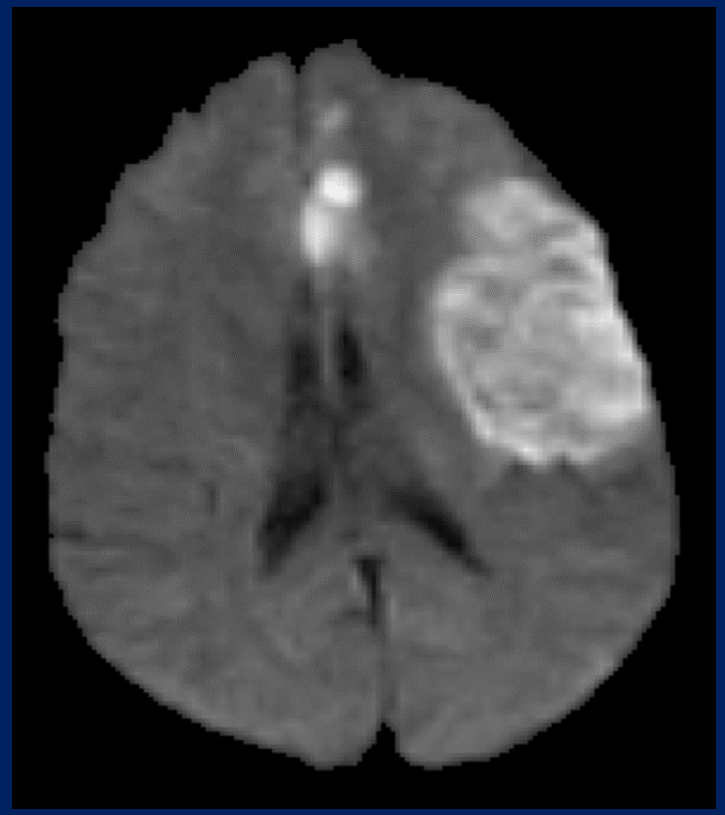
A sudden loss of brain function caused by a blockage or rupture of a blood vessel to the brain or the spinal cord.

Hippocrates was the first to describe the phenomenon of “sudden paralysis” using the term **“Apoplexy”**, which in Greek means “struck down with violence”

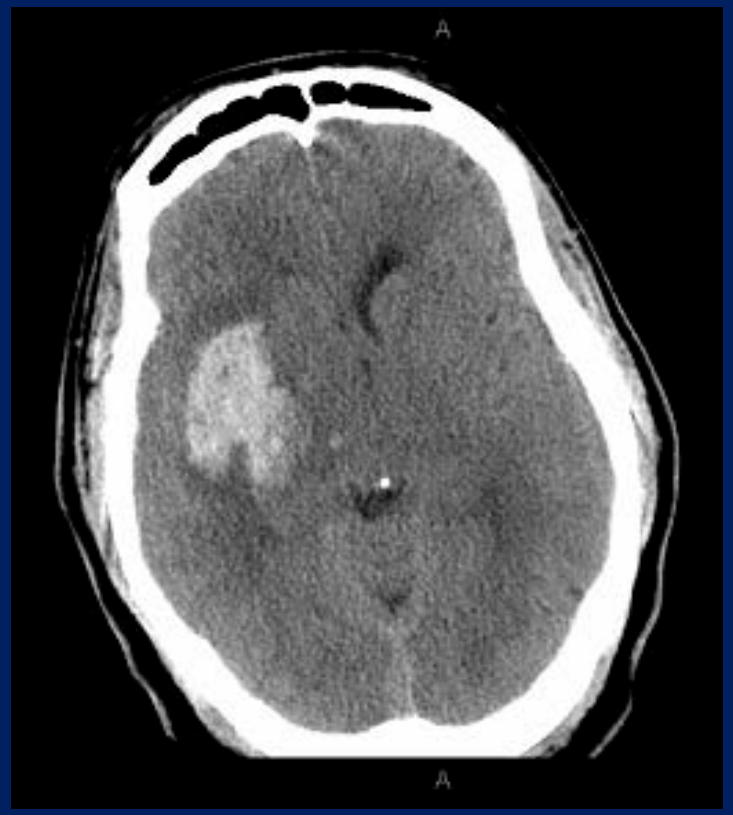


Stroke. 1996;27:1427-1434

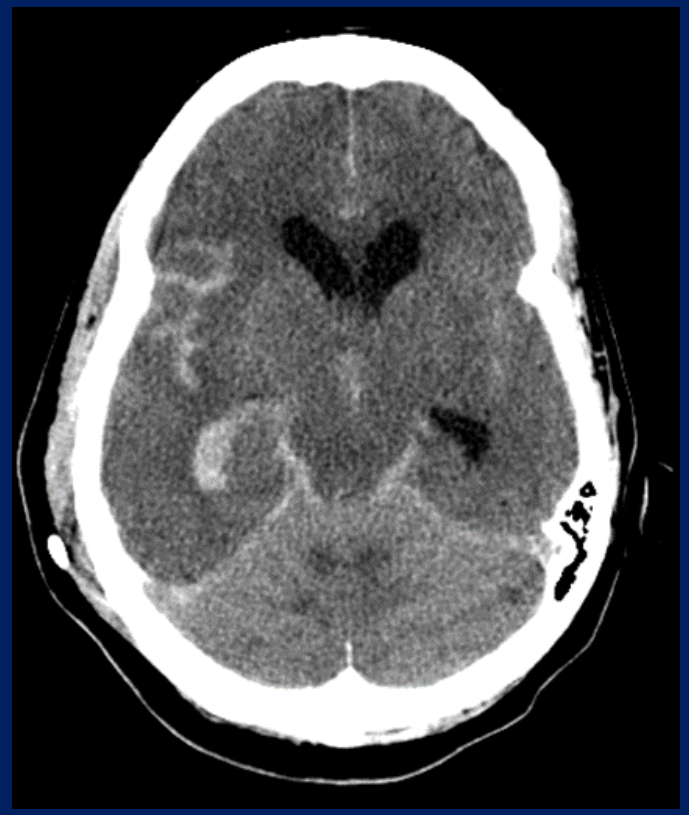
STROKE TYPES



Ischemic
Stroke
87%

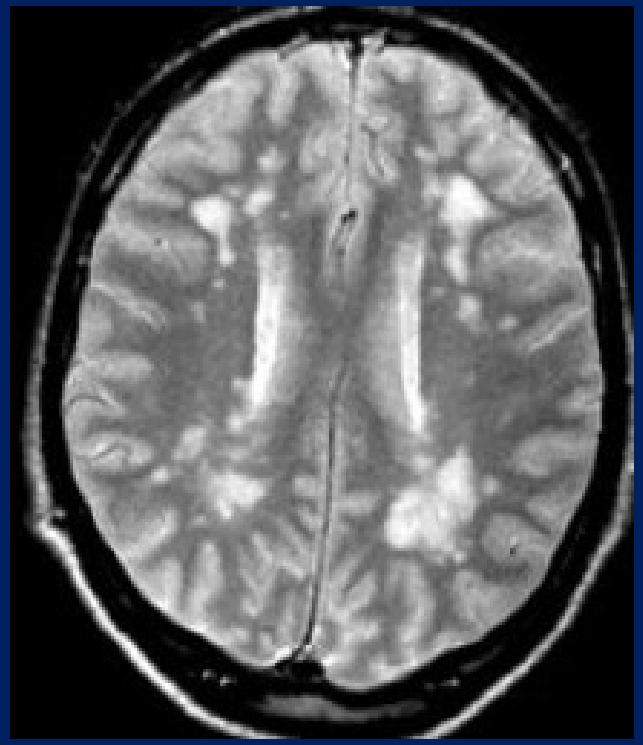


Intracerebral
Hemorrhage
10%

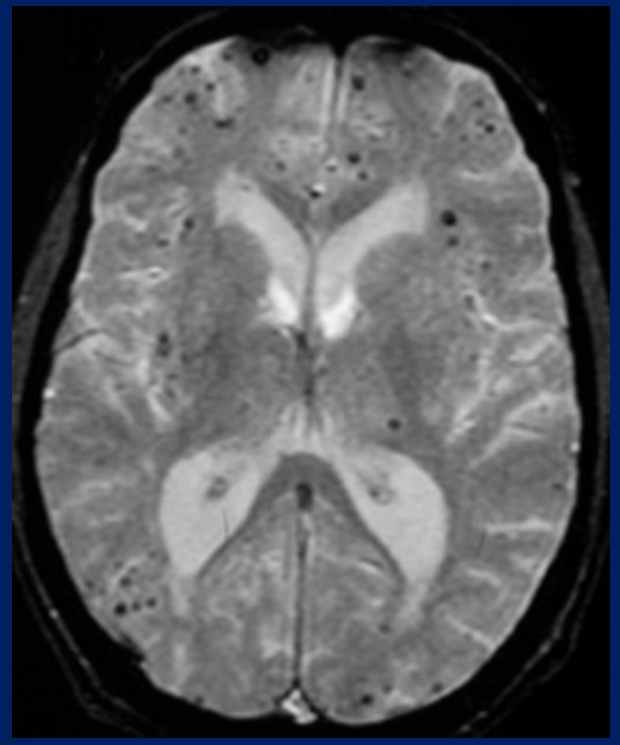


Subarachnoid
Hemorrhage
3%

Silent Cerebrovascular Disease



ISCHEMIC WHITE MATTER DISEASE



MICROBLEEDS

- Typically the result of high burden of stroke risk factors
- An expression of underlying small vessel disease of the brain
- Individuals with SCVD are at high risk to develop stroke and dementia
- Increased risk of intracerebral hemorrhage while on long term oral anticoagulation

Τα ΑΕΕ είναι μία σύγχρονη κοινωνική, ιατρική και προσωπική μάστιγα

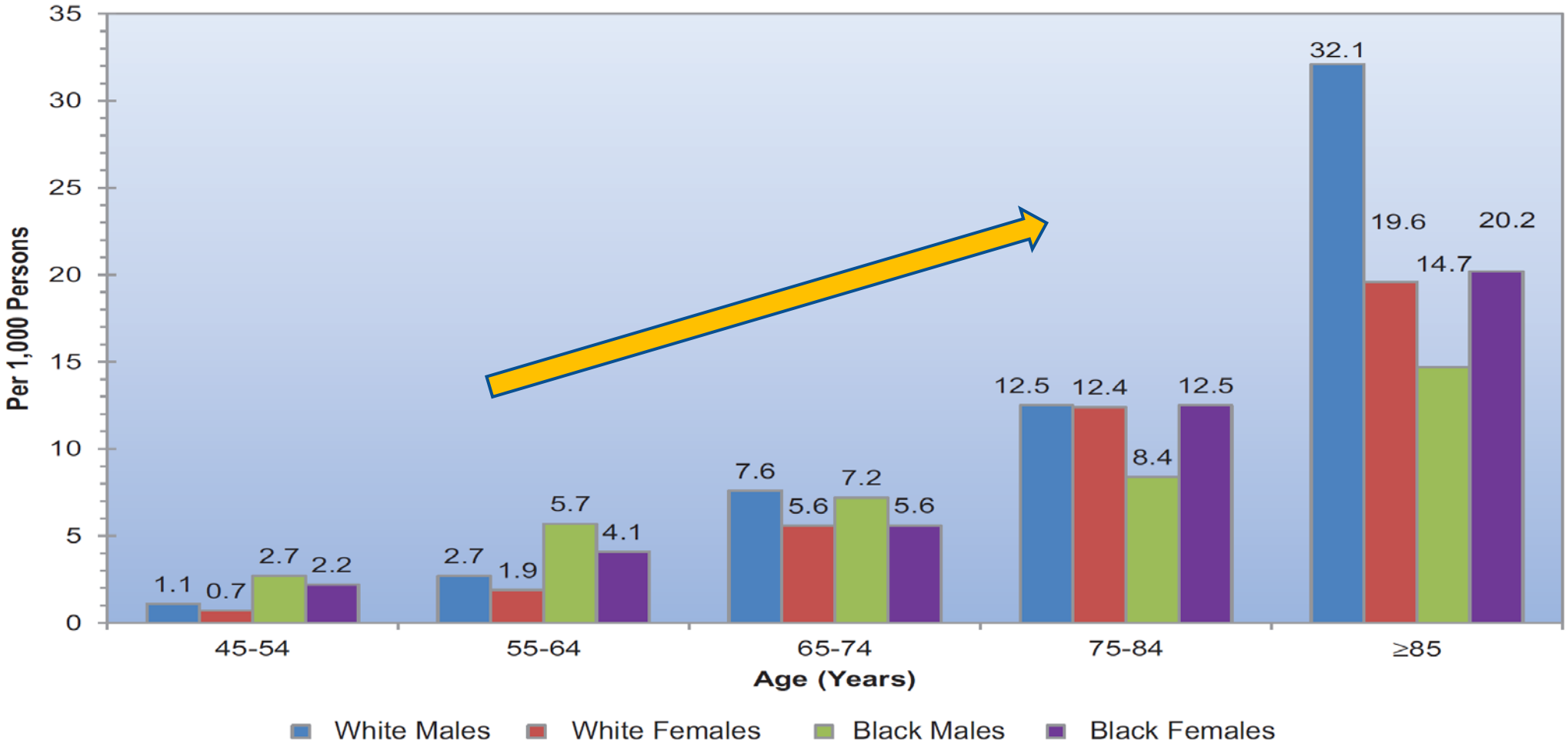
Είναι η κύρια αιτία μείζονος αναπηρίας και μία από τις κύριες αιτίες θανάτου

Stroke Incidence in the US

- Each year 795,000 people experience a new or recurrent stroke
  - 610,000 are first attacks
  - 185,000 are recurrent attacks
    - (GCNKSS, NINDS, NHLBI)
- Stroke types:
  - 87% are ischemic
  - 10% are ICH & 3% are SAH
- Ischemic stroke rates declined slightly for people > 60 years, but remained steady in those aged 45-59 years
- Stroke incidence is declining in the FHS

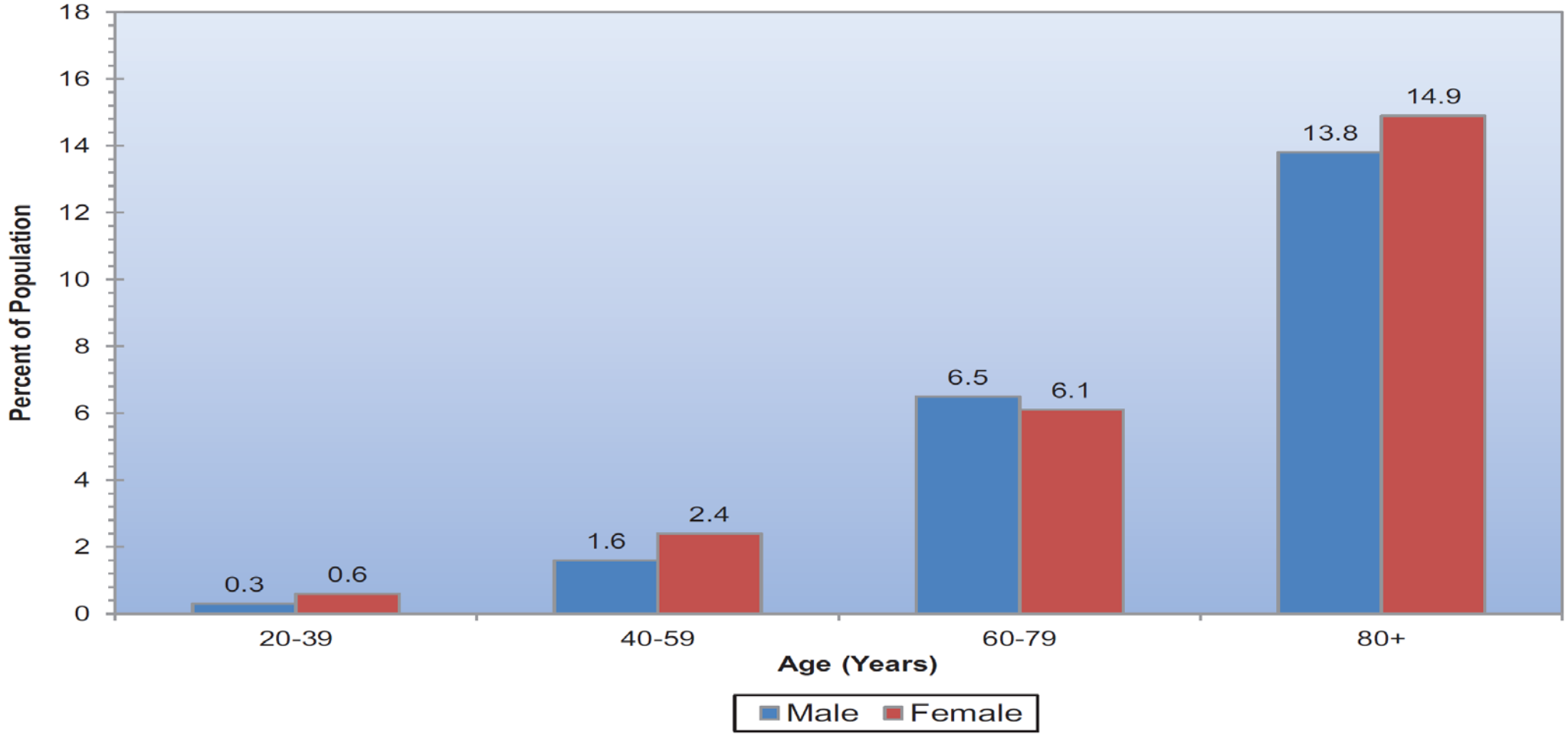
Annual Rate of First Cerebral Infarction

GCNKSS, 1999



Prevalence of Stroke by Age and Sex

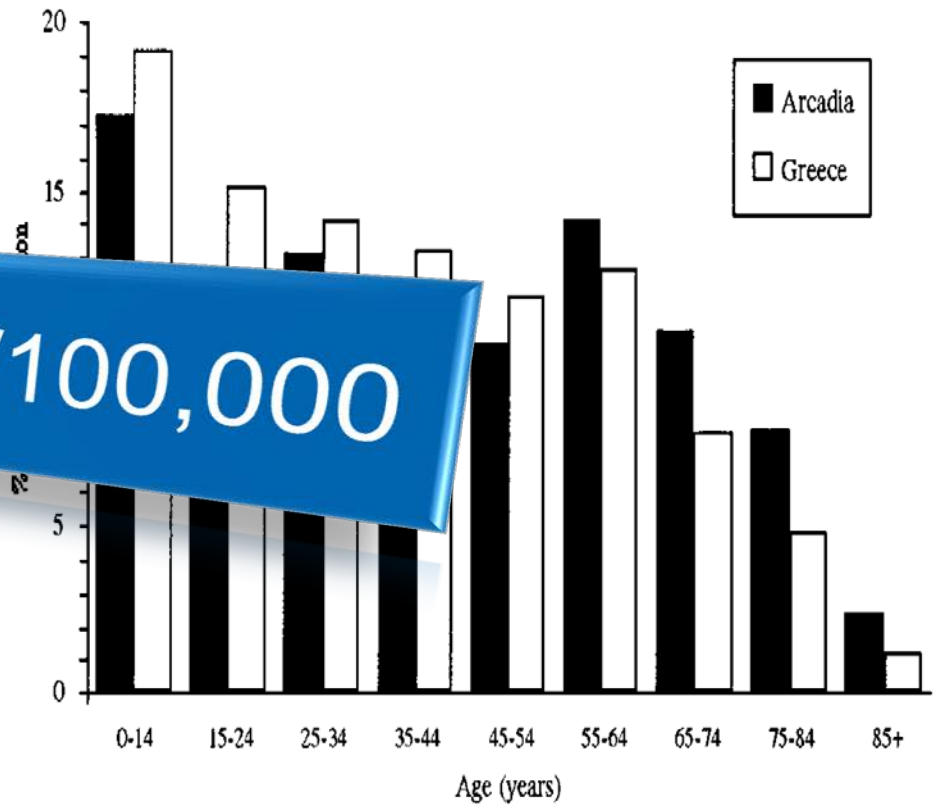
NHANES 2011-2014



Incidence of Stroke in Greece

Annual Incidence (45-84 years): 319/100,000

- Arcadia Stroke Registry, 1993-1995
- Stroke types:
  - Cerebral infarction (M/W): 81%/85%
  - Intracerebral hemorrhage (M/W): 16%/12%
  - Subarachnoid hemorrhage (M/W): 2%/3%



Comparison of the age structure of the study population with that of Greece (1991 census).

Vemmos et al, Stroke 1999

Επιπολασμός στον Ελληνικό Πληθυσμό

Αγγειακό Εγκεφαλικό Επεισόδιο			
			ο
Κατά δήλωση επιπ			
Ηλικία			
<65 ετών		1.2	1.0
≥65 ετών	5.2	4.4	4.7

200,000 άτομα ζούν με συνέπειες ΑΕΕ στην Ελλάδα

- Ο επιπολασμός των ΑΕΕ είναι χαμηλός στον πληθυσμό της Ελλάδας
- Μετά την ηλικία των 65 ετών αυξάνεται κατά 4-5 φορές
- Δεν φαίνεται να σχετίζεται με το επίπεδο μόρφωσης

Stroke Mortality

- 5th cause of mortality in the US (down from 3rd)
  - 30 days: 10.5%
  - 1 year: 21.2%
  - 5 years: 39.8%
- 2nd cause of mortality in the world (up from 3rd)

Case-Fatality & Mortality

Arcadia Stroke Registry
1993-1995

- 555 patients with first ever stroke
- **28-day case fatality rate: 26.6%**
  - No differences between men and women
  - Case fatality increased with age
  - Case fatality was higher for ICH
- **At one year: 204 (36.8%) died**
- Survival

  IS vs ICH: 67.8% vs. 46.4%

Vemmos et al, Stroke 1999, JNNP 2000

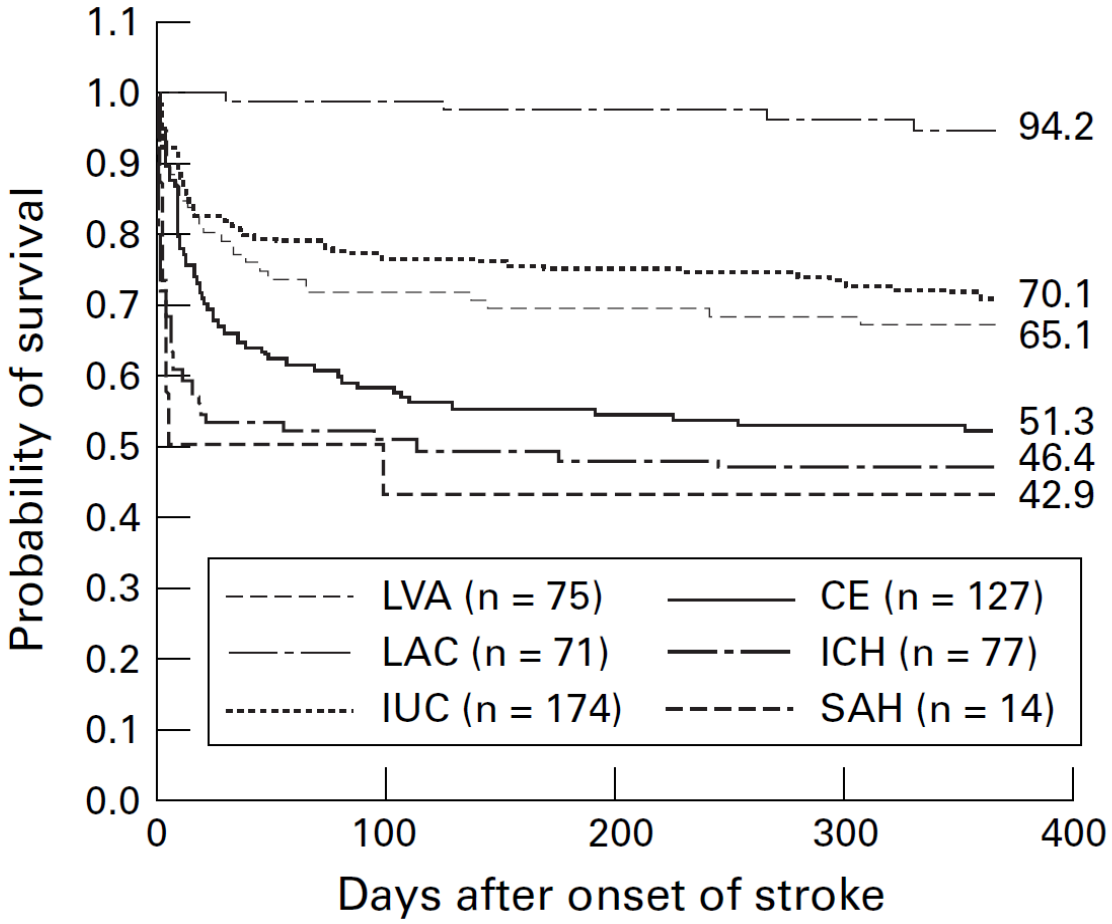


Figure 2 One year survival curves by all stroke subtypes. LVA=large vessel atherothrombotic infarction; LAC=lacunar infarction; IUC=infarction unknown cause; CE=cardioembolic infarction; ICH=intracerebral haemorrhage; SAH=subarachnoid haemorrhage.

Disability and Recovery

- Leading cause of serious long-term disability
- **30-50% of stroke victims are left with significant functional impairment**
- 3% of men and 2% of women in the US are disabled because of stroke
  - (US Census Bureau)
- Women often have greater disability than men

Θεραπεία Ισχαιμικού ΑΕΕ στην Υπεροξεία Φάση

IV tPA Treatment for Ischemic Stroke
3-month Outcomes

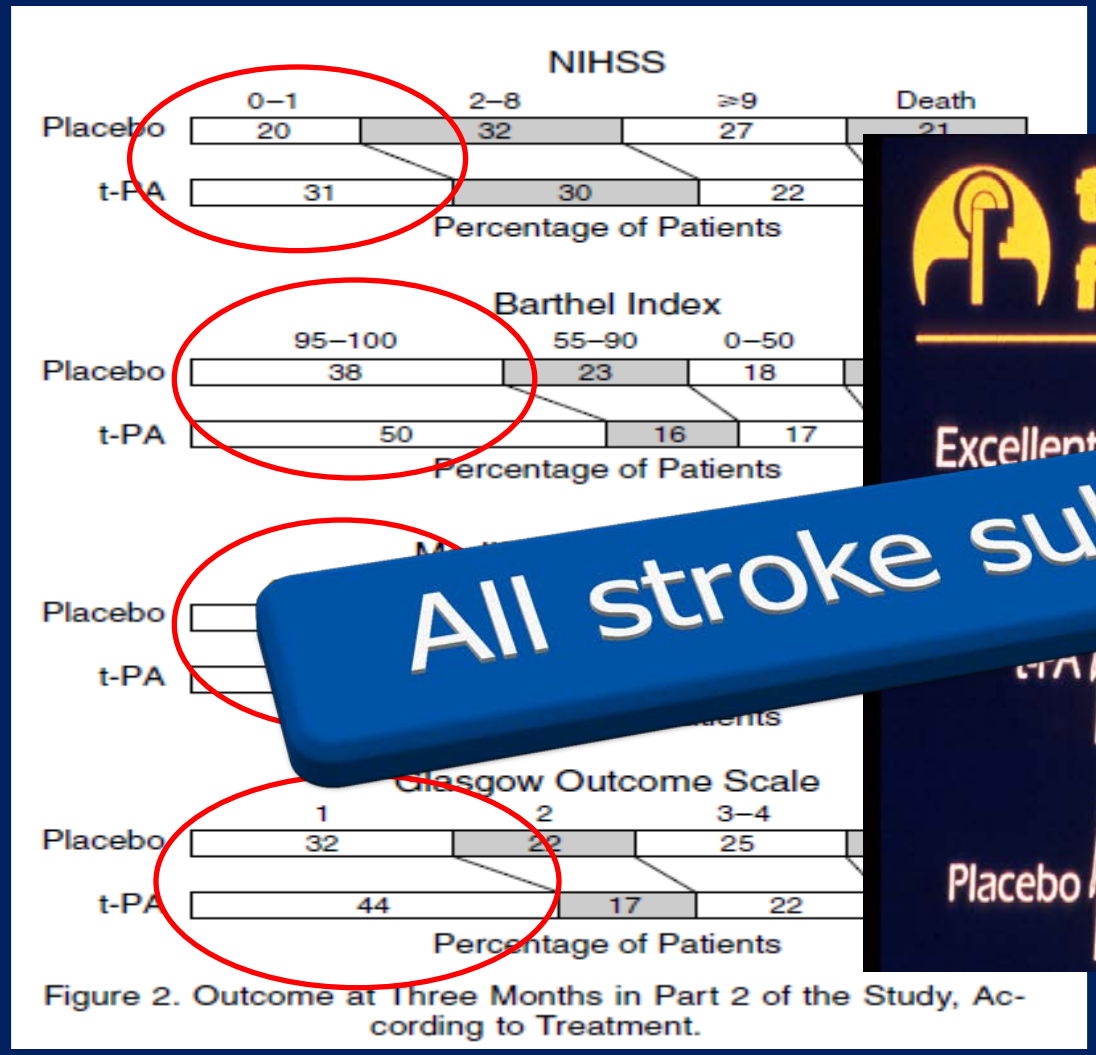
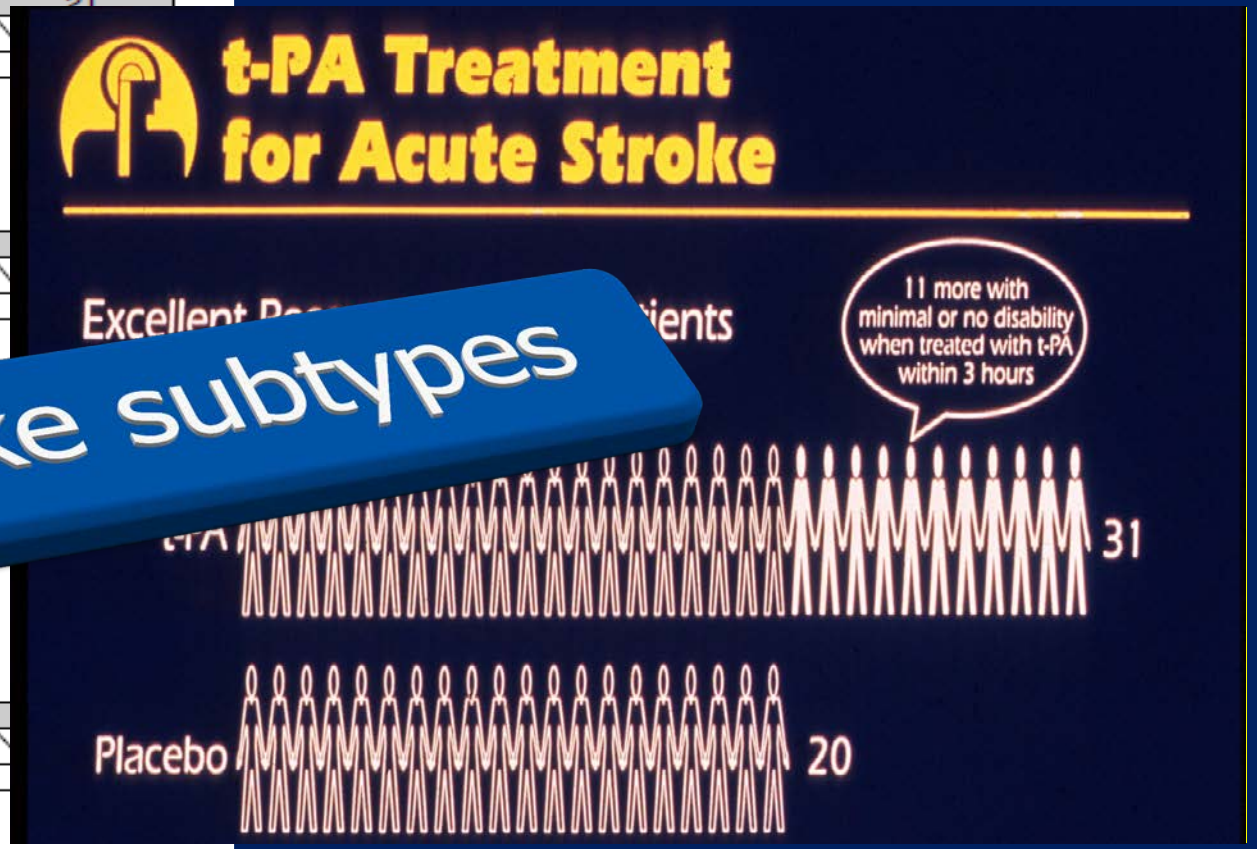
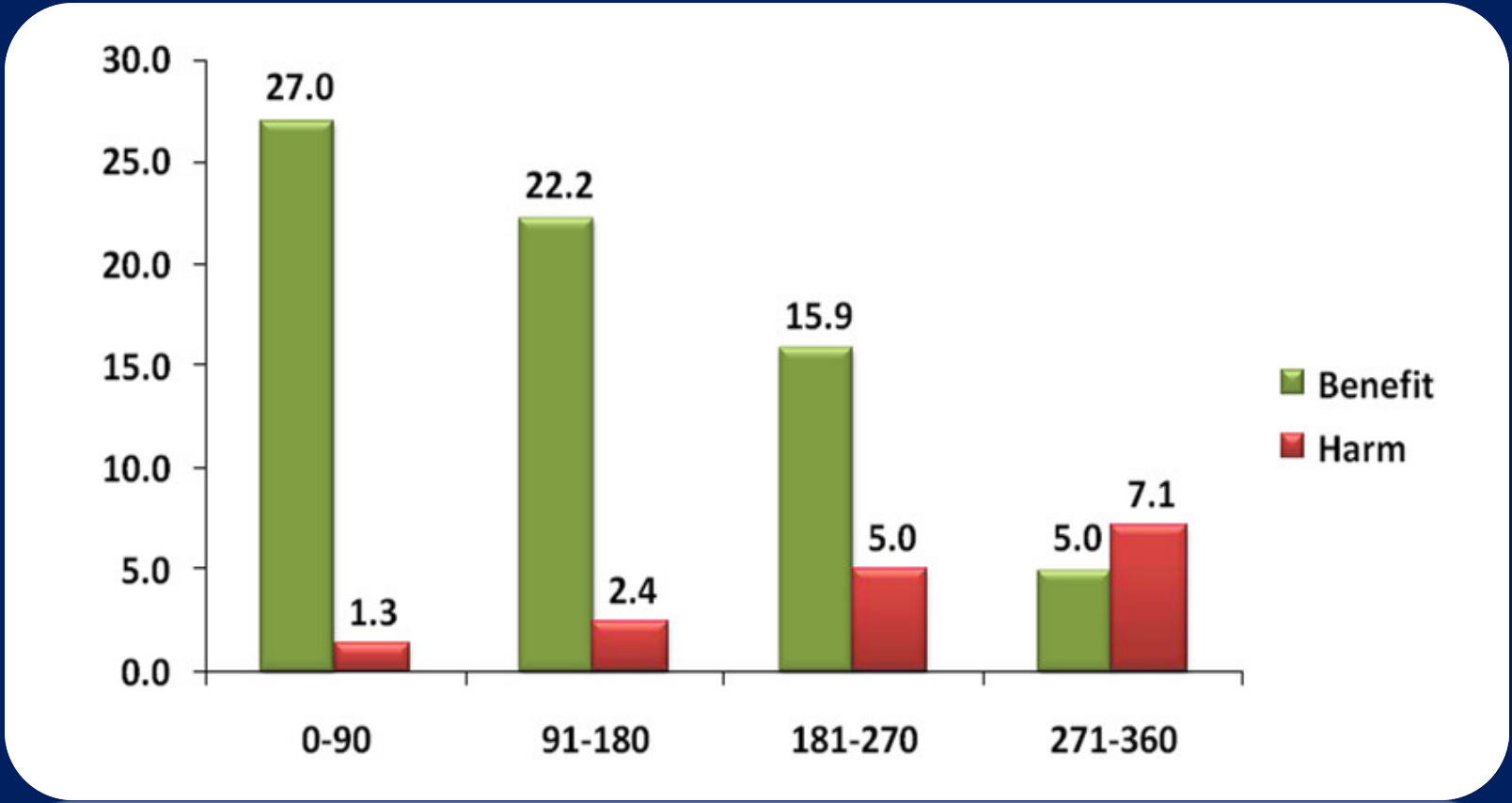


Figure 2. Outcome at Three Months in Part 2 of the Study, According to Treatment.



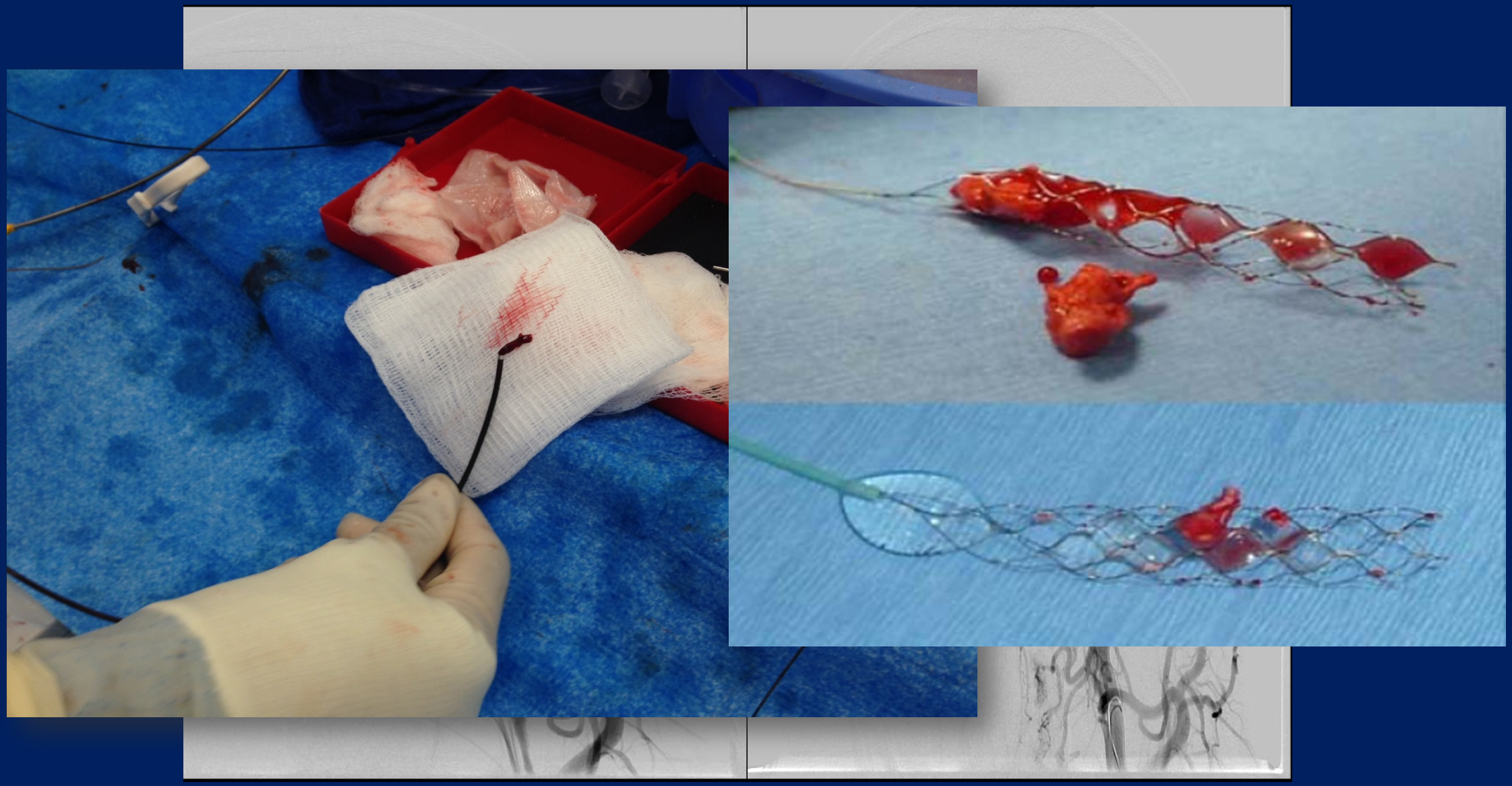
All stroke subtypes

Number of patients who benefit and are harmed per 100 Patients tPA treated in Each Time Window



Landsberg et al, Stroke 2009

Endovascular thrombectomy <6 hours



Σύνοψη

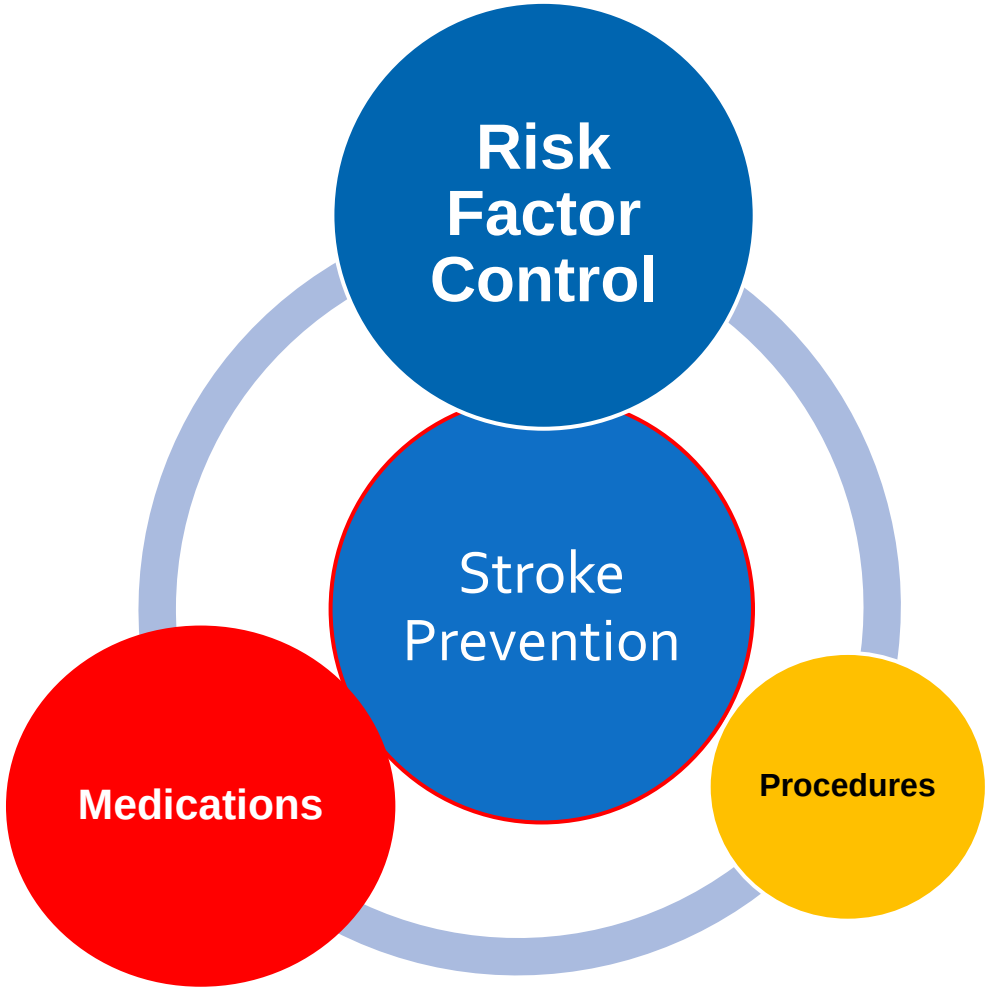
Τα ΑΕΕ είναι μία σύγχρονη προσωπική, ιατρική και κοινωνική μάστιγα και η κύρια αιτία μείζονος αναπηρίας και μία από τις κύριες αιτίες θανάτου

Οι επείγουσες θεραπείες (θρομβόλυση και θρομβεκτομή) έχουν την δυνατότητα να ελαχιστοποιήσουν τις συνέπειες των ΑΕΕ αλλά χρησιμοποιούνται σε λιγότερο από το 5% των ασθενών

Έμφαση πρέπει να δοθεί στην πρόληψη τους (πρωτογενής πρόληψη) και στην πρόληψη των υποτροπών τους (δευτερογενής πρόληψη).

Stroke Prevention

- Primary Prevention
- Secondary Prevention



Η πρόληψη των ΑΕΕ ξεκινά με την αναγνώριση και έλεγχο των παραγόντων κινδύνου

Stroke Risk Factors

- Non-modifiable risk factors
  - ✓ Age
  - ✓ Low-birth weight
  - ✓ Race-ethnicity
  - ✓ Genes
- Well-documented modifiable risk factors
- Less well documented or potentially modifiable

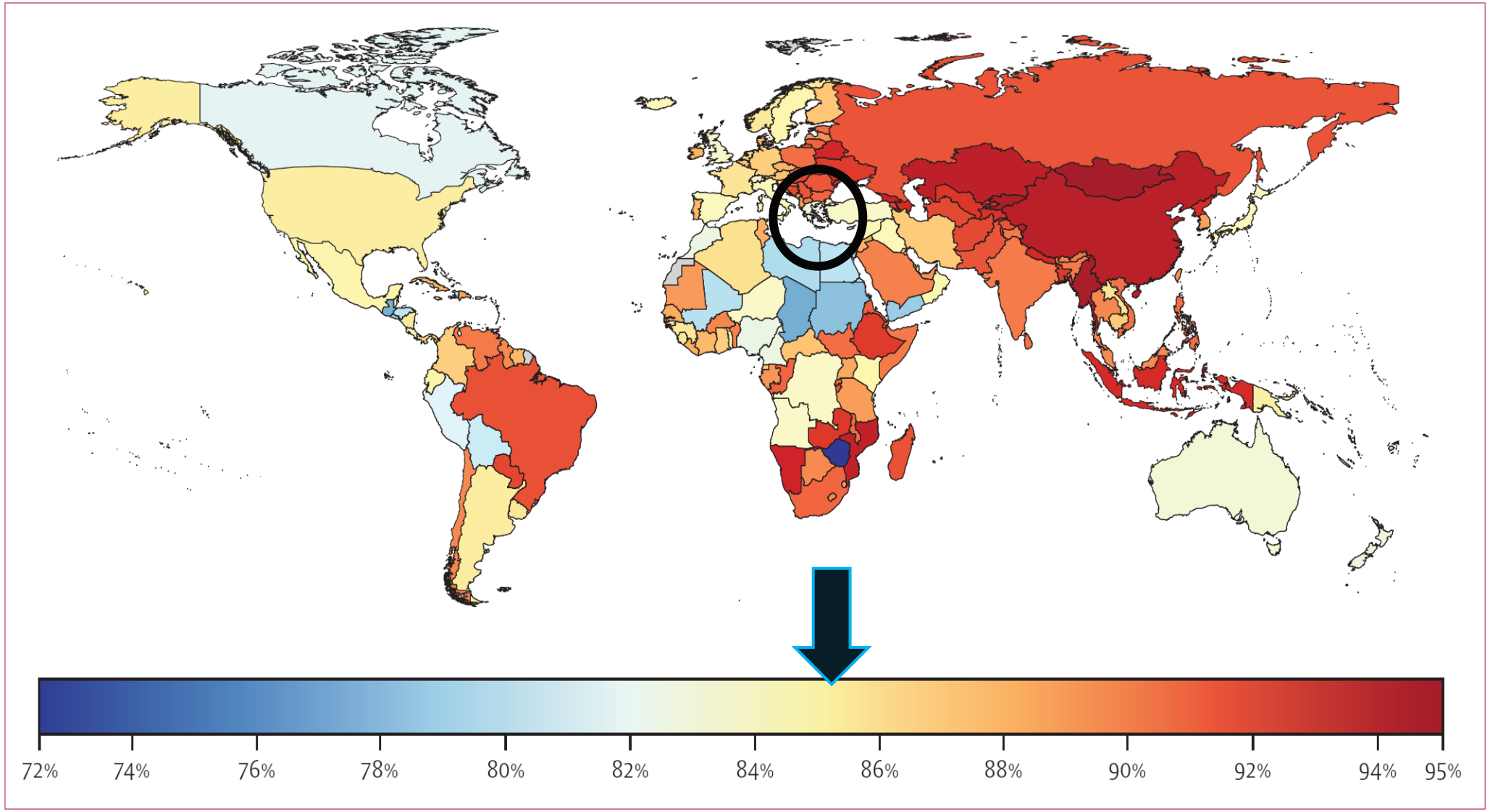
Well-documented modifiable risk factors

- Physical Inactivity
- Nutrition
- Dyslipidemia
- Hypertension
- Obesity & body fat distribution
- Diabetes mellitus
- Cigarette smoking
- Atrial fibrillation
- Carotid artery stenosis
- Sickle cell disease

Less well documented or potentially modifiable RF

- Migraine
- Metabolic syndrome
- Alcohol consumption
- Drug abuse
- Sleep-disordered breathing
- Hyperhomocysteinemia
- Hypercoagulable states
- Inflammation and infection

Stroke-related DALYs attributable to all modifiable risk factors



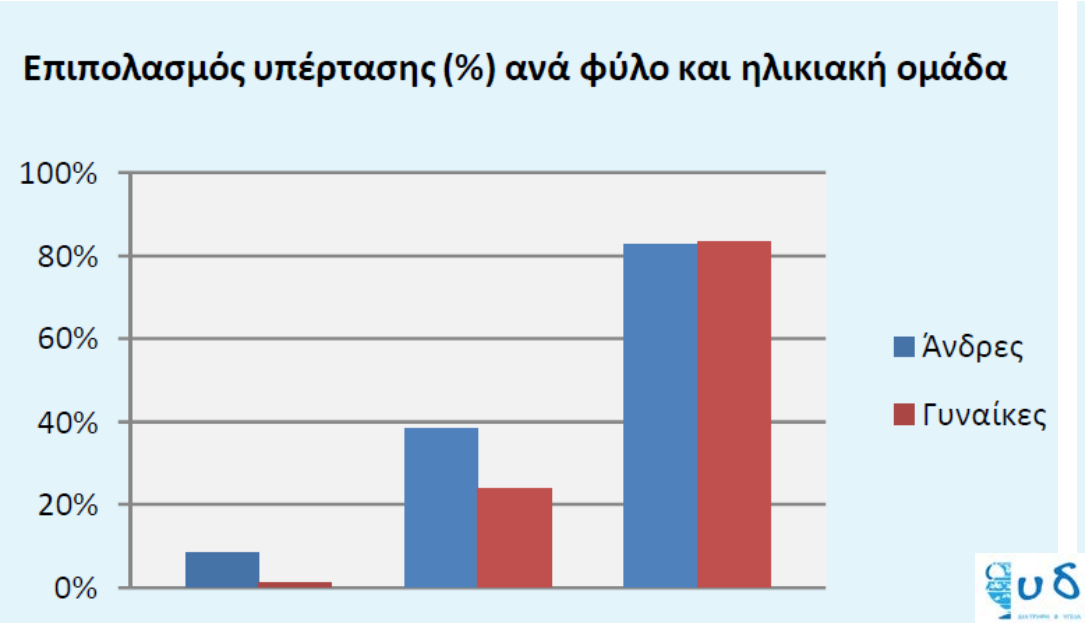
Murray et al, Lancet 2013

Hypertension

- **SBP≥140 mm Hg and/or DBP≥90 mm Hg**
- Hypertension increases risk of stroke by 4 то >16 times
- Treatment of hypertension is the most important intervention for prevention of ischemic stroke

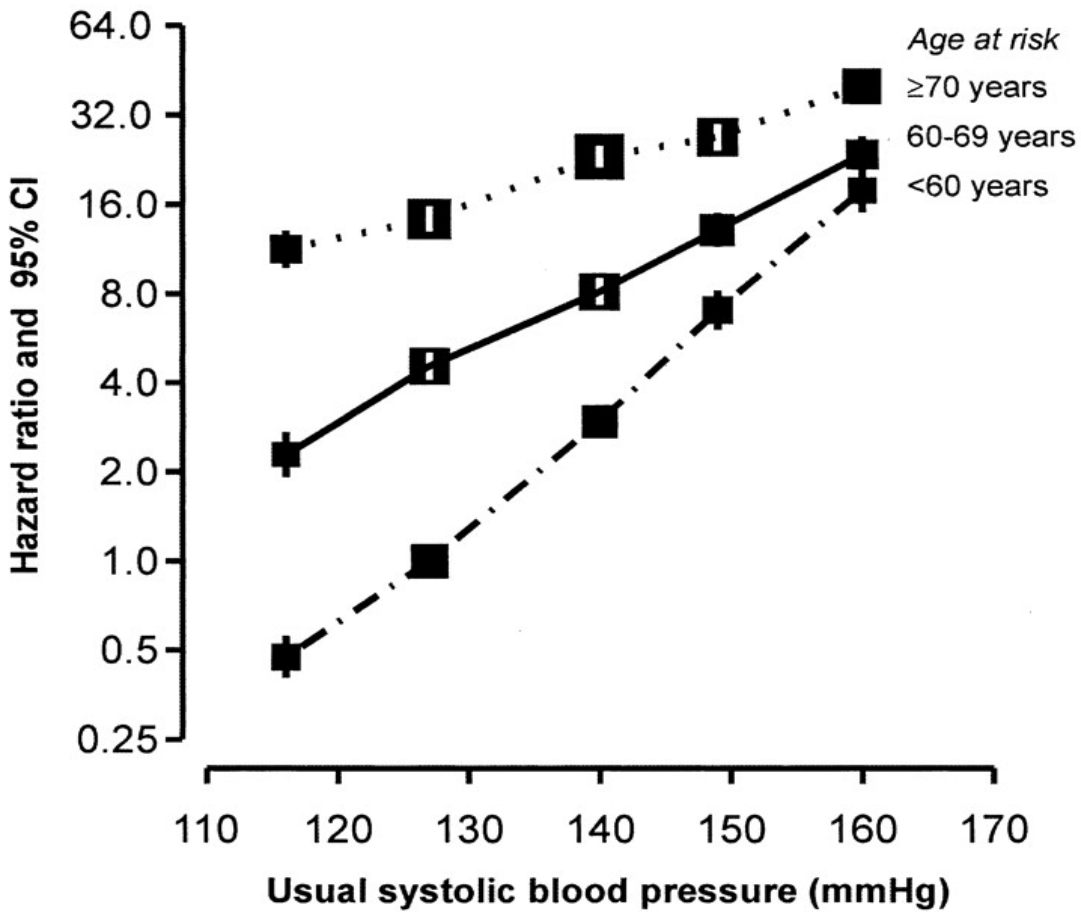
Υπέρταση στον Ελληνικό Πληθυσμό

	Άνδρες	Γυναίκες	**Σύνολο**
Συνολικός επιπολασμός	45.8	37.9	41.7
Ηλικία			
18-24 ετών	8.6	1.1	4.8
25-64 ετών	38.2	23.8	30.9
≥65 ετών	82.4	83.3	82.9

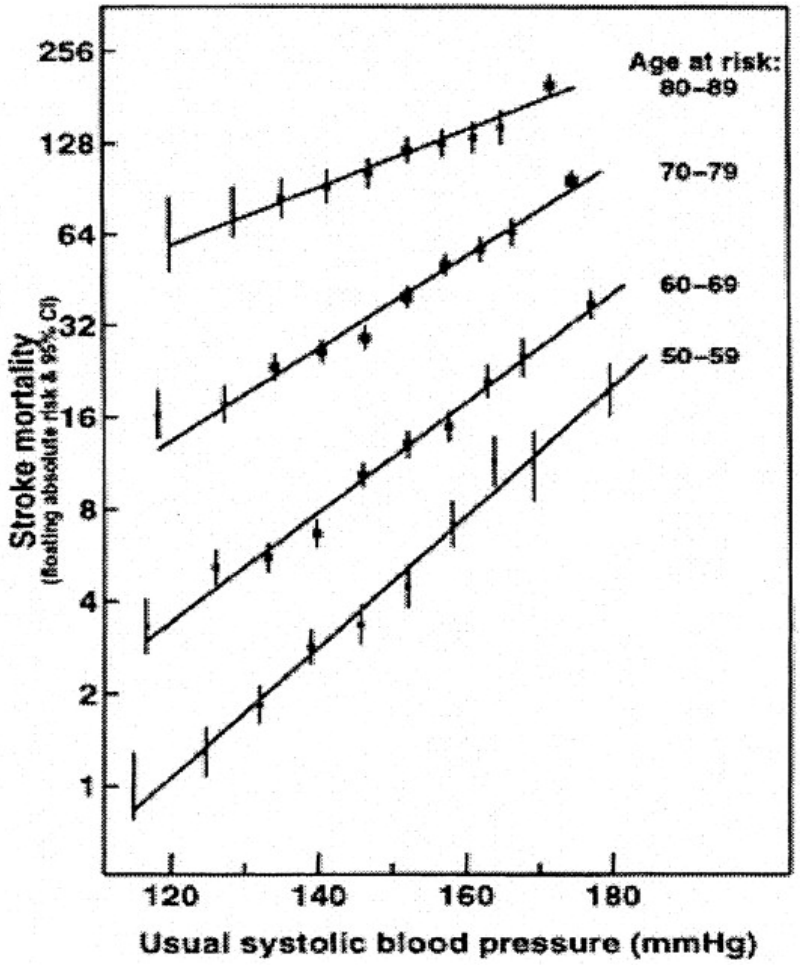


Usual SBP and risk of stroke by age
Data from prospective cohort study overviews

Asia Pacific Cohort Studies Collaboration

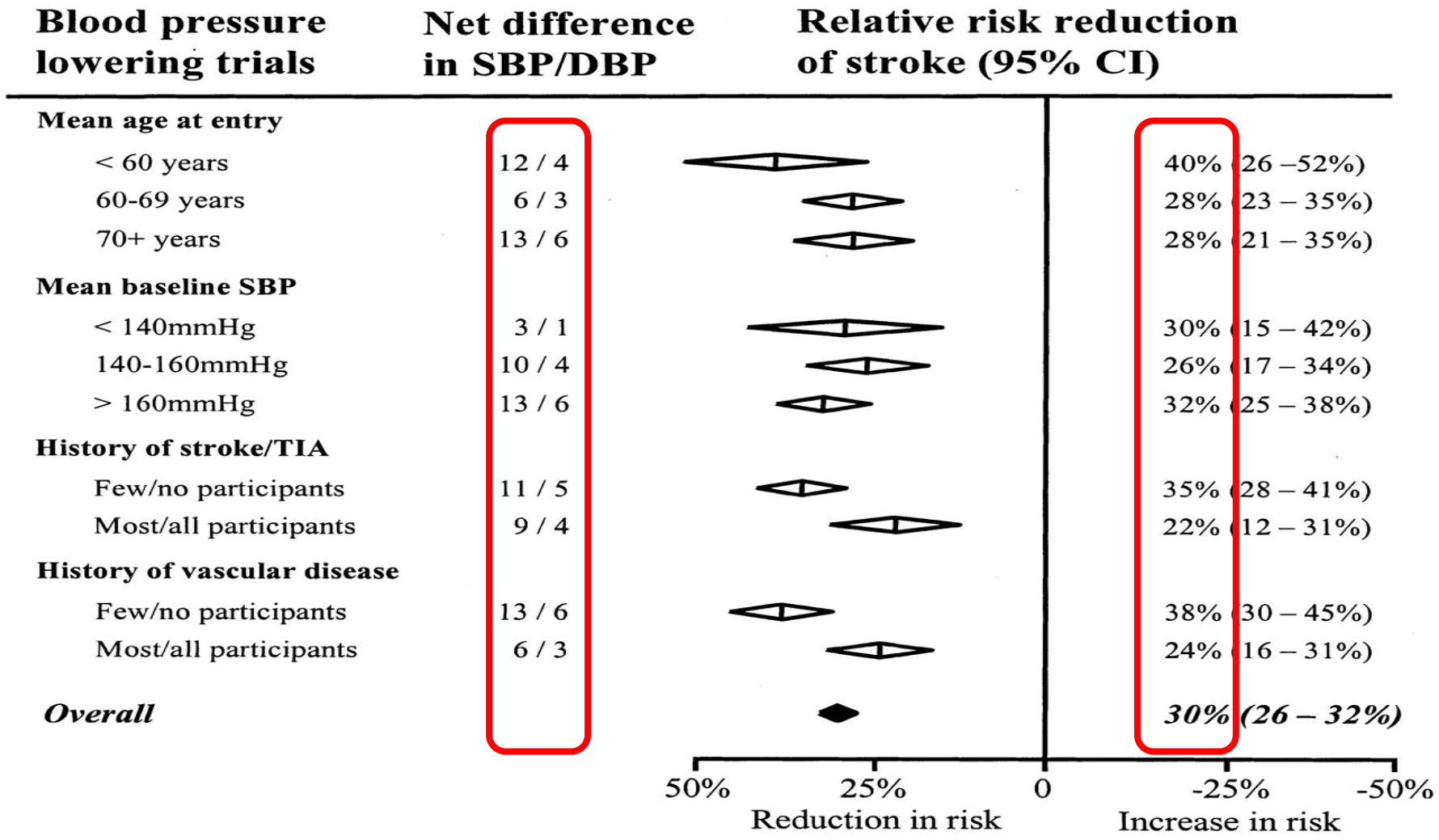


Prospective Studies Collaboration



Lawes C M et al. Stroke. 2004;35:1024-1033

Randomized controlled trials comparing antihypertensive drugs with a placebo by subgroup

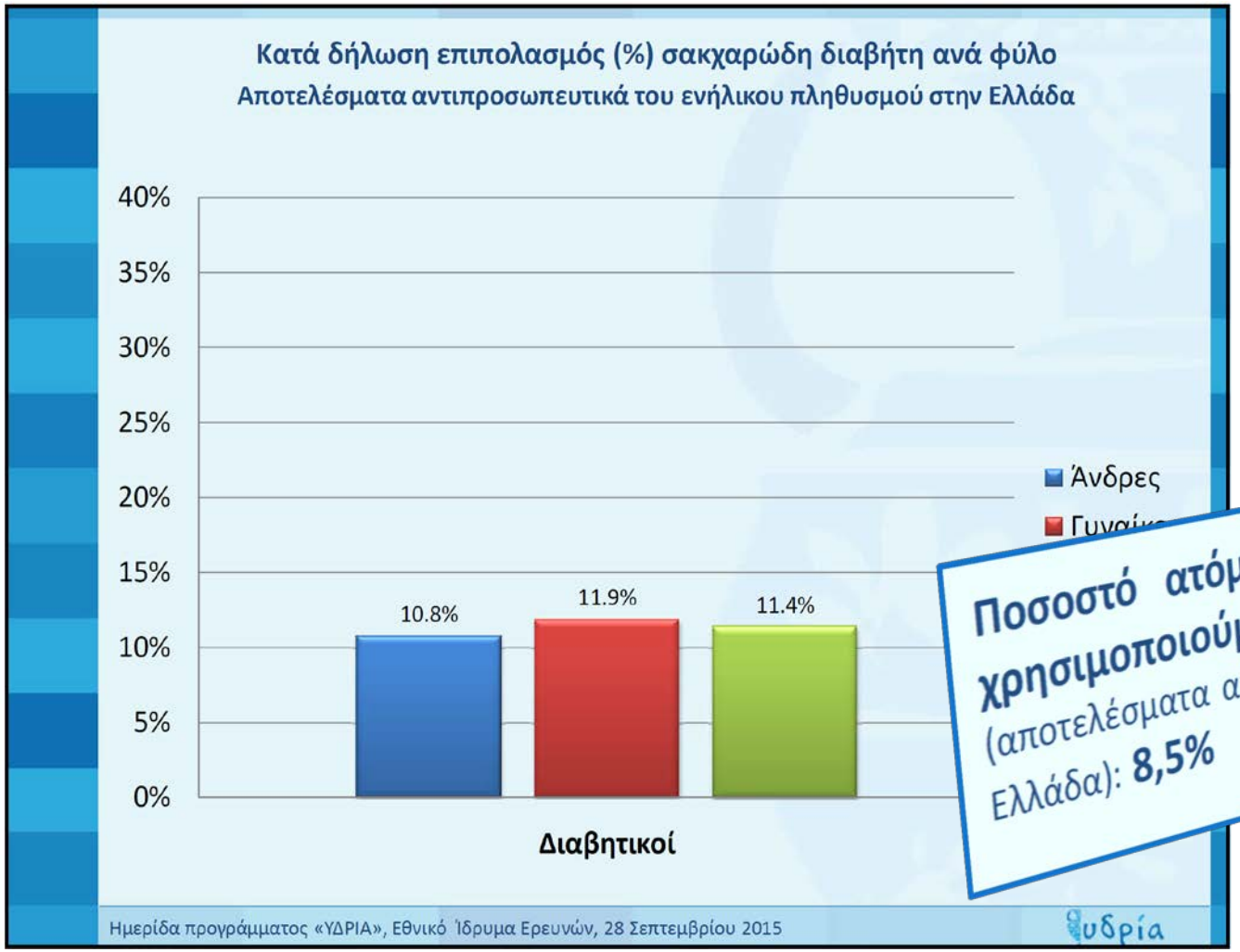


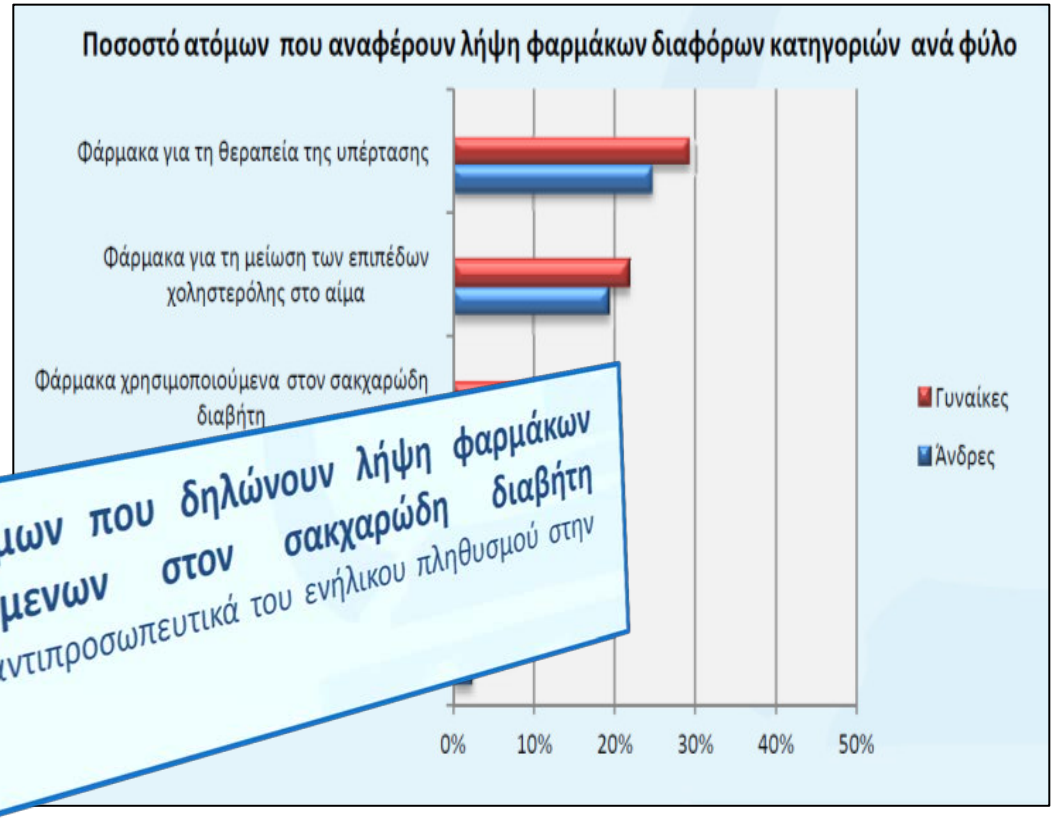
Lawes C M et al. Stroke. 2004;35:1024-1033

Hypertension Management

- Regular BP screening
  - Lifestyle modification and pharmacological therapy
  - Patients who have hypertension should be treated with antihypertensive drugs to a target BP of <140/90 mm Hg (diabetics to <130/85 mm Hg)
- **Successful reduction of BP is more important in reducing stroke risk than the choice of a specific agent**
- Self-measured BP monitoring to improve BP control

Diabetes Mellitus



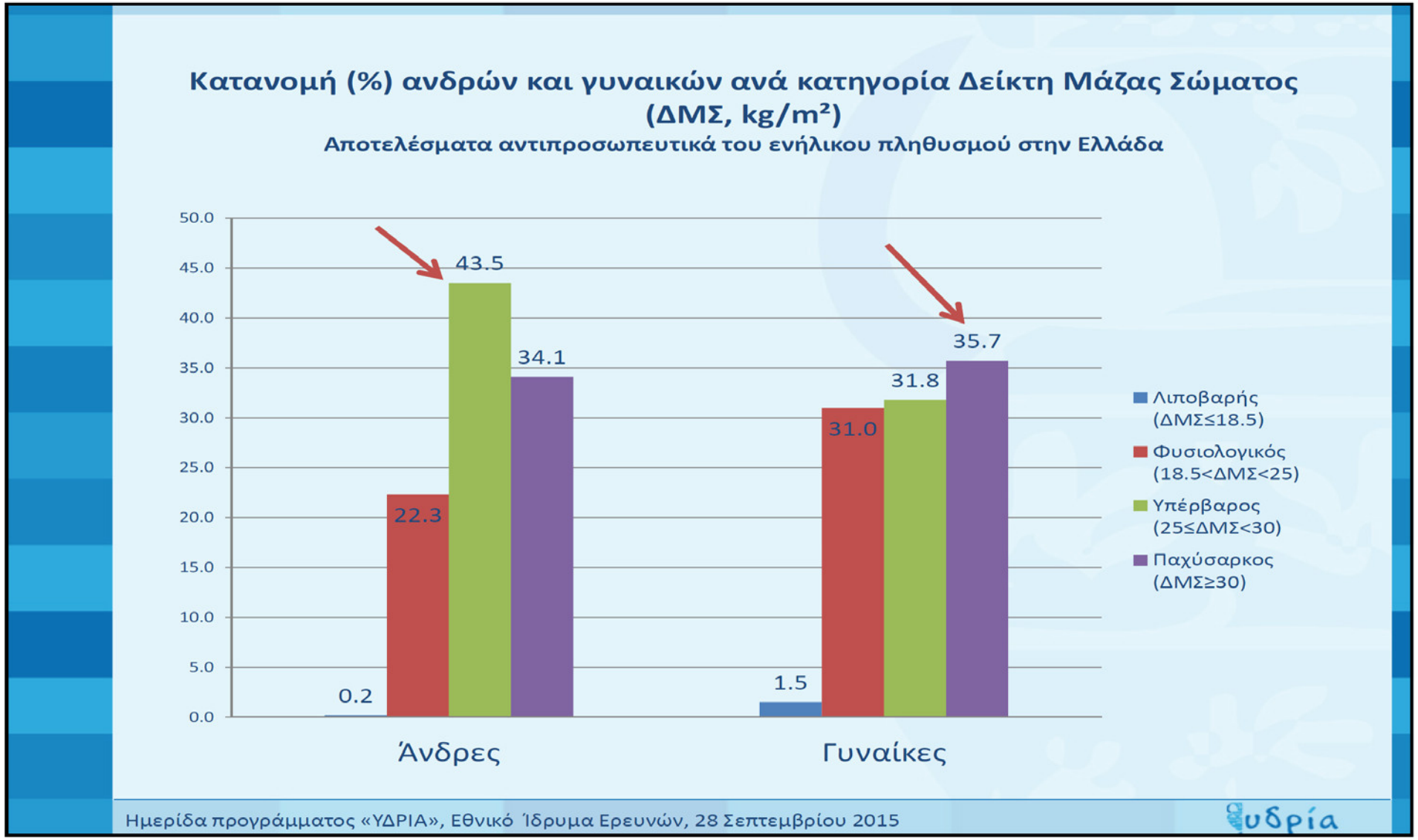


Ποσοστό ατόμων που δηλώνουν λήψη φαρμάκων χρησιμοποιούμενων στον σακχαρώδη διαβήτη (αποτελέσματα αντιπροσωπευτικά του ενήλικου πληθυσμού στην Ελλάδα): **8,5%**

Issues in Diabetes Mellitus and Stroke

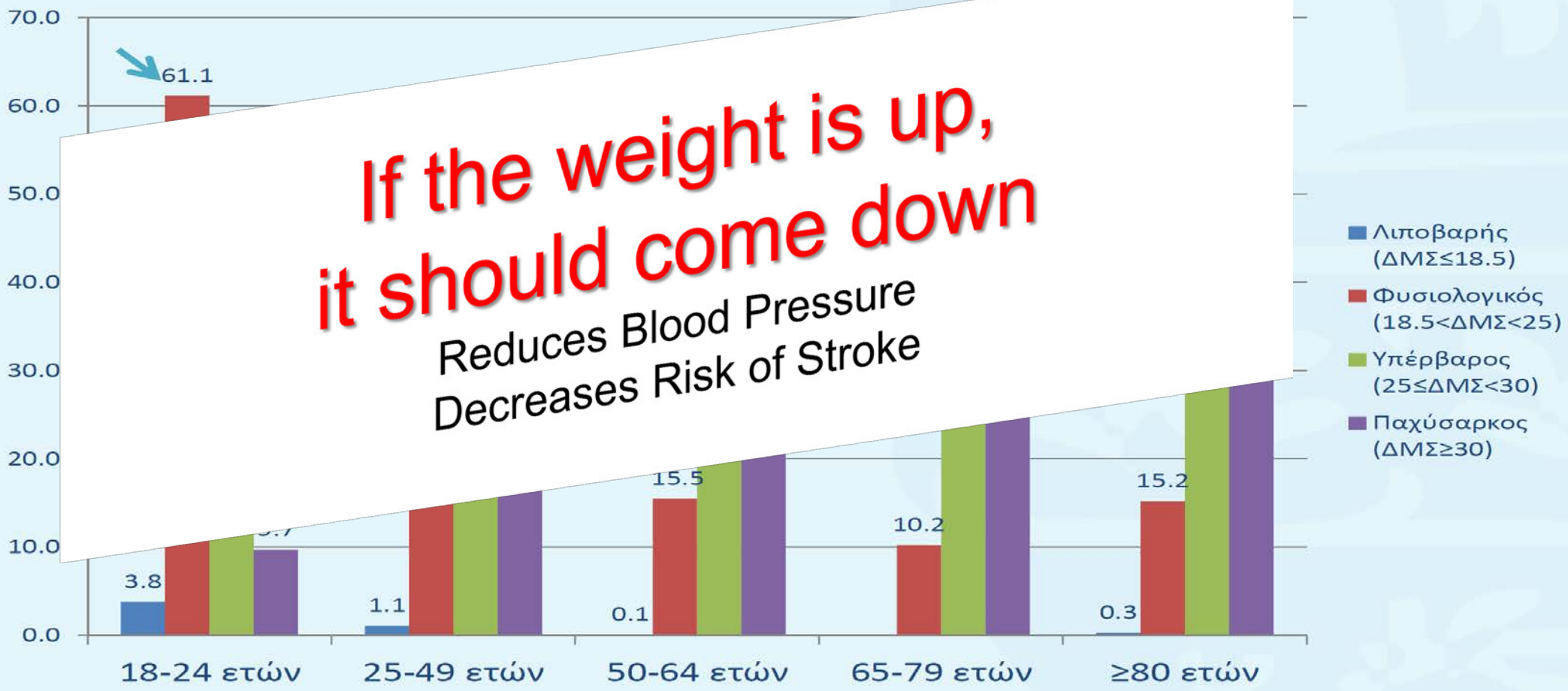
- Glycemic control
  - Reduces microvascular complications
- Tight Hypertension Control
  - A comprehensive program that includes tight control of hypertension with ACE inhibitors/ARBs reduces the risk of stroke
- Statins in Diabetes
  - Statin treatment decreases risk of stroke
  - LDL<70 mg/dL
- Diabetes, Aspirin and Stroke
  - Antithrombotic Trialists Collaboration: 287 Trials, 135, 000 patients
  - 5,126 patients with Diabetes
  - 7% reduction in risk of serious vascular events, including stroke

Obesity


Κατανομή (%) ανδρών και γυναικών ανά κατηγορία Δείκτη Μάζας Σώματος (ΔΜΣ, kg/m²)
Αποτελέσματα αντιπροσωπευτικά του ενήλικου πληθυσμού στην Ελλάδα
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
0.2
22.3
43.5
34.1
1.5
31.0
31.8
35.7
Άνδρες
Γυναίκες
Λιποβαρής (ΔΜΣ≤18.5)
Φυσιολογικός (18.5<ΔΜΣ<25)
Υπέρβαρος (25≤ΔΜΣ<30)
Παχύσαρκος (ΔΜΣ≥30)
Ημερίδα προγράμματος «ΥΔΡΙΑ», Εθνικό Ίδρυμα Ερευνών, 28 Σεπτεμβρίου 2015
Υδρία

Κατανομή (%) ατόμων ανά κατηγορία Δείκτη Μάζας Σώματος (ΔΜΣ, kg/m²) και ανά ηλικία

Αποτελέσματα αντιπροσωπευτικά του ενήλικου πληθυσμού στην Ελλάδα



If the weight is up,
it should come down

Reduces Blood Pressure
Decreases Risk of Stroke

υδρία

Cigarette Smoking

- A potent risk factor for ischemic stroke
  - Dose-response relationship
- A potent risk factor for SAH
- **Smoking contributes to 12% to 14% of all stroke deaths.**

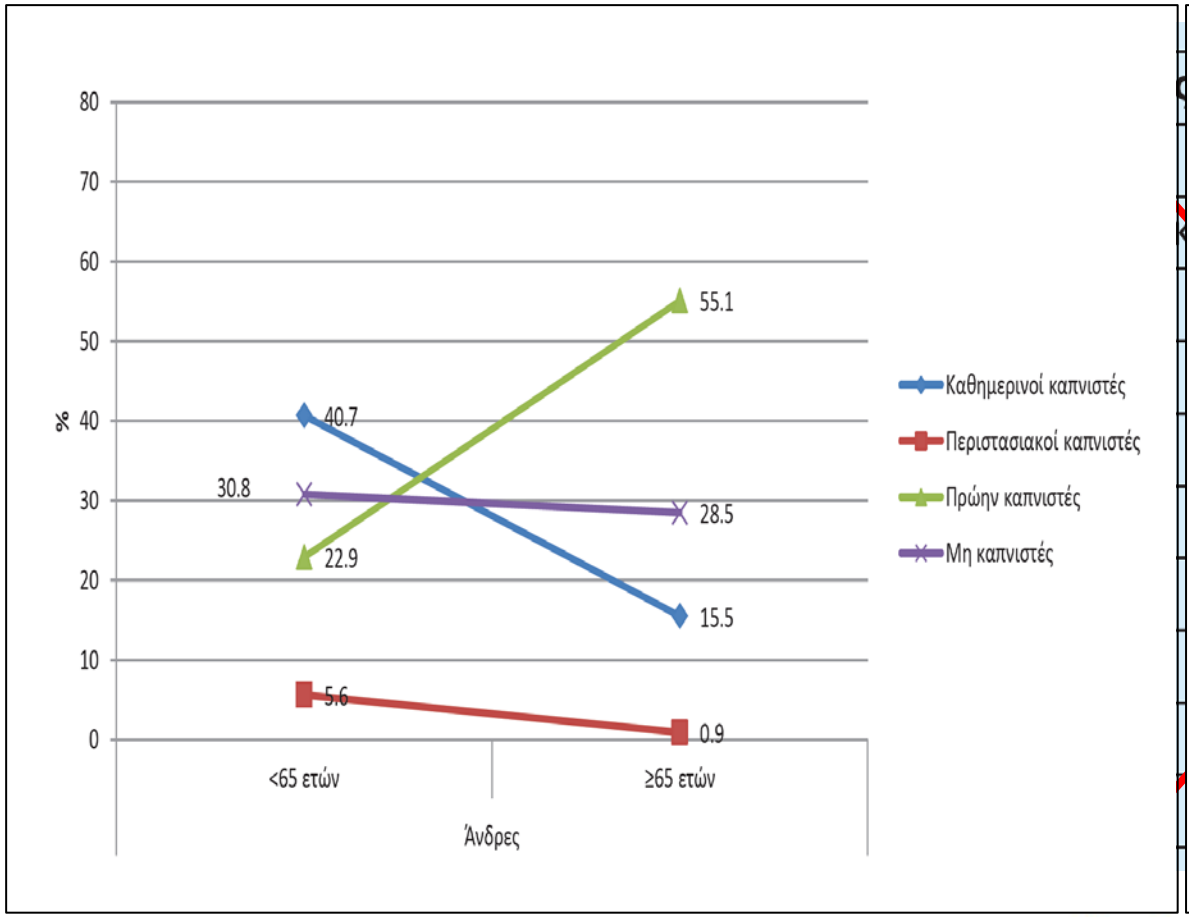
Variable	No of estimates analysed	Pooled relative risk (95% confidence interval)
Sex:		
Men	32	1·43 (1·35 to 1·52)
Women	31	1·72 (1·59 to 1·86)
Age:		
<55	11	2·94 (2·40 to 3·59)
55-74	8	1·75 (1·56 to 1·97)
≥75	6	1·11 (0·96 to 1·28)
Cigarettes/day:		
Low (mainly <10)	21	1·37 (1·24 to 1·52)
Intermediate (mainly 10-20)	20	1·45 (1·33 to 1·57)
High (>20)	33	1·82 (1·70 to 1·96)

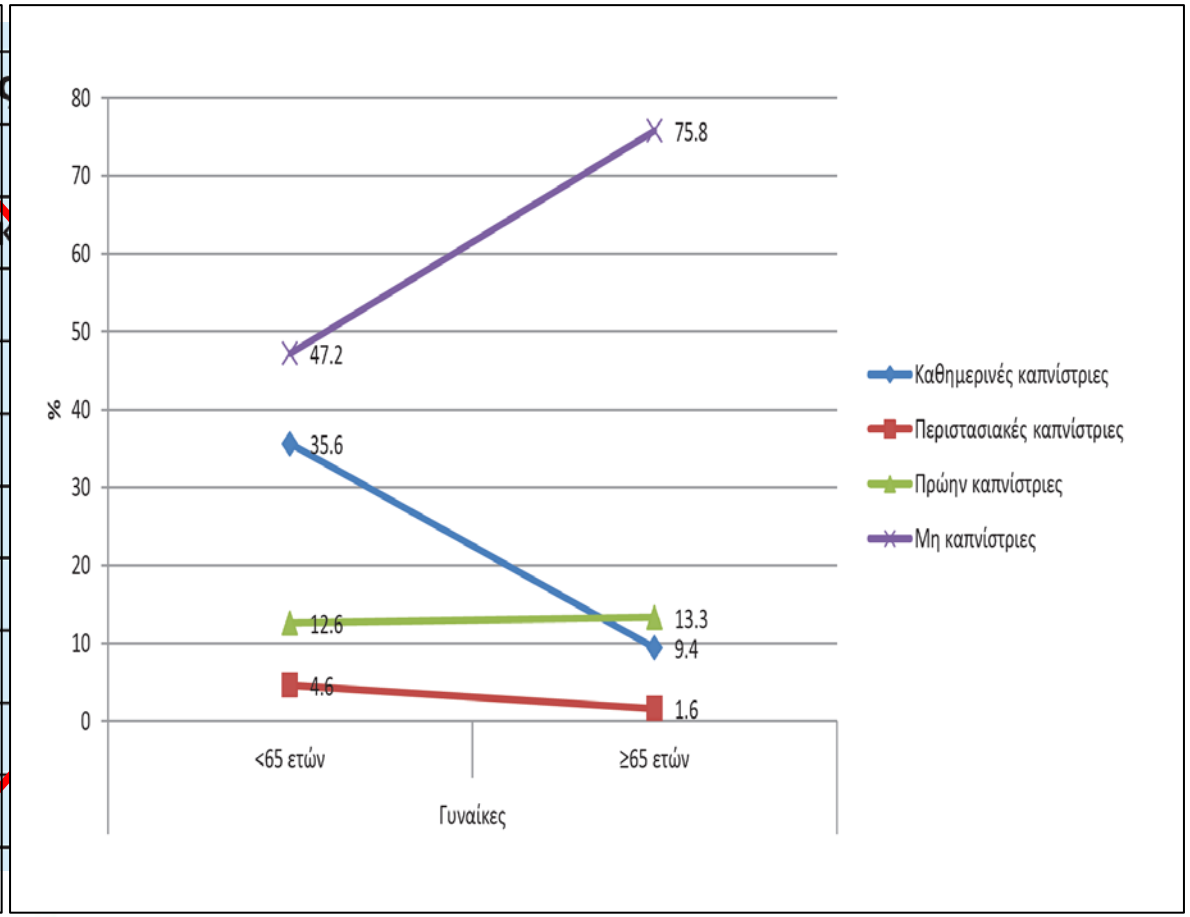
TABLE IV—*Relative risk of stroke in cigarette smokers compared with non-smokers adjusted for age and for age, blood pressure, and obesity*

Name and details of study	No of strokes	Relative risk adjusted by: Age	Age, blood pressure, and obesity
Framingham:			
Men	221	1·21	2·2
Women	238	1·30	2·5
Honolulu	288	2·10	2·5
Nurses:			
1-14 Cigarettes/day	110	2·20	2·5
15-24 Cigarettes/day	126	2·70	2·9
≥25 Cigarettes/day	123	3·70	3·8
California elderly patients:			
Men	39	1·72	2·0
Women	34	1·88	3·9
Pooled total (95% confidence interval)		1·9 (1·6 to 2·1)	2·6 (2·3 to 2·9)

Shinton & Beevers, BMJ 1989

Cigarette smoking





Ischemic stroke risk factors & subtype in the young (<45 ys) Athens Registry

Modifiable, well established risk factors							
Hypertension	56 (22.1)	46 (32.2)	10 (9.1)	< 0.001	3 (6.3)	53 (25.9)	0.003
Diabetes mellitus	20 (7.9)	15 (10.5)	5 (4.5)	0.082	2 (4.2)	18 (8.8)	0.286
Dyslipidemia	104 (41.1)	73 (51.0)	31 (28.2)	< 0.001	14 (29.2)	90 (43.9)	0.062
Smoking	150 (59.3)	98 (68.5)	52 (47.3)	0.001	23 (47.9)	127 (62.0)	0.075
Atrial fibrillation	12 (4.7)	5 (3.5)	7 (6.4)	0.288	2 (4.2)	10 (4.9)	0.835
Coronary heart disease	9 (3.6)	8 (5.6)	1 (0.9)	0.046	2 (4.2)	7 (3.4)	0.800
Heart failure	7 (2.8)	4 (2.8)	3 (2.7)	0.679	1 (2.1)	6 (2.9)	0.748
Peripheral artery disease	5 (2.0)	5 (4.1)	0 (0.0)	0.057			
History of TIA	34 (13.4)	18 (12.6)	16 (14.5)	0.651	9 (18.8)	25 (12.2)	0.231

Table 2 Ischemic stroke etiology by gender and age-group

	All (n = 252)	Males (n = 143)	Females (n = 110)	P	Age 15–30 years (n = 48)	Age 31–45 years (n = 205)	P
Etiology according to TOAST criteria							
Large artery atherosclerosis	17 (6.7)	12 (8.4)	5 (4.5)	0.226	1 (2.1)	16 (7.8)	0.154
Cardioembolism	40 (15.8)	23 (16.1)	17 (15.5)	0.892	8 (16.7)	32 (15.6)	0.857
Small-vessel disease	44 (17.4)	36 (25.2)	8 (7.3)	< 0.001	0 (0)	44 (21.5)	< 0.001
Other determined etiology	67 (26.5)	27 (18.9)	40 (36.4)	0.002	21 (43.8)	46 (22.4)	0.003
Undetermined etiology	85 (33.6)	45 (31.5)	40 (36.4)	0.414	18 (37.5)	67 (32.7)	0.525

Spengos et al, EJoN 2010

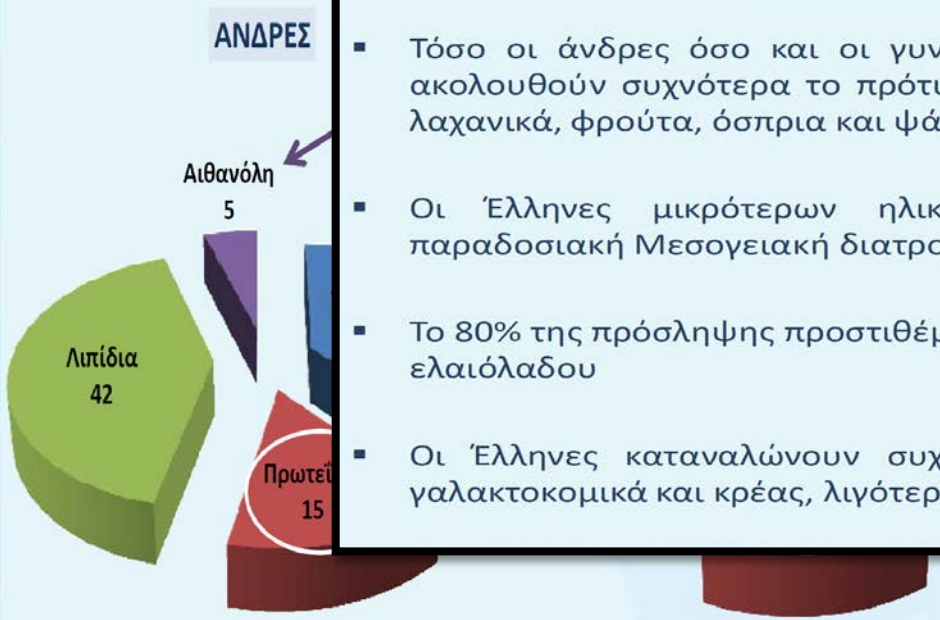
Smoking Cessation

- Counseling
- Drug therapy using:
  - Nicotine replacement
  - Bupropion, or varenicline
- Abstention from cigarette smoking
- **Community-wide or statewide bans on smoking in public spaces**

Diet and Nutrition

- A large and diverse body of evidence has implicated several aspects of diet in the pathogenesis of high BP, the major modifiable risk factor for ischemic stroke.
- Several aspects of diet lead to elevated BP, specifically:
  - excessive salt intake
  - low potassium intake
  - excessive weight
  - high alcohol consumption
  - suboptimal dietary pattern

Συνεισφορά (%) των μακροθρεπτικών συστατικών επί του συνόλου των ημερήσια προσλαμβανόμενων θερμίδων, ανά φύλο



Συνεισφορά (%) των διαφορετικών λιπαρών οξέων επί του συνόλου των ημερήσια προσλαμβανόμενων θερμίδων

Συμπεράσματα

- Τόσο οι άνδρες όσο και οι γυναίκες ηλικίας άνω των 65 ετών φαίνεται ότι ακολουθούν συχνότερα το πρότυπο της Μεσογειακής Διατροφής (περισσότερα λαχανικά, φρούτα, όσπρια και ψάρια), σε σχέση με τα νεότερα άτομα
- Οι Έλληνες μικρότερων ηλικιακών ομάδων απομακρύνονται από την παραδοσιακή Μεσογειακή διατροφή
- Το 80% της πρόσληψης προστιθέμενων λιπιδίων προέρχεται από την κατανάλωση ελαιόλαδου
- Οι Έλληνες καταναλώνουν συχνά ψωμί (και άλλα δημητριακά), λαχανικά, γαλακτοκομικά και κρέας, λιγότερα φρούτα, όσπρια και ψάρια.

Ημερίδα προγράμματος «ΥΔΡΙΑ», Εθνικό Ίδρυμα Ερευνών, 28 Σεπτεμβρίου 2015
υδρία

Relation of Traditional Mediterranean Diet to Cerebrovascular Disease

Table 3. Cox Regression-derived Hazard Ratios[a] for Incidence of and Mortality from Cerebrovascular Disease in Relation to Degree of Adherence to the Mediterranean Diet, EPIC-Greece, 1994–2009

Category of Mediterranean Diet Score	No. of Observations	No. of Incident CBVD Cases	No. of CBVD Deaths	Incidence		Mortality	
				HR	95% CI	HR	95% CI
0–3	7,627	172	89	1	Reference	1	Reference
4–5	10,182	154	74	0.80	0.64, 1.00	0.79	0.57, 1.08
6–9	5,792	69	33	0.72	0.54, 0.97	0.76	0.50, 1.16
Per 2-point increment				0.85	0.74, 0.96	0.88	0.73, 1.06

There is an inverse association of adherence to the Mediterranean diet with cerebrovascular disease incidence and mortality

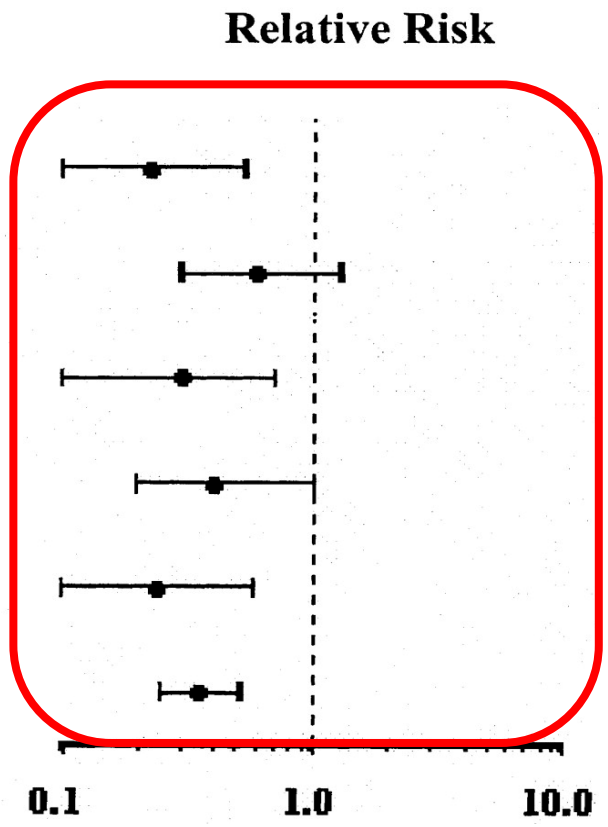
Misirli et al, Am J Epidemiol 2012

Physical Activity

- Physical inactivity is associated with numerous adverse health effects
  - Increased risk of total mortality
  - Increased risk of cardiovascular morbidity and mortality
  - Increased risk of stroke
- Physically active men and women generally have a 25% to 30% lower risk of stroke or mortality than the least active.
- The relationship between activity and stroke is not influenced by age or sex

RRs of stroke incidence for highly active individuals vs low-active individuals in 5 epidemiological case-control studies.

Study Design	Authors (Year)
Case-control studies	
	Sacco et al.[17] (1998)††
	You et al.[20] (1997)††
	You et al.[19] (1995)††
	Shinton and Sagar[18] (1993)†
	Herman et al.[21] (1983)††
	Overall



Chong Do Lee et al. Stroke. 2003;34:2475-2481

Dyslipidemia

- Most studies have found high total cholesterol to be a risk factor for ischemic stroke:
  - Multiple Risk Factor Intervention Trial (MRFIT), >350,000 men
    - RR of death resulting from non-hemorrhagic stroke increased progressively with each higher level of cholesterol.
  - Alpha-Tocopherol Beta-Carotene Cancer Prevention (ATBC) study, >28,000 smoking men
    - Risk of cerebral infarction was increased among those with total cholesterol levels of ≥271 mg/dL
  - Asia Pacific Cohort Studies Collaboration (APCSC), 352 033 individuals
    - 25% (95% CI, 13–40) increase in ischemic stroke rates for every 38.7-mg/dL increase in cholesterol.
  - Women's Pooling Project, 24,343 US women <55 years of age & Women's Health Study (WHS), 27,937 US women ≥45 years of age
    - Higher cholesterol levels were associated with increased risk of ischemic stroke

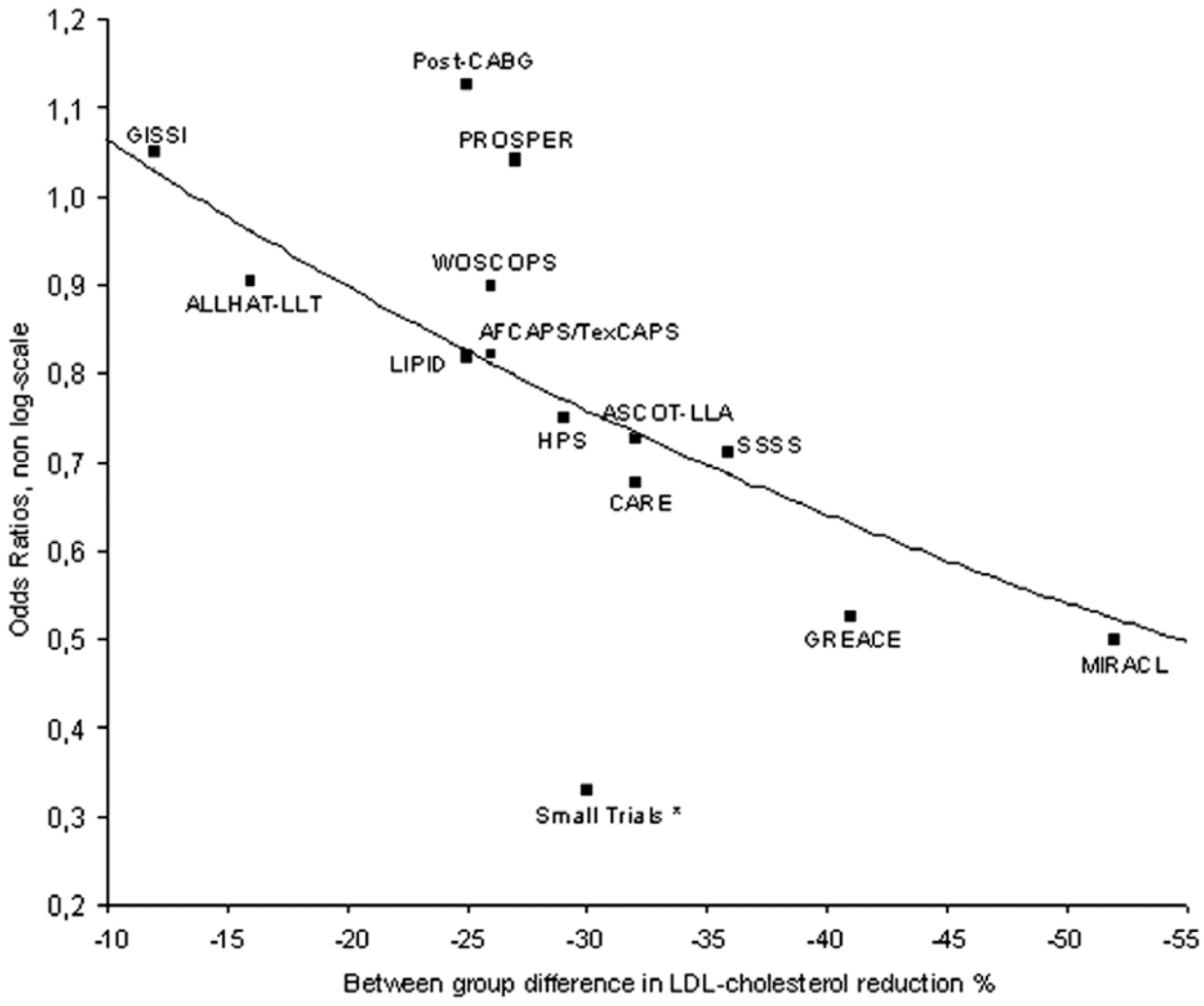
Επιπολασμός (%) υπερχοληστερολαιμίας ανά φύλο και ηλικιακή ομάδα

Αποτελέσματα αντιπροσωπευτικά του ενήλικου πληθυσμού στην Ελλάδα

	Άνδρες	Γυναίκες	Σύνολο
Συνολικός επιπολασμός	**41.9**	**40.3**	**41.1**
Ολική χοληστερόλη ≥240 mg/dl	**7.7**	**5.0**	**6.3**

Ποσοστό ατόμων που αναφέρουν λήψη φαρμάκων για μείωση επιπέδων χοληστερόλης στο αίμα: 20%

Relationship between ORs for stroke events and corresponding LDL-C reduction.



Pierre Amarenco et al. Stroke. 2004;35:2902-2909

Dyslipidemia Management

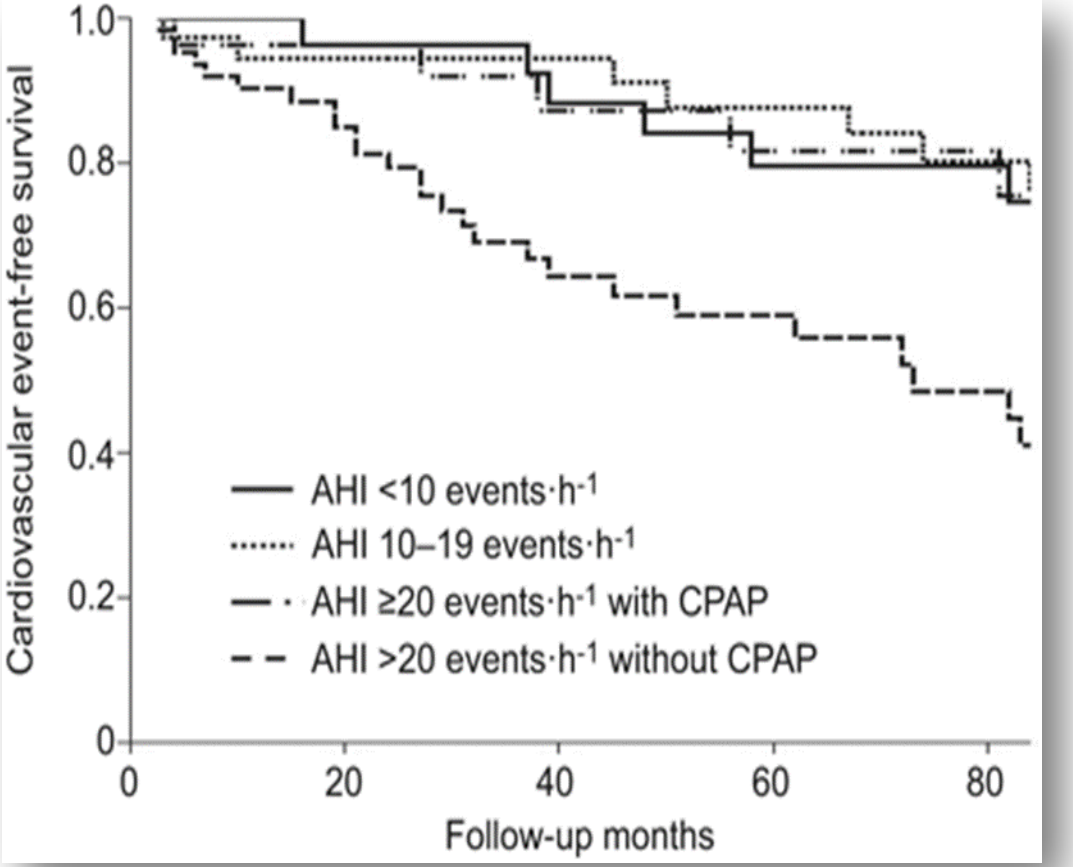
- **Therapeutic lifestyle changes:**
  - Mediterranean Diet
  - Regular exercise

- **Treatment with statins**
  - Reduces the risk of stroke in patients with or at high risk for atherosclerosis

- **No evidence that other lipid lowering therapies are effective in stroke prevention**

Obstructive sleep apnea

- OSA is present in 50%-75% of patients with stroke or TIA
- Apnea-hypopnea index(AHI) ≥ 5 events/hour
- 70%-80% are never diagnosed or treated
- Polysomnography or autotitrating CPAP devices
- 4 RCTs of CPAP in acute stroke, 3 RCTS in subacute stroke

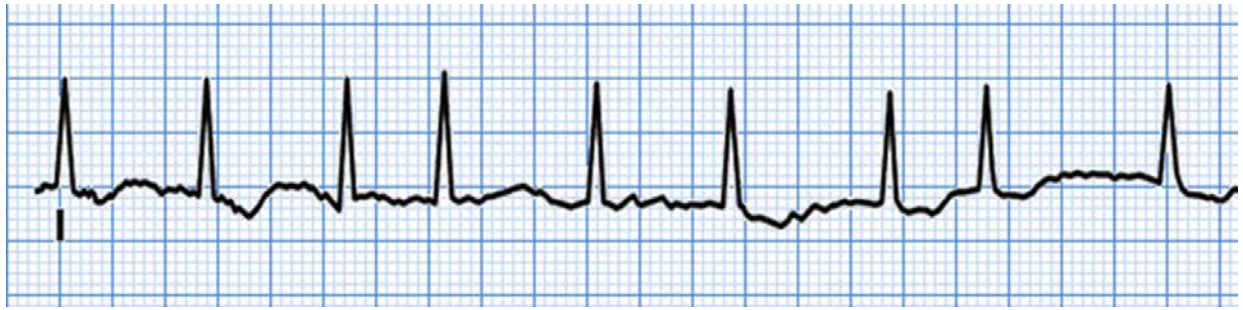


NNT to prevent 1 vascular event: 4.9

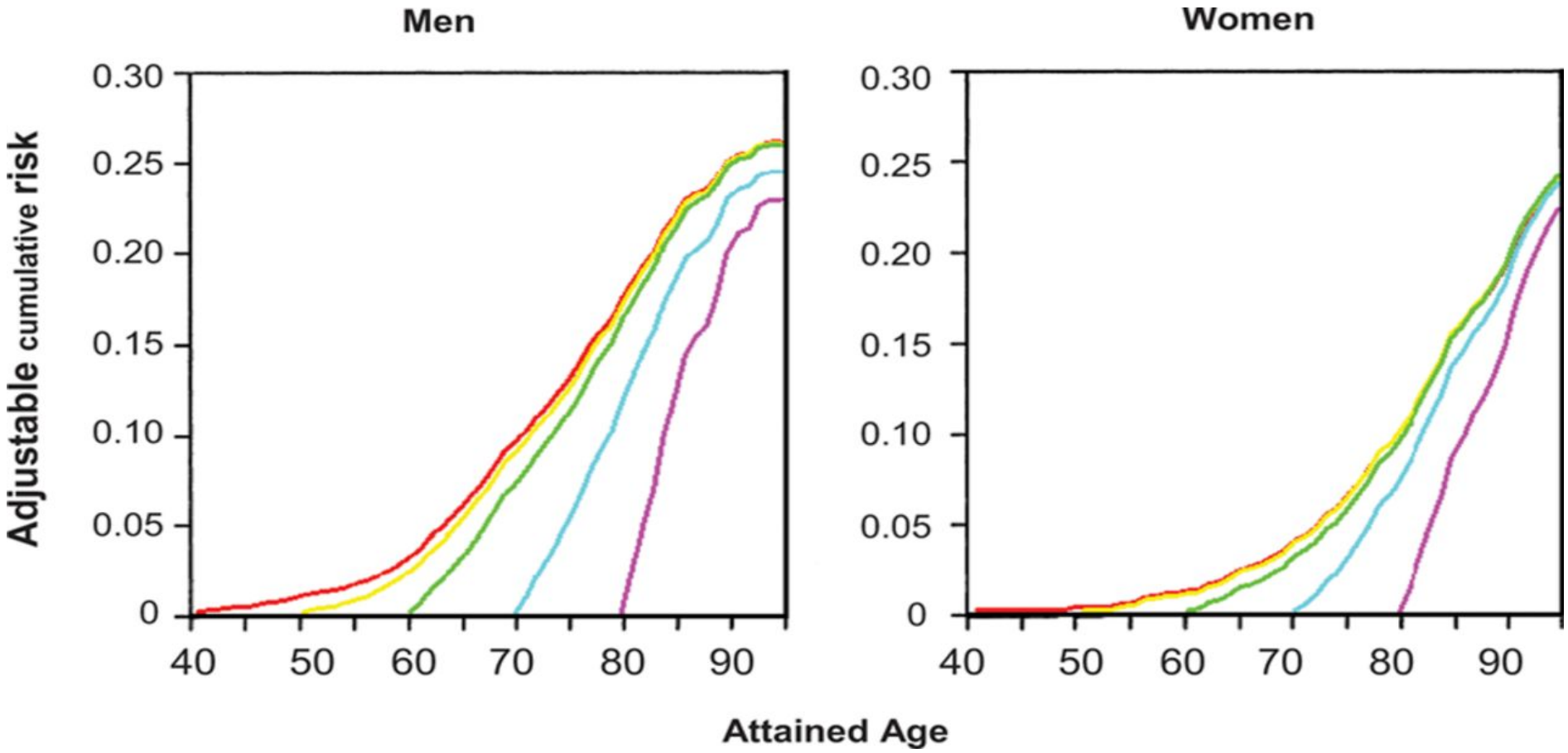
Martinez-Garcia et al. Eur Respir J 2012

Atrial Fibrillation

- AF is the most frequent etiology of cardioembolic stroke
- It becomes more prevalent with age
- Stroke is the principal adverse consequence
- In the US, AF is responsible for 10%-12% of all ischemic strokes



Lifetime risk for atrial fibrillation (AF) at different ages by sex



Dariush Mozaffarian et al. Circulation. 2015;131:e29-e322

Estimation of risk of stroke in AF

- **$CHADS_2$ score**
  - CHF, Hypertension, Age ≥ 75 years, DM, Prior stroke or TIA (2 points)

- **CHADS-Vasc (additional points)**
  - Age 65-74 years, Age ≥ 75 years (2 points), Female sex, Vascular disease

Risk of stroke (CHADS2):

0 points: 1.9%/year
1 point: 2.8%/year
2 points: 4.0%/year
3 points: 5.9%/year
4 points: 8.5%/year
5 points: 12.5%/year
6 points: 18.2%/year

Risk of stroke (CHADS-Vasc:

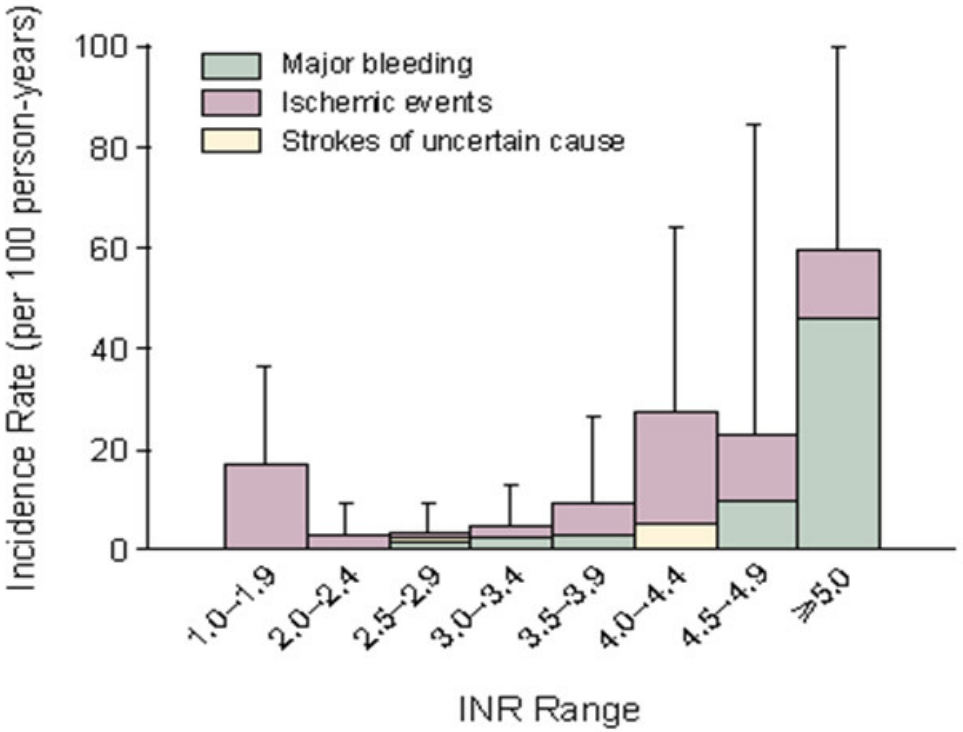
- 0 points: 0.5%/year
- 1 point: 1.5%/year
- 2 points: 2,5%/year
- 3 points: 5%/year
- 4 points: 6%/year
- 5-6 points: 7%/year

Detection of occult AF

- 10% of patients with acute ischemic stroke or TIA have new AF during hospital admission
- In additional 10-15%, AF is detected within 30 days with MCOT
- Pacemaker interrogation identified 28% incidence of occult AF
- Implantable cardiac rhythm devices identify 10-28% occult AF

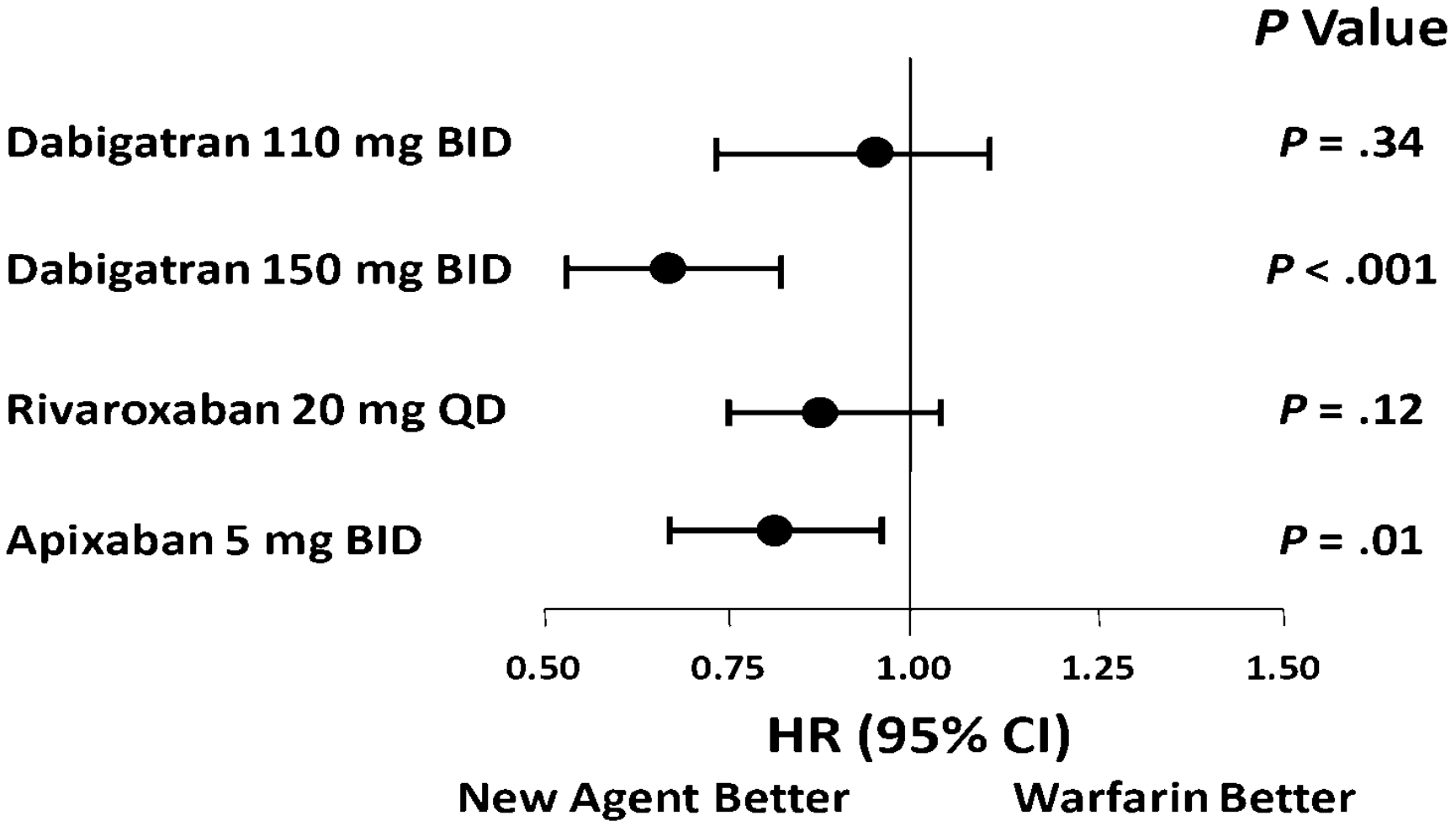
Warfarin therapy

- Multiple clinical trial established warfarin as the preferred choice for primary stroke prevention in patients with AF
- RR rate of 68%
- 32 ischemic stroke will be prevented each year for every 1000 patients treated



Direct oral anticoagulants

Stroke or Systemic Embolism



Direct oral anticoagulants

Intracranial Hemorrhage

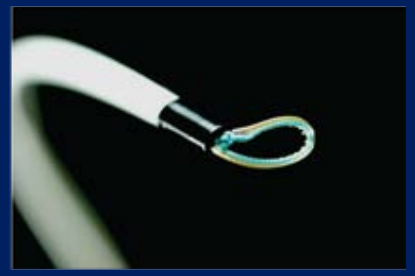
	New agent	Warfarin	relative risk reduction
Dabigatran 150mg (RE-LY)	39	90	58% (p<0.001)
Rivaroxaban (ROCKET AF)	55	84	33% (p=0.02)
Apixaban (ARISTOTLE)	52	122	58% (<0.001)

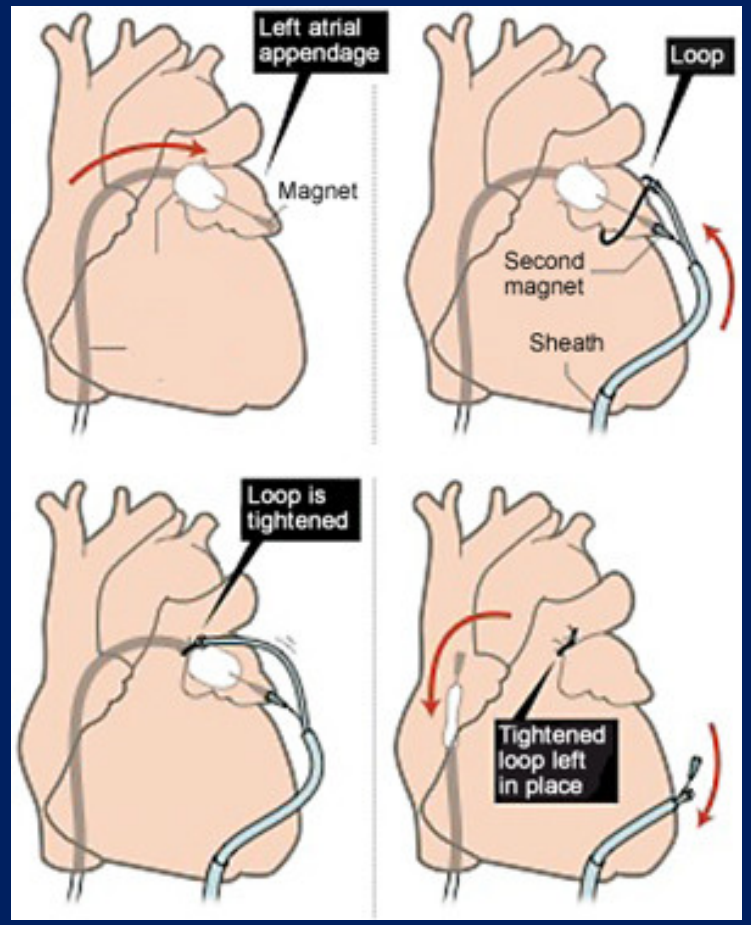
Στη καθημερινή κλινική πράξη, η αντιπηκτική θεραπεία υποχρησιμοποιείται ιδίως στους πολύ ηλικιωμένους

Αδημοσίευτες παρατηρήσεις μας στο Παν. Νοσοκομείο Ηρακλείου

- Last 100 patients with cardioembolic ischemic stroke (mean age 74 years)
- 65 were not on oral anticoagulants (despite absence of clear contraindications)
  - Aspirin
  - Clopidogrel
- 25 were with subtherapeutic INR
- Remaining were on proper anticoagulant treatment

Left Atrial Appendage Occlusion
LARIAT Procedure



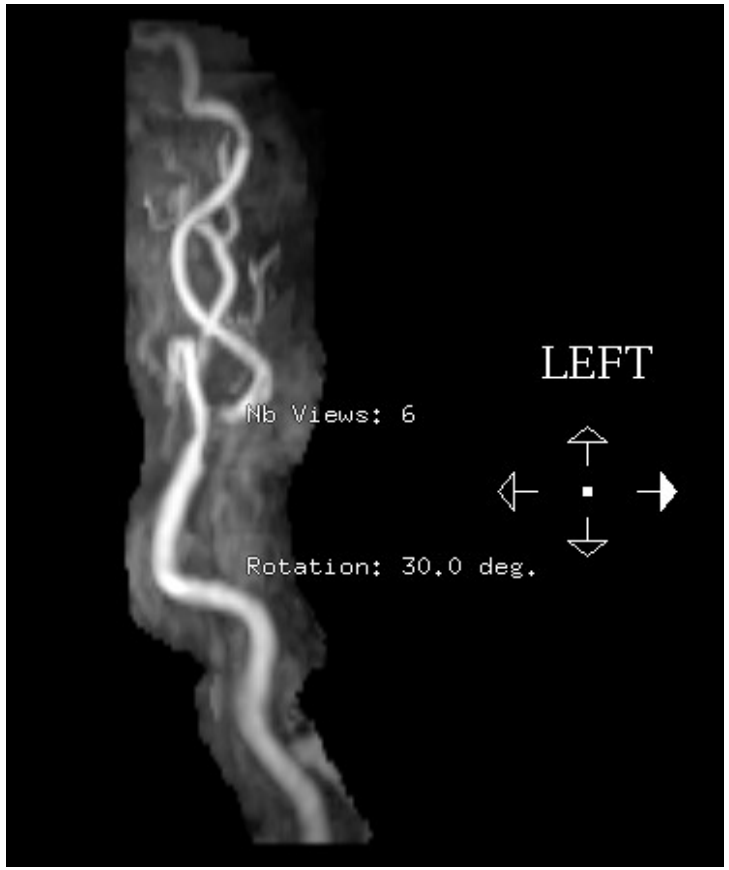


- AF is a prevalent, potent, and treatable risk factor for embolic strok
- **Despite improving public awareness, anticoagulation for suitable AF patients remains underused, particularly among the very elderly**
- A potential benefit of the newer anticoagulants would be to improve use and compliance for appropriate patients

- Another step toward optimizing the use of anticoagulants is large-scale MRI studies of cerebral microbleeds to determine whether and when they should alter the decision to prescribe anticoagulants, especially in the elderly.

Asymptomatic Carotid Artery Stenosis

- Atherosclerotic stenosis in the extracranial internal carotid artery or carotid bulb has been associated with an increased risk of stroke.
- Previous randomized trials (ACAS-1995) has shown that prophylactic carotid endarterectomy (CEA) in appropriately selected patients with carotid stenosis results in an absolute 5-year RR of 6% compared with patients treated by medical management alone
- Since these trials, medical management has improved.
- The question has been raised if invasive treatment of carotid bifurcation disease remains an effective way to reduce stroke risk compared to contemporary medical management alone
- **CREST-2 Trials**



Aspirin

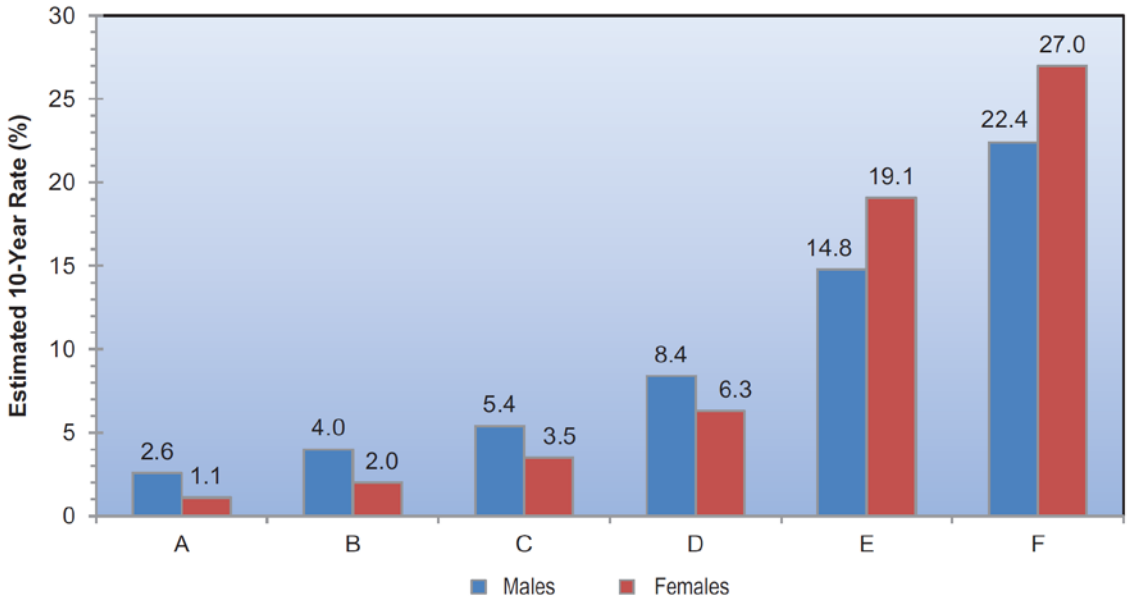
- Low dose aspirin (81 mg daily) for primary stroke prevention for those patients with high 10 year risk of stroke

Assessing the risk of first stroke

- An ideal stroke risk assessment tool that is simple, widely applicable and accepted, and takes into account the effects of multiple risk factors does not exist.
- Each available tool has limitations
- Newer risk factors for stroke such as OSA, not collected in older studies, need to be considered.
- Some potential for harm exists from unnecessary application of interventions that may result from inappropriate use of risk assessment tools or from the use of poorly adjudicated tools.

Estimated 10-year stroke risk in adults aged 55 according to levels of various risk factors

Framingham Heart Study



	A	B	C	D	E	F
Blood Pressure*	95-105	138-148	138-148	138-148	138-148	138-148
Diabetes	No	No	Yes	Yes	Yes	Yes
Cigarette Smoking	No	No	No	Yes	Yes	Yes
Prior AF	No	No	No	No	Yes	Yes
Prior CVD	No	No	No	No	No	Yes

Δευτερογενής Πρόληψη ΑΕΕ

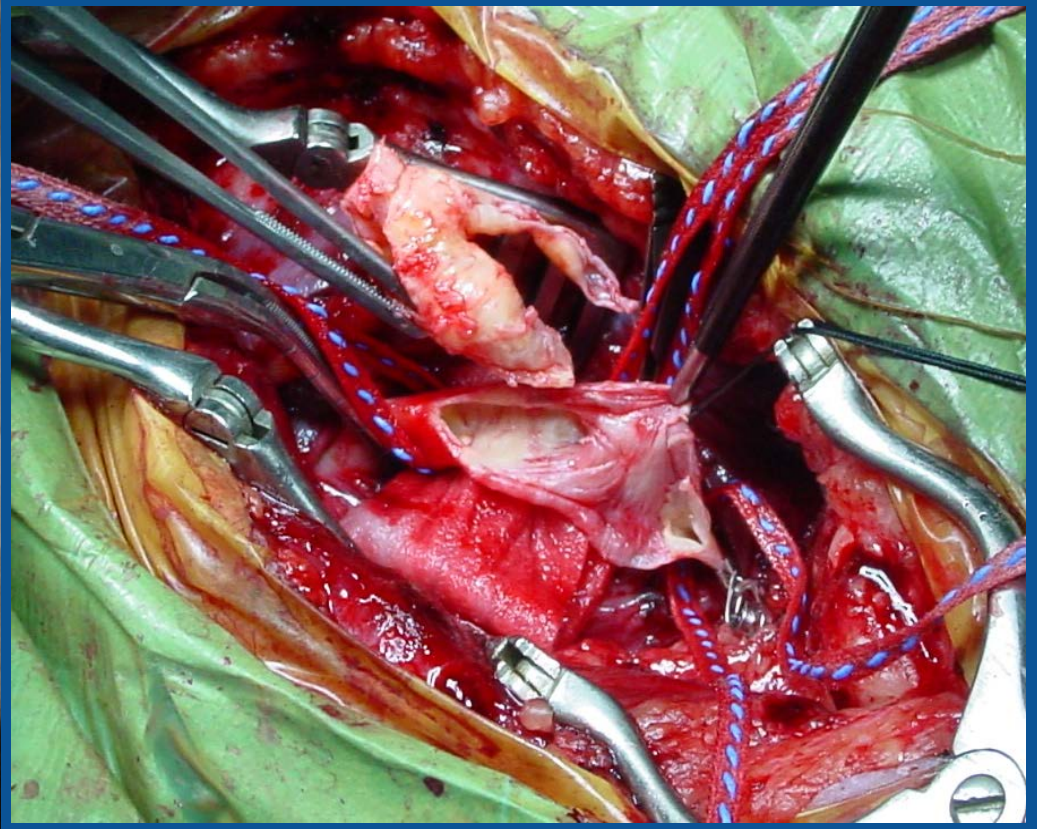
Recurrent Stroke

- Recurrent stroke is associated with a greater number of risk factors and higher incidence of large artery atherosclerosis than the first stroke
- Recurrent stroke carries a more severe disability and higher mortality rate
- Recurrent stroke rates (South Carolina registry, 10,399 participants):
  - 1 month: 1.8%
  - 6 month: 5%
  - 1 year: 8%
  - 4 years: 18%
- 70% of recurrent strokes are of same subtype

Secondary Stroke Prevention

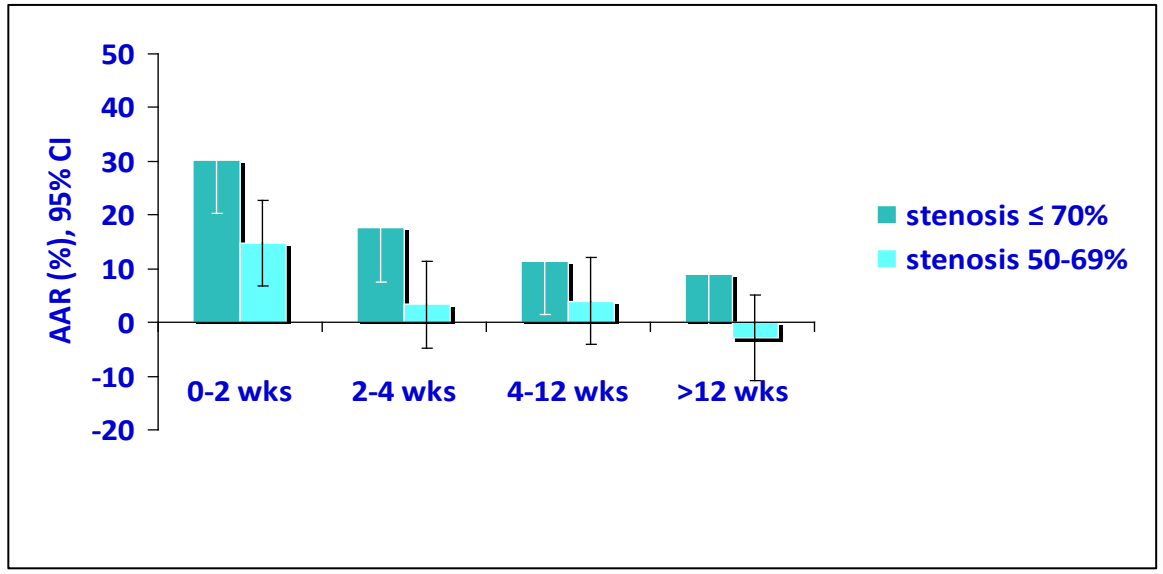
- Strict Risk Factor Control, including:
  - LDL<70 mg/dL
  - BP <140/90 mm Hg
- Antithrombotic Medications:
  - Aspirin 325 mg daily or equivalent antiplatelet
    - Double antiplatelets for patients with symptomatic intracranial arterial stenosis
  - Oral anticoagulants for Atrial Fibrillation
- Carotid Revascularization Surgery
  - Carotid Endarterectomy vs Carotid Angioplasty and Stenting

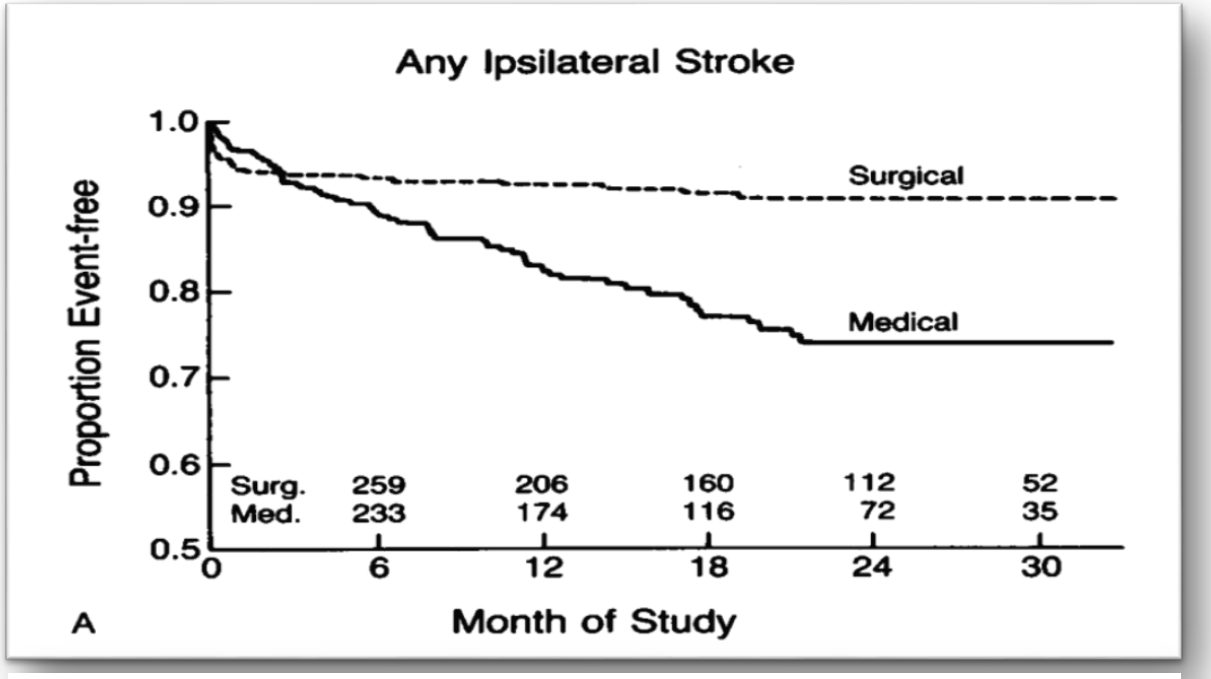
S
left bifurcation
Obl
I

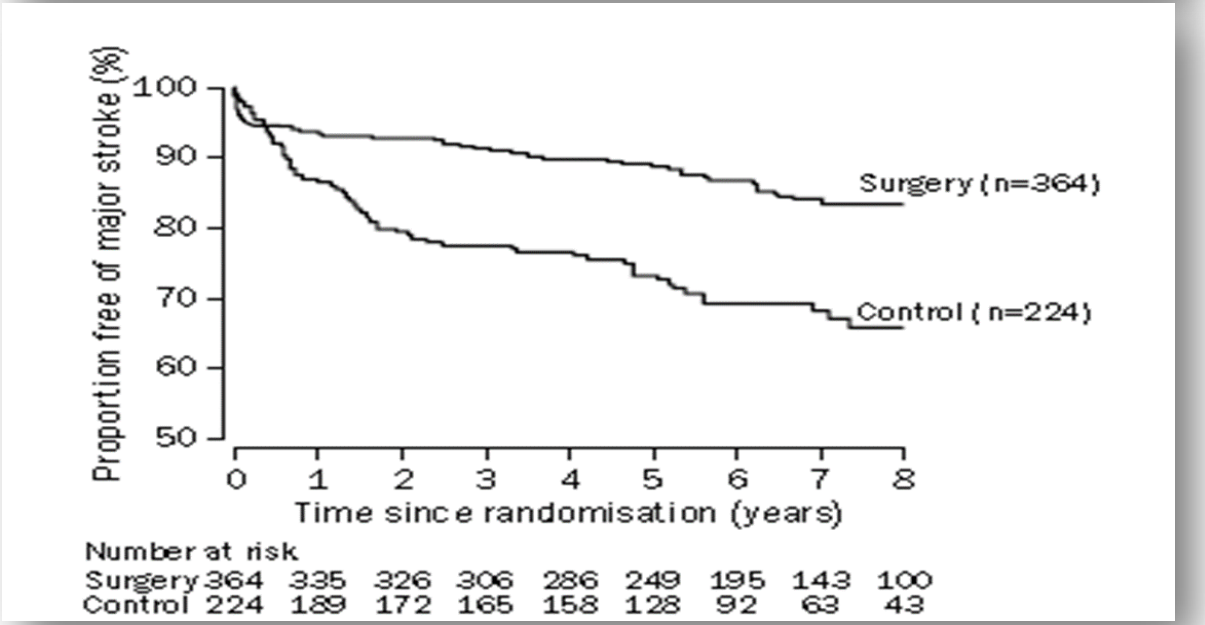


CEA for Symptomatic Carotid Artery Stenosis

- Three major randomized clinical trials
- 30-day stroke and death rate: 6.5%
- Superiority of CEA & medical therapy over medical therapy alone for >70% stenosis
- No benefit for CEA for <50% stenosis
- Role for CEA in 50-69% stenosis is less clear



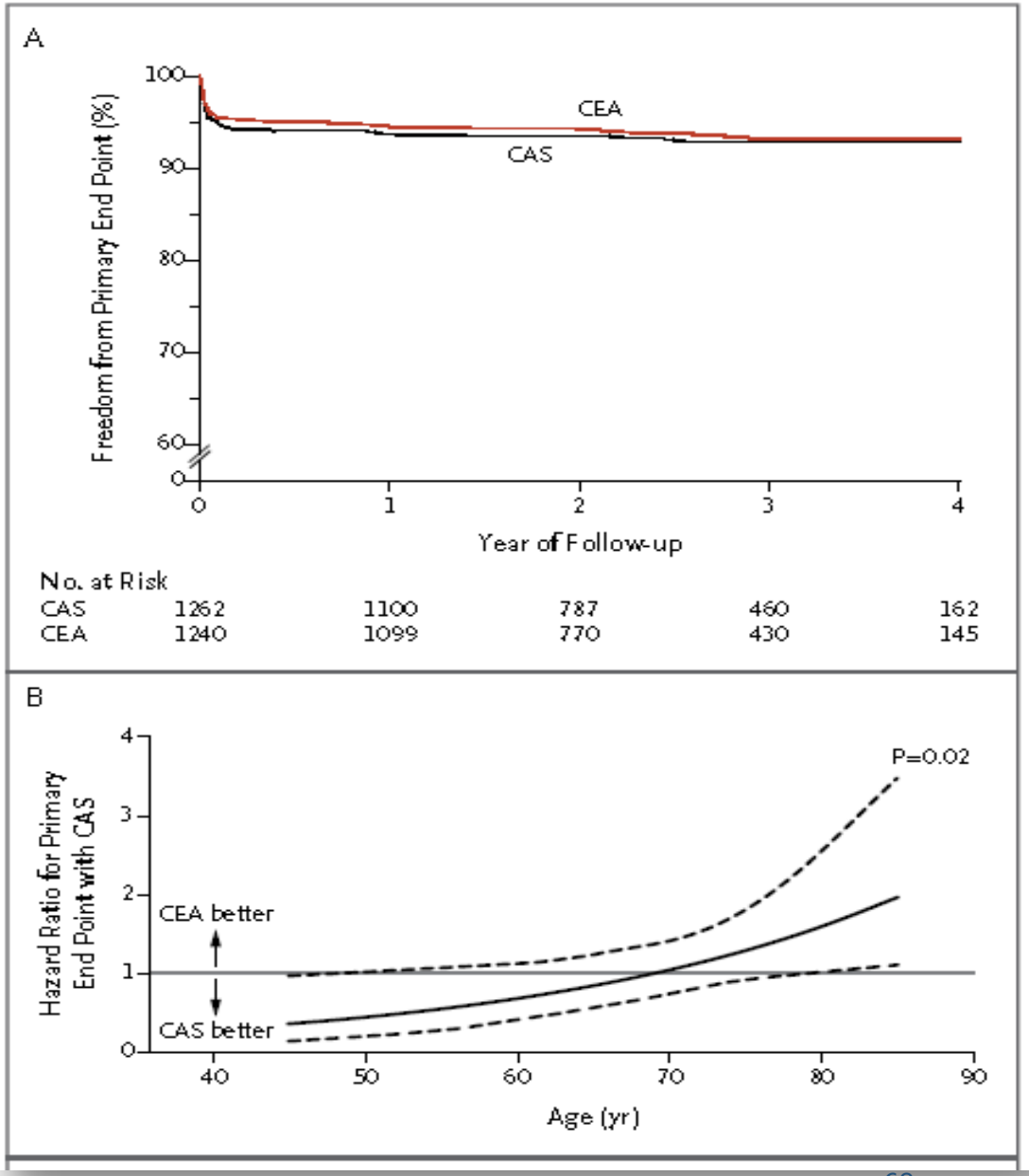




CAS may be Equivalent to CEA

CREST trial, 2010

- No difference in estimated 4-year rates of combined stroke-MI-death between CAS and CEA group
  - 7.2% vs. 6.8%
- 4-year rate of stroke or death was 6.4% vs. 4.7% (CAS vs. CEA)
  - HR, 1.50; P = 0.03
- Among symptomatic patients 8.0% CAS and 6.4% CEA
  - HR, 1.37; P = 0.14



Κύρια Μηνύματα

- Τα ΑΕΕ είναι μία σύγχρονη προσωπική, ιατρική και κοινωνική μάστιγα
- Είναι η κύρια αιτία μείζονος αναπηρίας και μία από τις κύριες αιτίες θανάτου
- Οι επείγουσες θεραπείες (θρομβόλυση και θρομβεκτομή) έχουν την δυνατότητα να ελαχιστοποιήσουν τις συνέπειες των ΑΕΕ αλλά χρησιμοποιούνται σε λιγότερο από 5% των ασθενών
- Έμφαση στην πρόληψη τους (πρωτογενής πρόληψη) και τη πρόληψην των υποτροπών τους.
- Η πρόληψη των ΑΕΕ είναι δύσκολη και πολύ-επίπεδη και στηρίζεται σε τρείς πυλώνες:
  - Αυστηρός έλεγχος των τροποποιήσιμων παραγόντων κινδύνου
  - Φαρμακευτική θεραπεία
  - Επεμβατικές θεραπείες

Προτάσεις για πρόληψη ΑΕΕ στον Ελληνικό χώρο

- **Εκπαίδευση και επιμόρφωση:**
  - Ιατρική εκπαίδευση
  - Επιμόρφωση πληθυσμού
  - Αναγνώριση και πρώιμη θεραπεία ομάδων υψηλού κινδύνου
- **Αξιοποίηση υπάρχοντος δικτύου γενικών ιατρών:**
  - Ηλεκτρονικό Αρχείο Υγείας σε επίπεδο Περιφερειών ή Εθνική Κλίμακα
  - Συγκεκριμένα πρωτόκολλα διάγνωσης, εκτίμησης κινδύνου και θεραπείας
- **Ιατρεία Πρόληψης ΑΕΕ σε κάθε δομή Τριτοβάθμιας Περίθαλψης**
- **Ευθύνη:**
  - Ευθύνη ιατρών
  - Ευθύνη συστήματος υγείας
  - Ευθύνη ασθενών

Eur J Epidemiol
DOI 10.1007/s10654-015-0007-8

OBITUARY

In memoriam Dimitrios Trichopoulos: an argonaut in search of the golden fleece of medicine (1938–2014)

Pagona Lagiou

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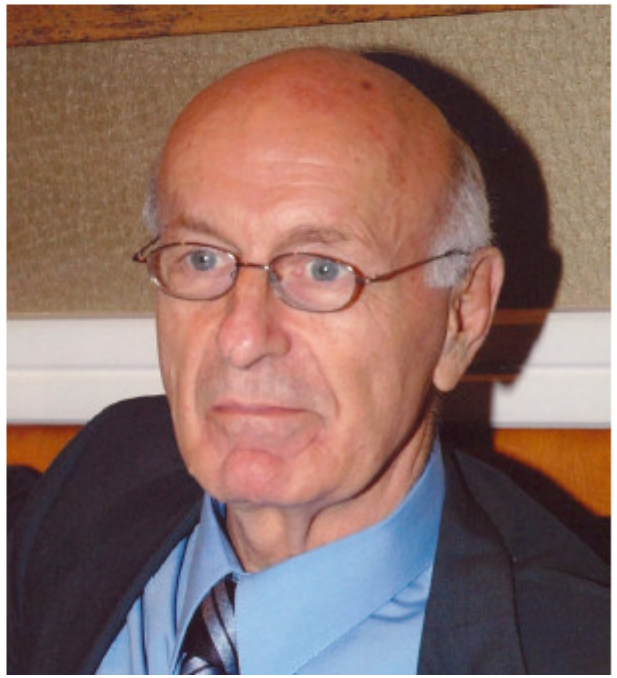
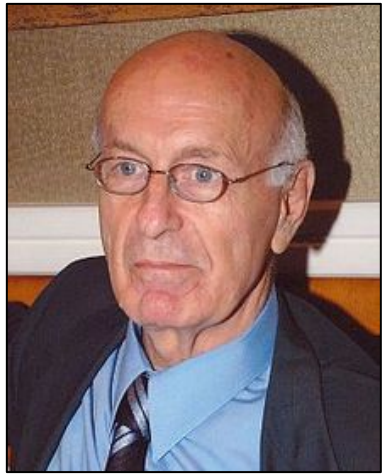
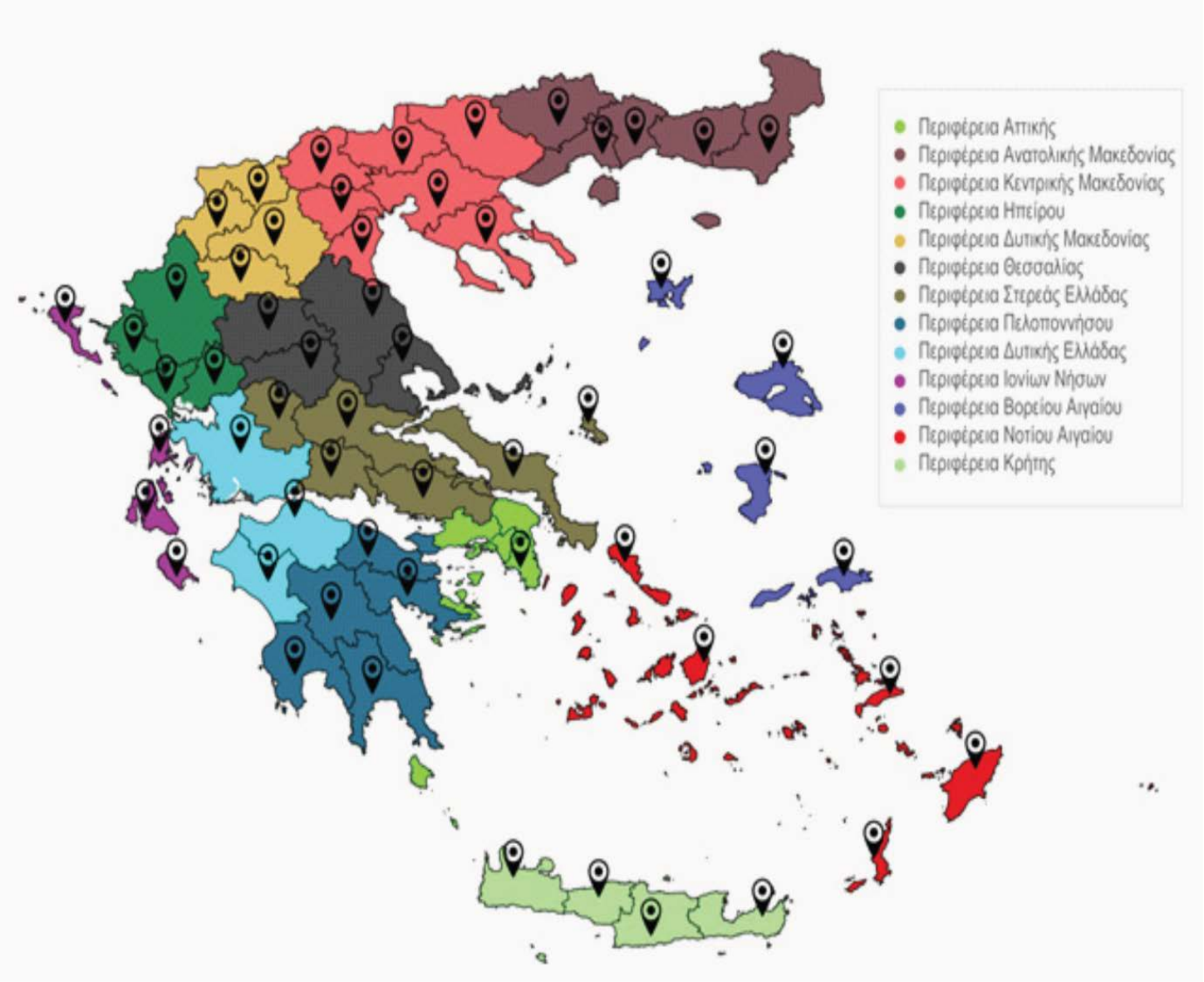


On December 1, 2014, the epidemiology community bade farewell to one of its most distinguished members. Dimitrios Trichopoulos passed away leaving several colleagues and students in both sides of the Atlantic and all over the world saddened by the loss of a great scientist, mentor and friend. Dimitrios Trichopoulos was Professor of Cancer Prevention and Professor of Epidemiology at the Harvard School of Public Health, Member of the Athens Academy and President of the Hellenic Health Foundation in Greece. He had served as director of the Harvard Center for Cancer Prevention; chairman of the Epidemiology Departments at the University of Athens and at Harvard; and adjunct professor of medical epidemiology at the Karolinska Institute in Sweden. He had published the first study linking passive smoking to lung cancer, had done early work on the association of hepatitis B and C infections and tobacco smoking with hepatocellular carcinoma, and conducted key studies on the role of intrauterine exposures in breast cancer etiology. He received several awards and distinctions, including honorary Doctorates, the Brinker International Award for Breast Cancer Clinical Research, the Julius Richmond Award for the documentation of the role of involuntary



υδρία

ΔΙΑΤΡΟΦΗ & ΥΓΕΙΑ ΤΟΥ ΕΛΛΗΝΙΚΟΥ ΠΛΗΘΥΣΜΟΥ



Το δείγμα της μελέτης ΥΔΡΙΑ δεν παρουσιάζει μεγάλες διαφοροποιήσεις από την κατανομή του πληθυσμού της Ελλάδας ως προς το φύλο και την ηλικία

Ευρωπαϊκό Πρόγραμμα συνεργασίας Ιατρικής & Κοινωνίας (ΕΠΙΚ)

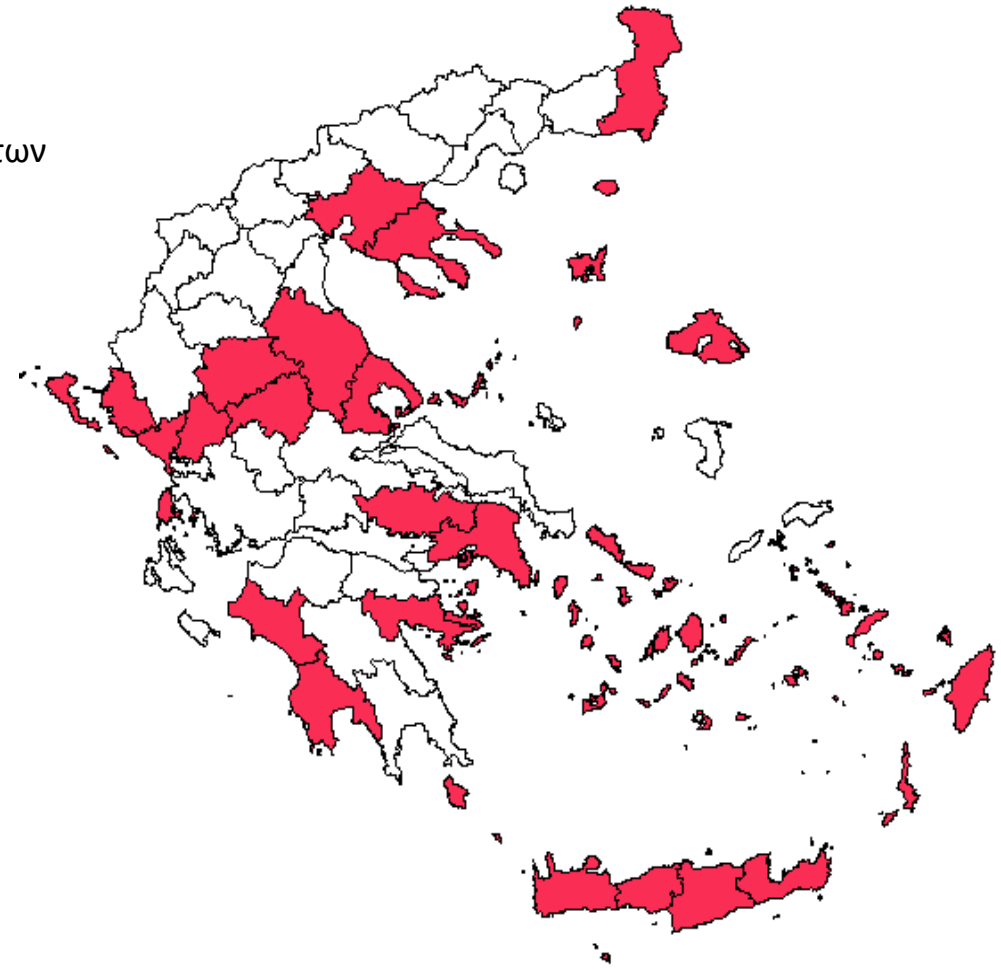
1992-93: Προκαταρκτική φάση (pilot study)

1994-99: Στρατολόγηση εθελοντών (recruitment)

1997- : Παρακολούθηση της υγείας των εθελοντών (follow-up)

Διαχρονική παρακολούθηση

-------(Follow-up)----------



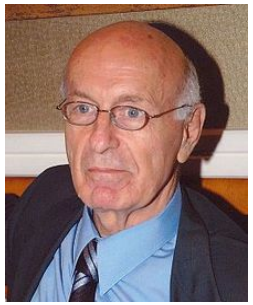
28.572 άτομα, άνδρες & γυναίκες,

Πολλές περιοχές της Ελλάδας

Ευρύ κοινωνικο-δημογραφικό φάσμα

Μετα-στρωματοποίηση

Υπολογισμός σταθμισμένων ποσοστών



Stroke Kills
Stroke disables

Κάλλιον προλαμβάνειν ή θεραπεύειν

- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden, severe headache with no known cause