Secondary prevention medications for CVD in 628 communities from 17 high, middle and low income countries

The Prospective Urban Rural Epidemiologic (PURE) study

Salim Yusuf on behalf of the PURE investigators

Duality of Interests

None to declare with regards this presentation

Background

- Antiplatelet drugs, betablockers, ACE-I/ARBs and statins reduce MI, stroke and death in CHD; and these interventions and BP lowering reduces stroke after a cerbro-vascular event.
- Most studies regarding the use of these drugs are hospital based or among patients followed by physicians, but not from the ***community***.
- Little information from low and middle income countries, where >80% of global CVD occurs.

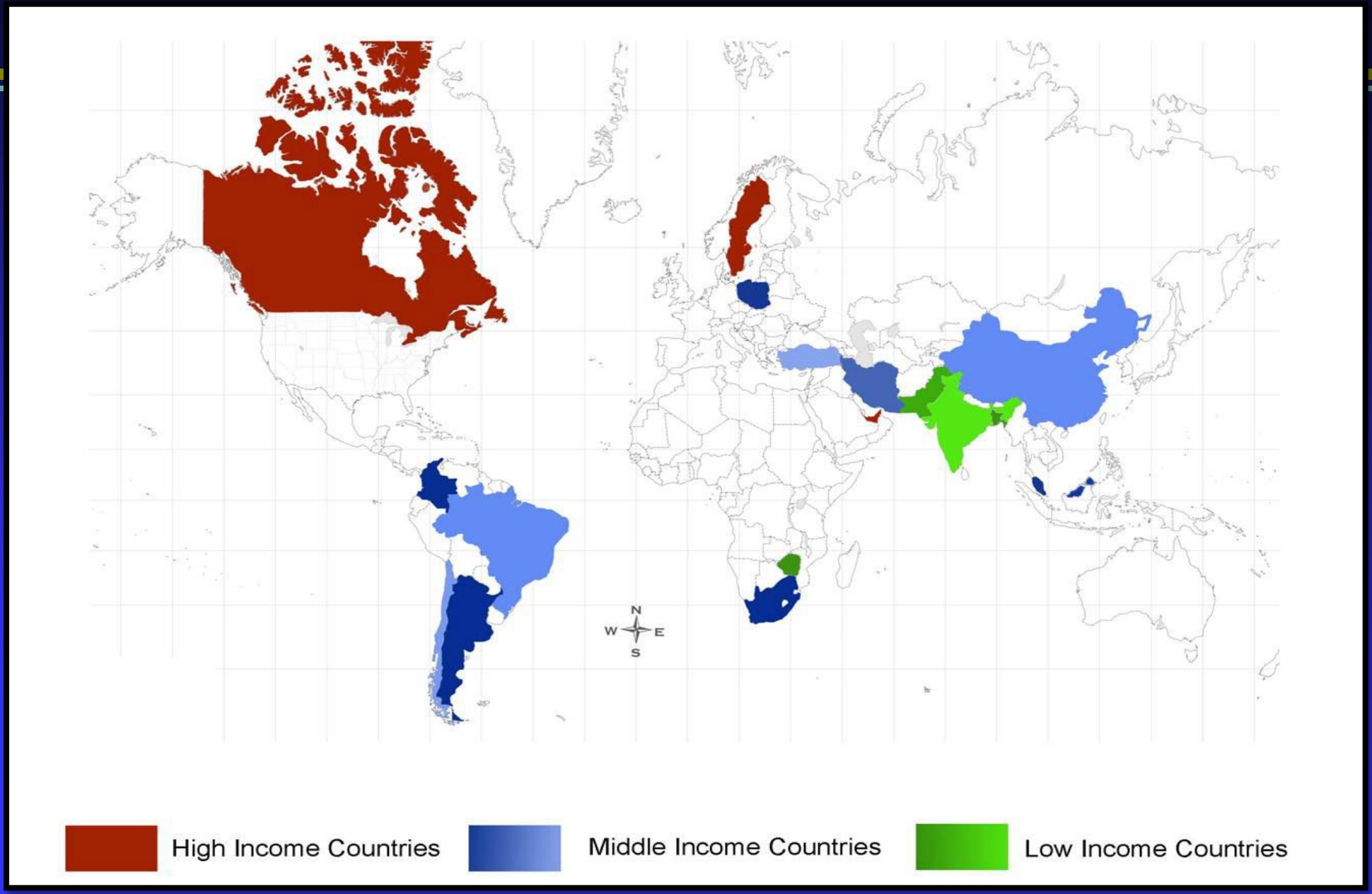
Aims

- To document the rates of use of proven secondary prevention medications in the ***community*** in high, mid and low income countries.
- To describe the variations in drug use by societal (economic level of countries and urban vs rural) and individual (gender, age, SES, other conditions) factors.

Design of PURE

- Unbiased ***population sample*** from 628 urban and rural communities in 17 countries involving >390,000 people (154,000 are >35 to 70 yrs; surveyed in 2003-2010.
- Documentation of the characteristics of the community, the household and individual (lifestyles, conditions, and drug use).
- Long term follow-up ongoing.

Countries in PURE



Classification of countries

Based on World Bank classifications at the beginning of the study(2003 – 2007):

HIC: Canada,Sweden & UAE.

- **UMIC**: Argentina,Brasil,Chile,Poland,Turkey, S Africa,Malaysia.
- **LMIC**: Colombia,Iran,China .
- **LIC**: India,Bangladesh,Pakistan,Zimbabwe.

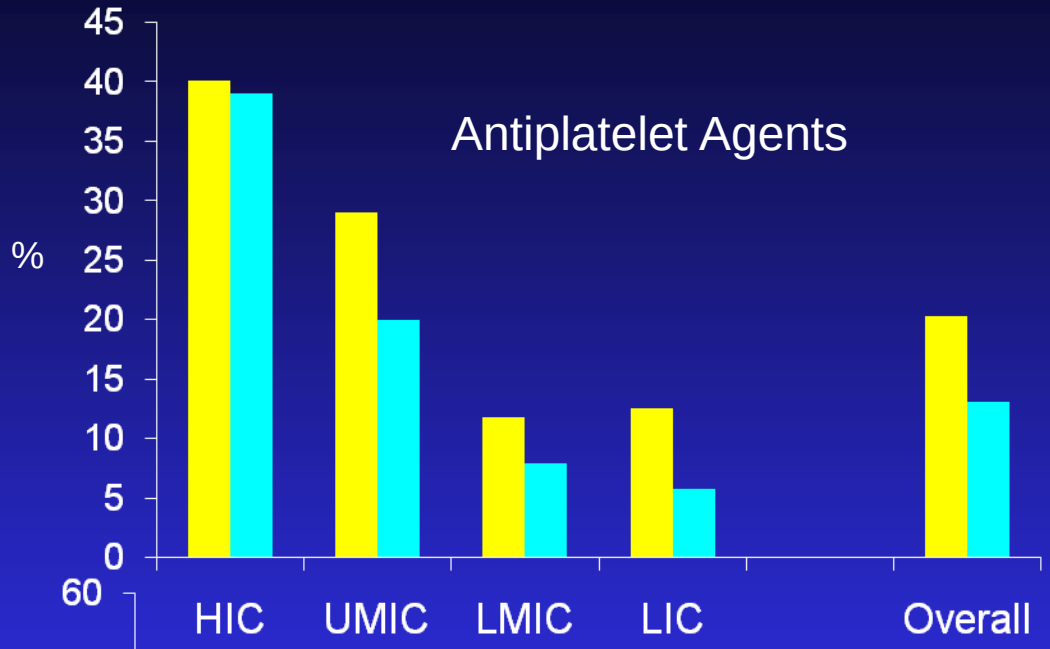
Key Characteristics of Eligible vs Enrolled

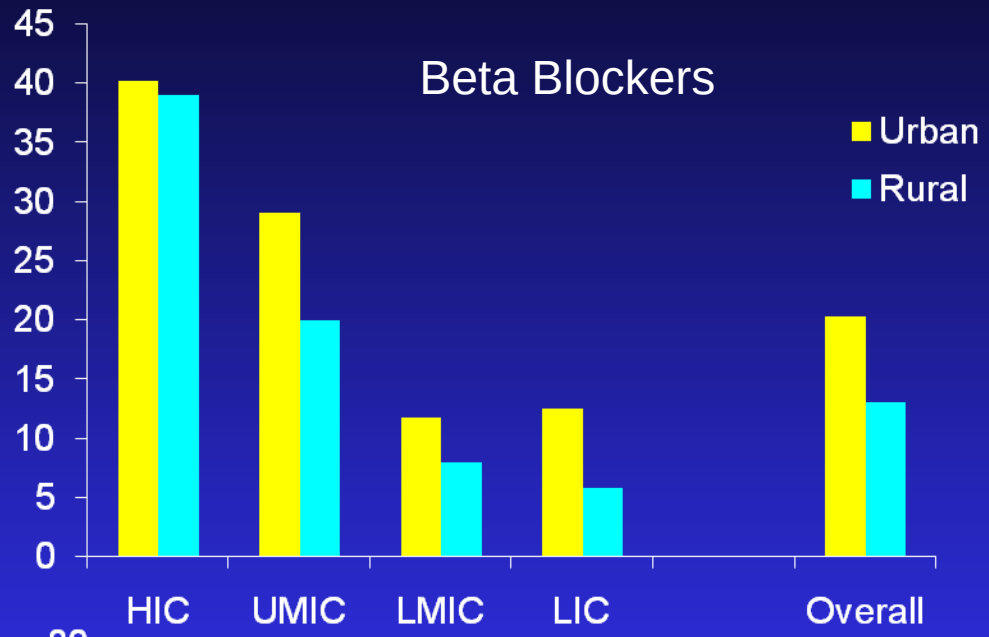
	Eligible	Enrolled
No.	197,332	153,662
Mean age (years)	50.2	50.7
% Females	53.0	55.6
% Current Smokers	22.1	21.2
% Low education	41.7	42.3
% H/O Hypertension	13.3	14.7
% H/O Diabetes	5.2	5.3
% H/O Stroke	1.2	1.3
% H/O CHD	3.5	3.9
% H/O Cancer	1.3	1.2

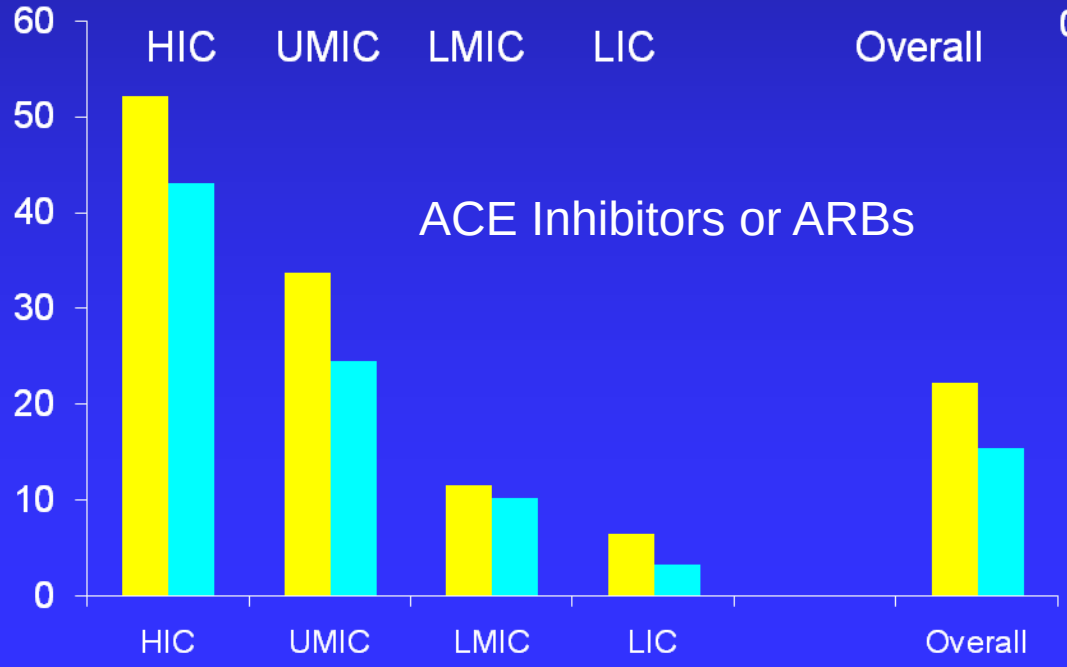
Use of Key Drugs in the Overall Study among those with CHD vs Stroke

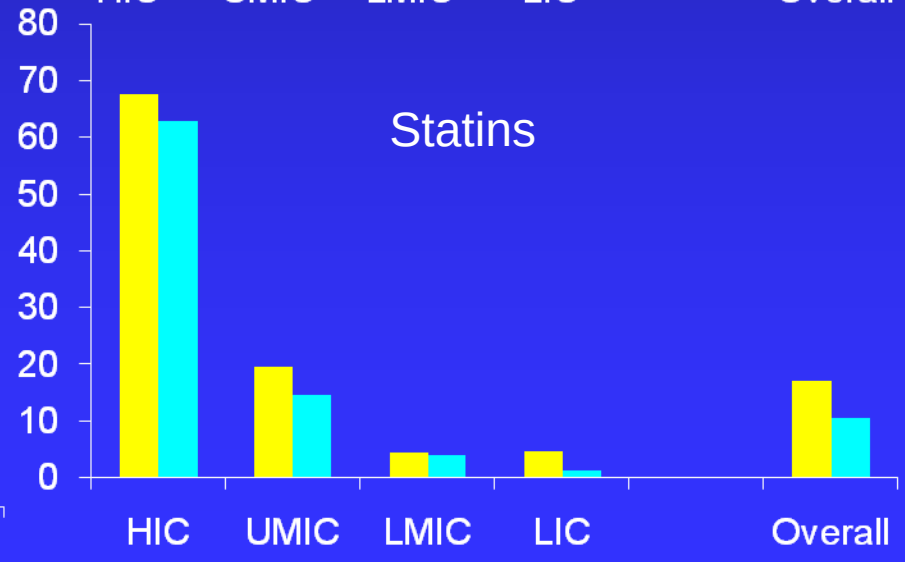
	CHD	Stroke
No.	5650	2292
	%	
Antiplatelets	25.8	24.3
Beta-blockers	20.4	9.4
ACE-I/ARB	20.0	18.6
Diuretics	13.6	15.2
CCB	13.3	14.4
BP lowering	43.0	40.0
Statins	16.7	9.0

Drugs

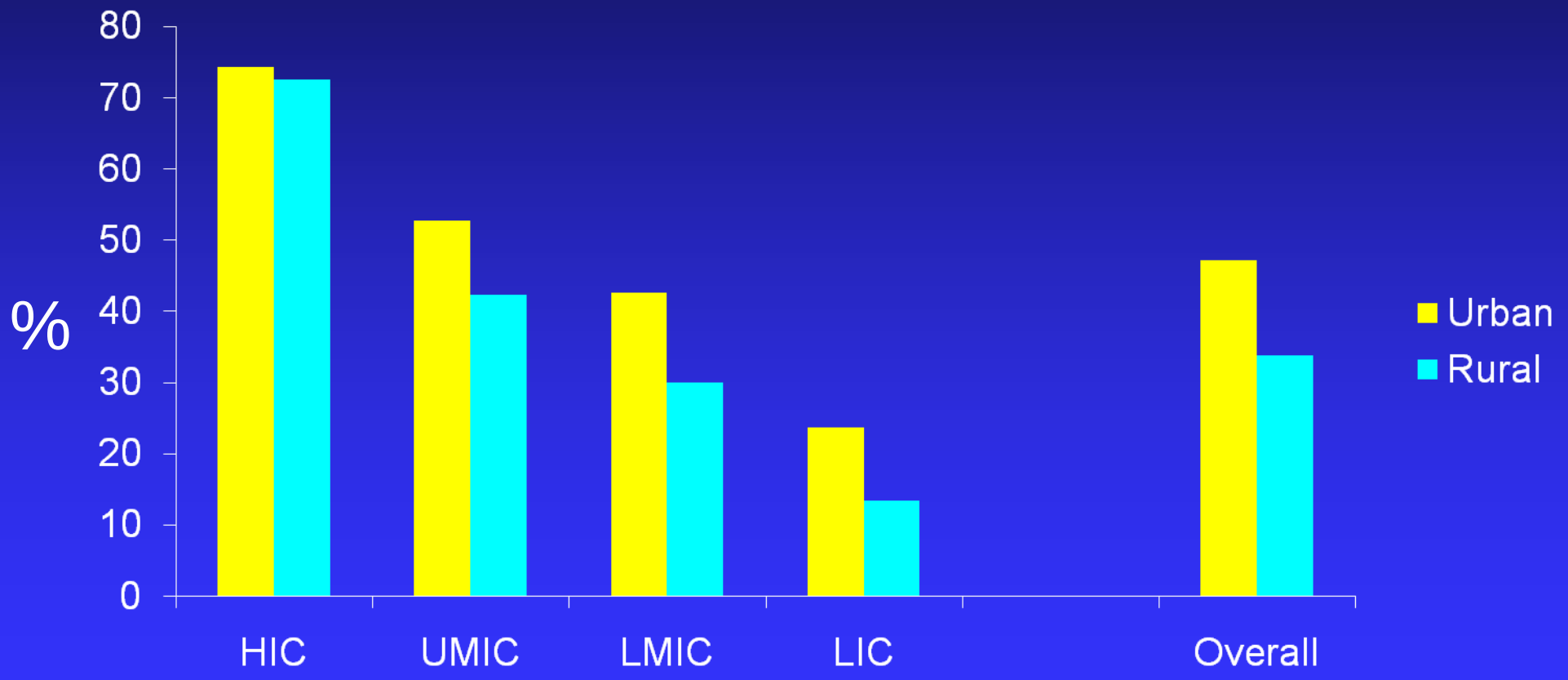

Antiplatelet Agents
%
45
40
35
30
25
20
15
10
5
0
HIC
UMIC
LMIC
LIC
Overall


Beta Blockers
Urban
Rural
45
40
35
30
25
20
15
10
5
0
HIC
UMIC
LMIC
LIC
Overall

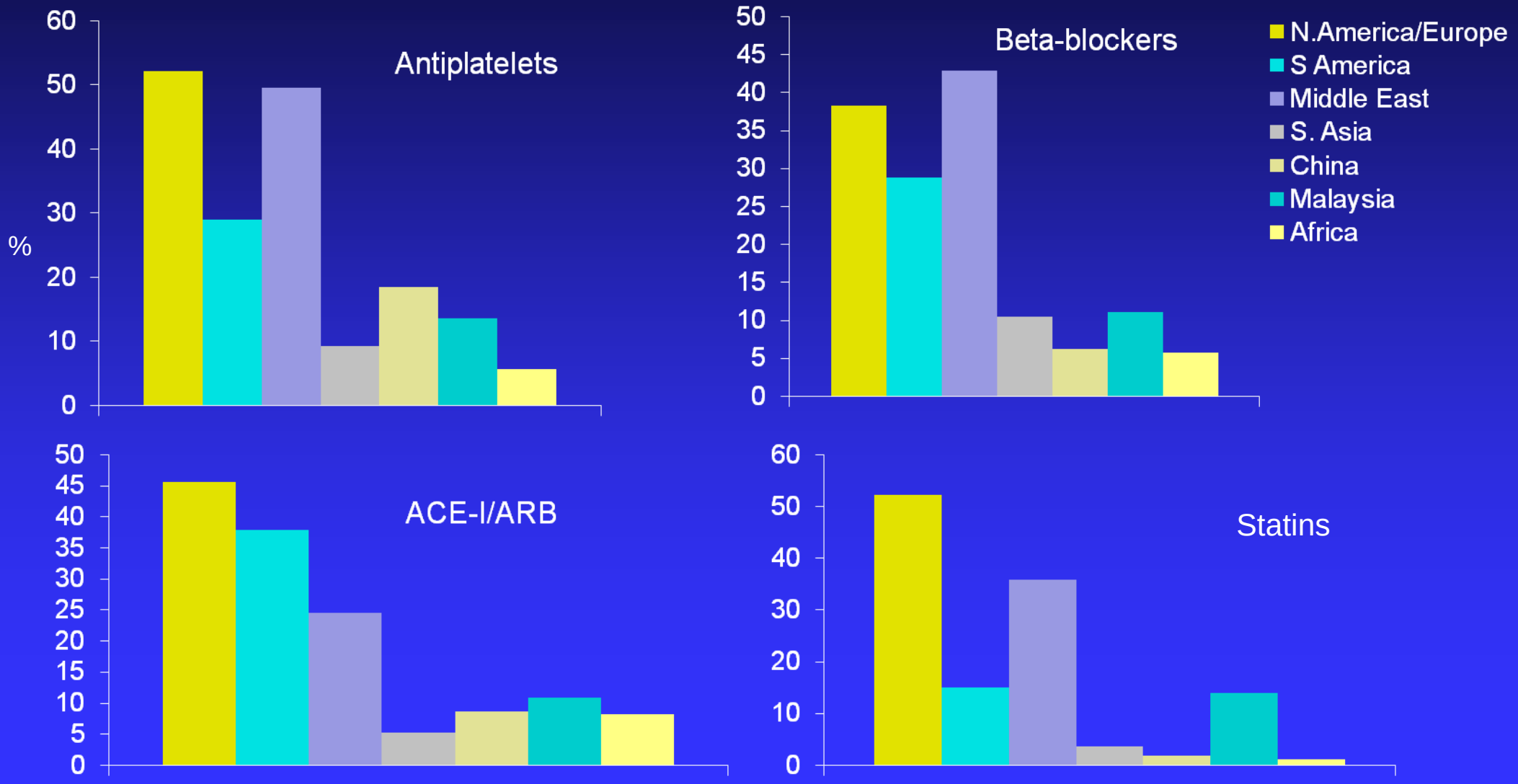

ACE Inhibitors or ARBs
60
50
40
30
20
10
0
HIC
UMIC
LMIC
LIC
Overall


Statins
80
70
60
50
40
30
20
10
0
HIC
UMIC
LMIC
LIC
Overall

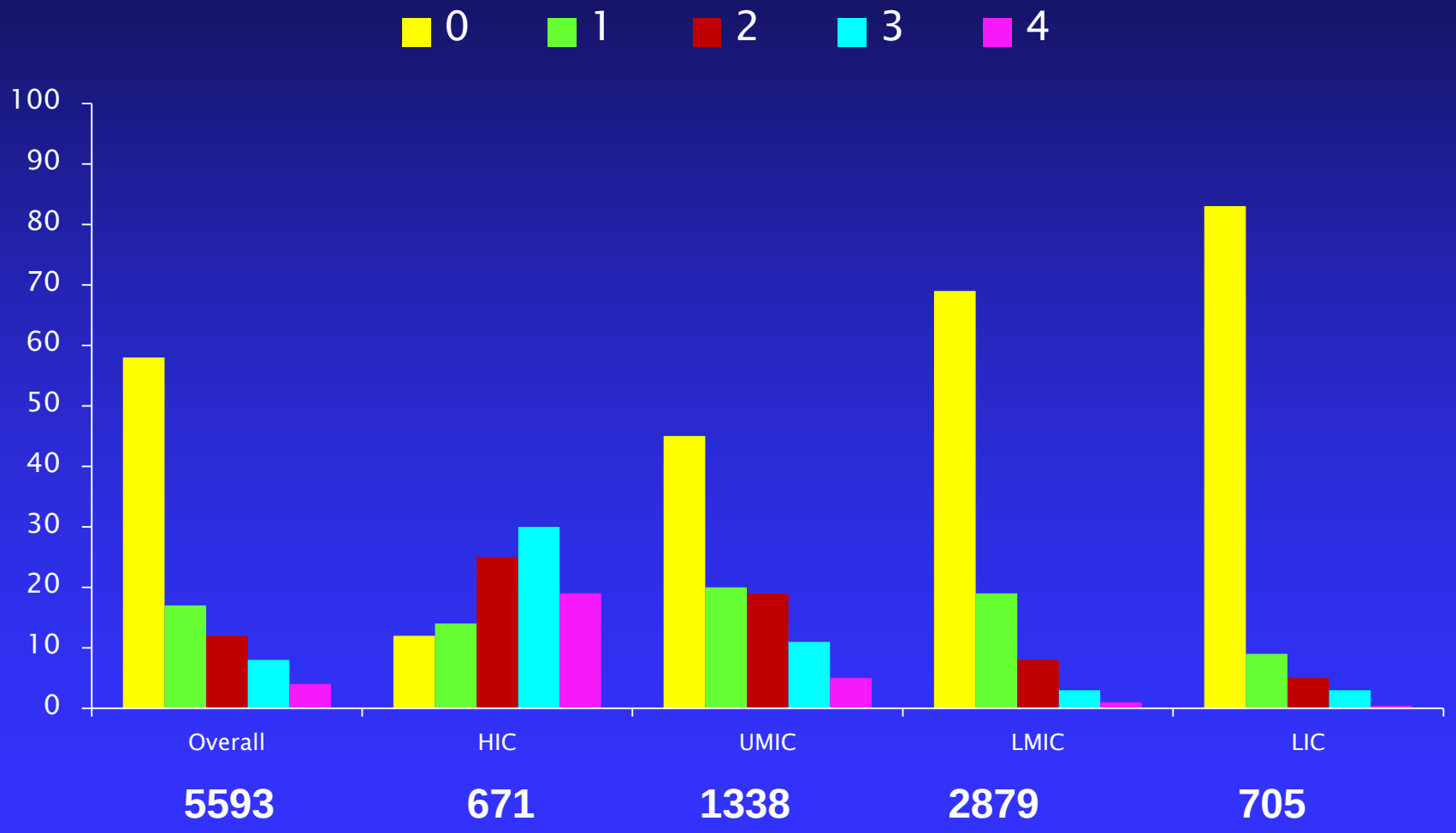
BP Lowering Drugs



Drugs by Regions

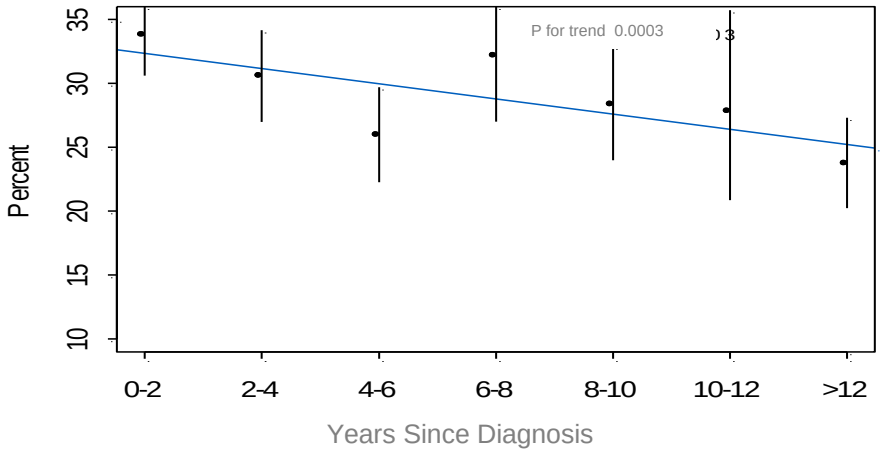


% receiving proven medications in CAD (154,000 people from 17 countries:PURE)

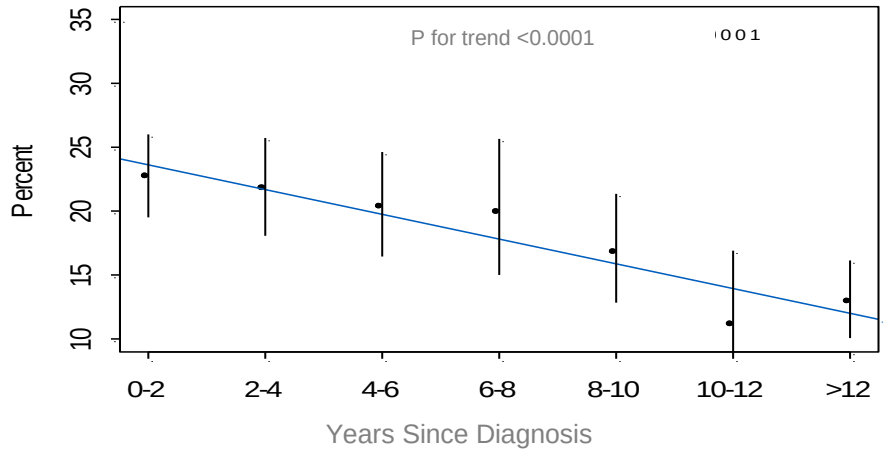


Medications by the Number of Years since Diagnosis

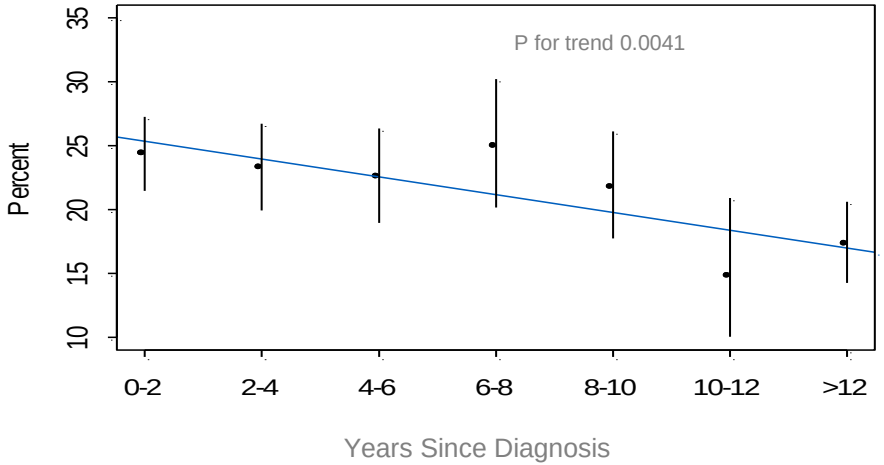
CHD: Antiplatelet



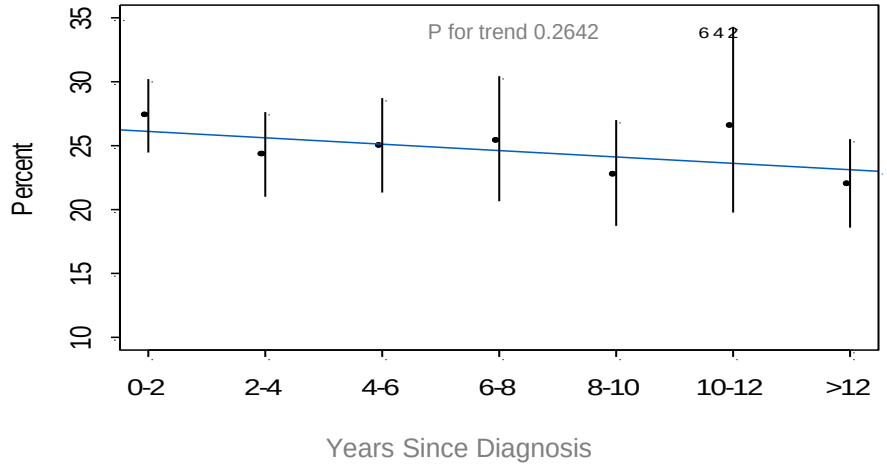
CHD: Statin



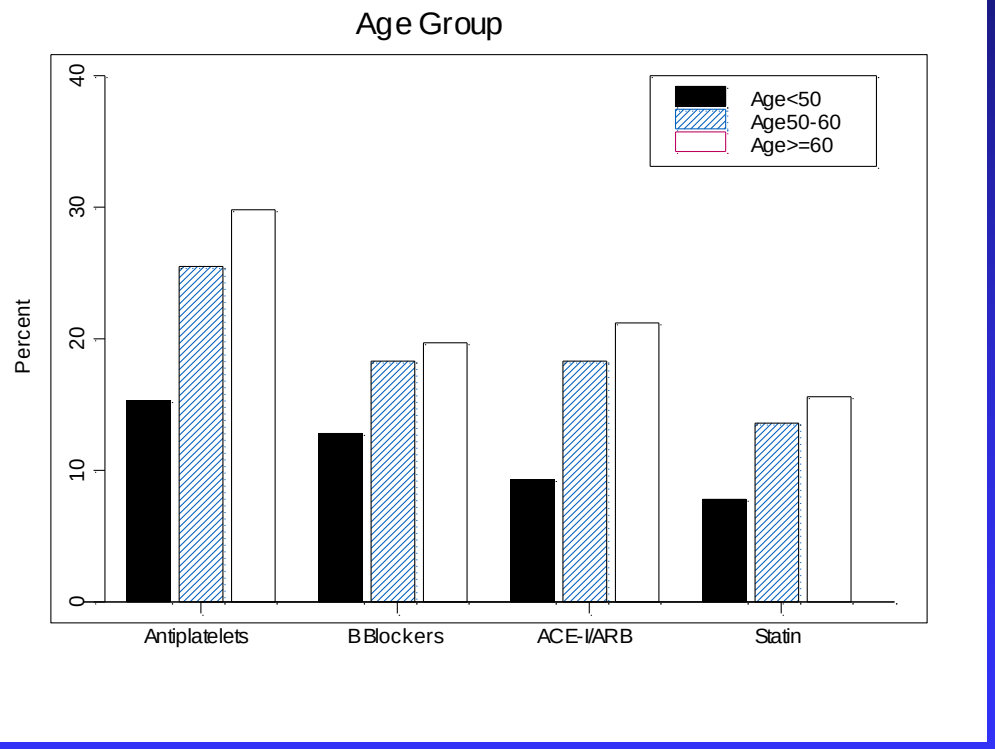
CHD: ACE-I/ARB

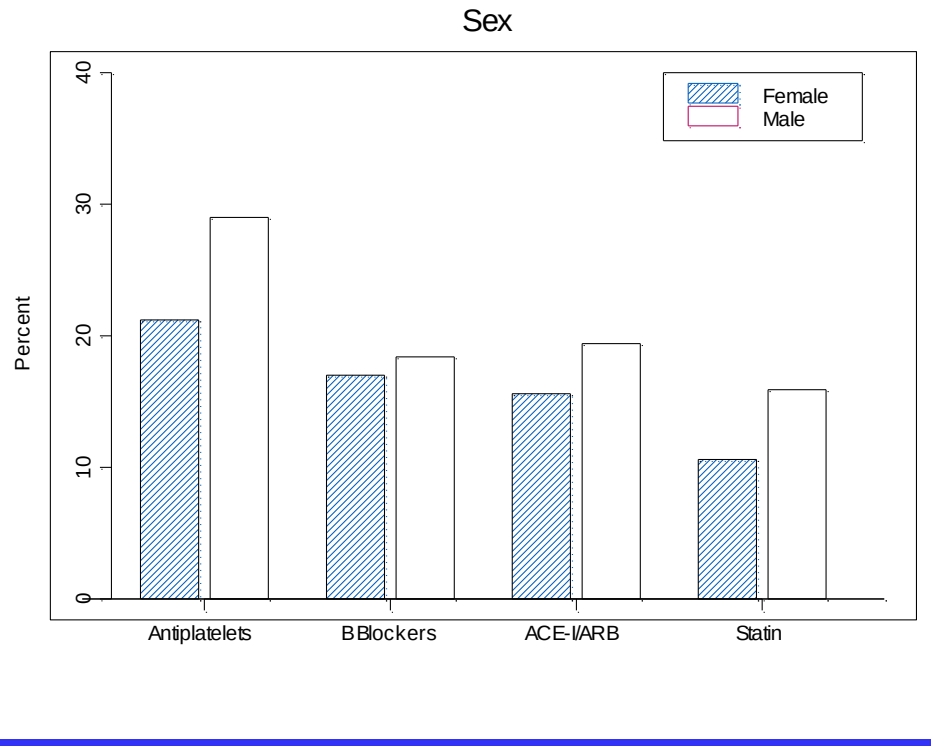


CHD: Beta Blocker



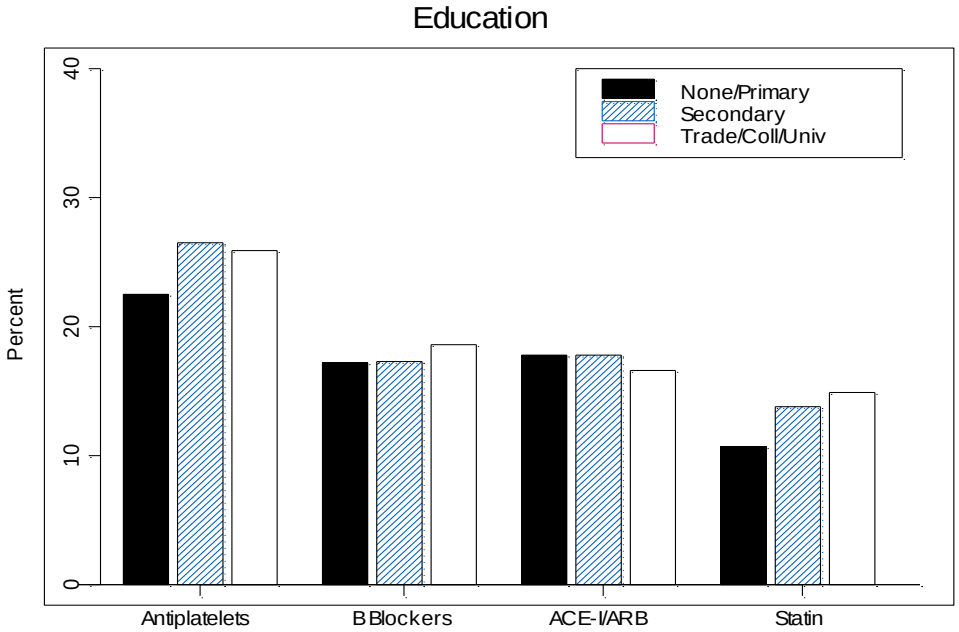
Medication in those with CHD or Stroke* Age and Sex

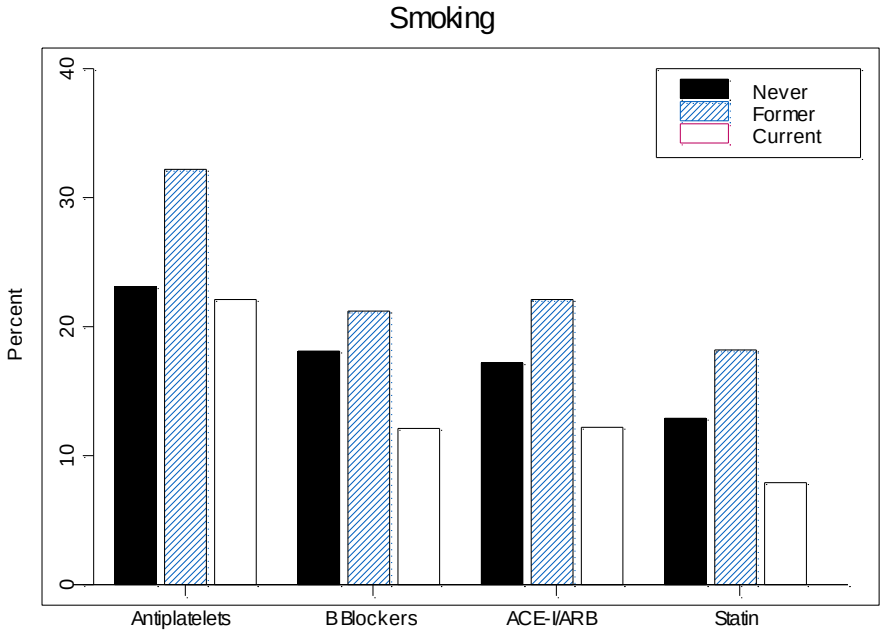




*Age, sex, mutual adjustment

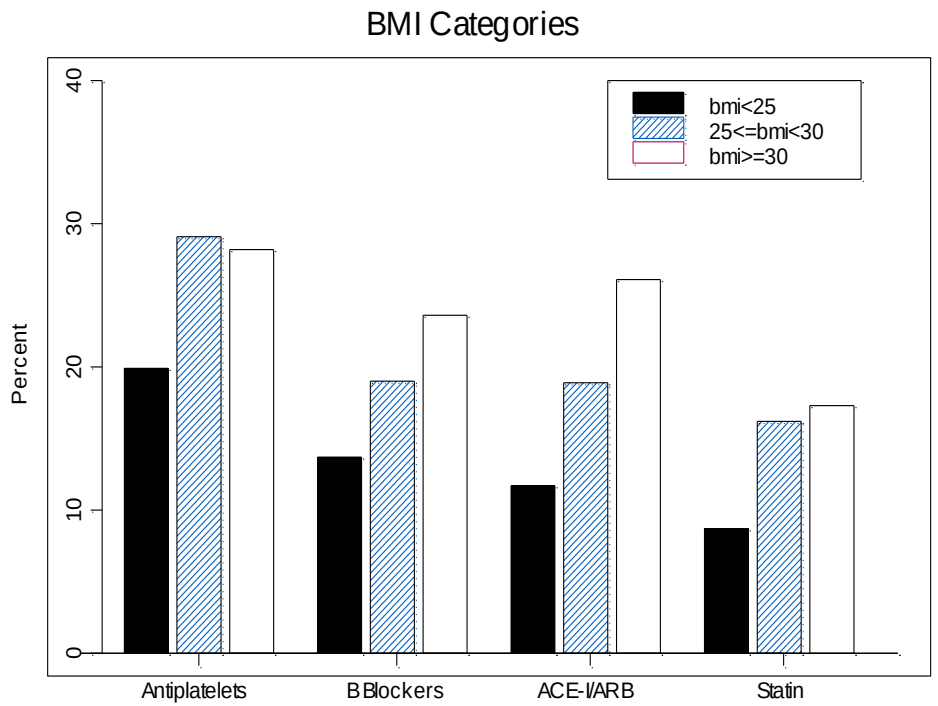
Medication in those with CHD or Stroke Education & Smoking*

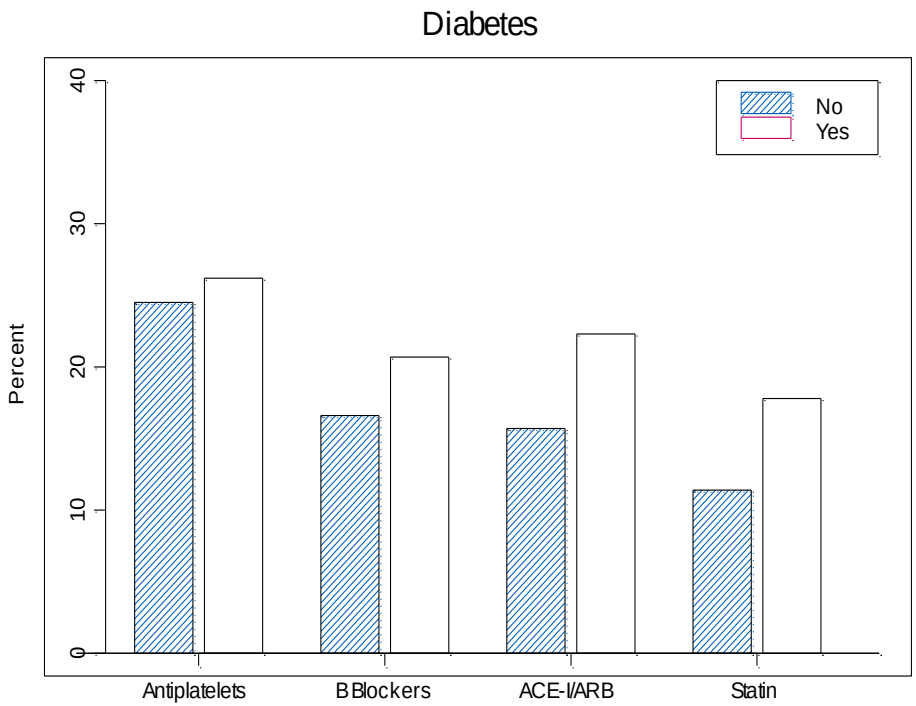




*Age, sex adjusted

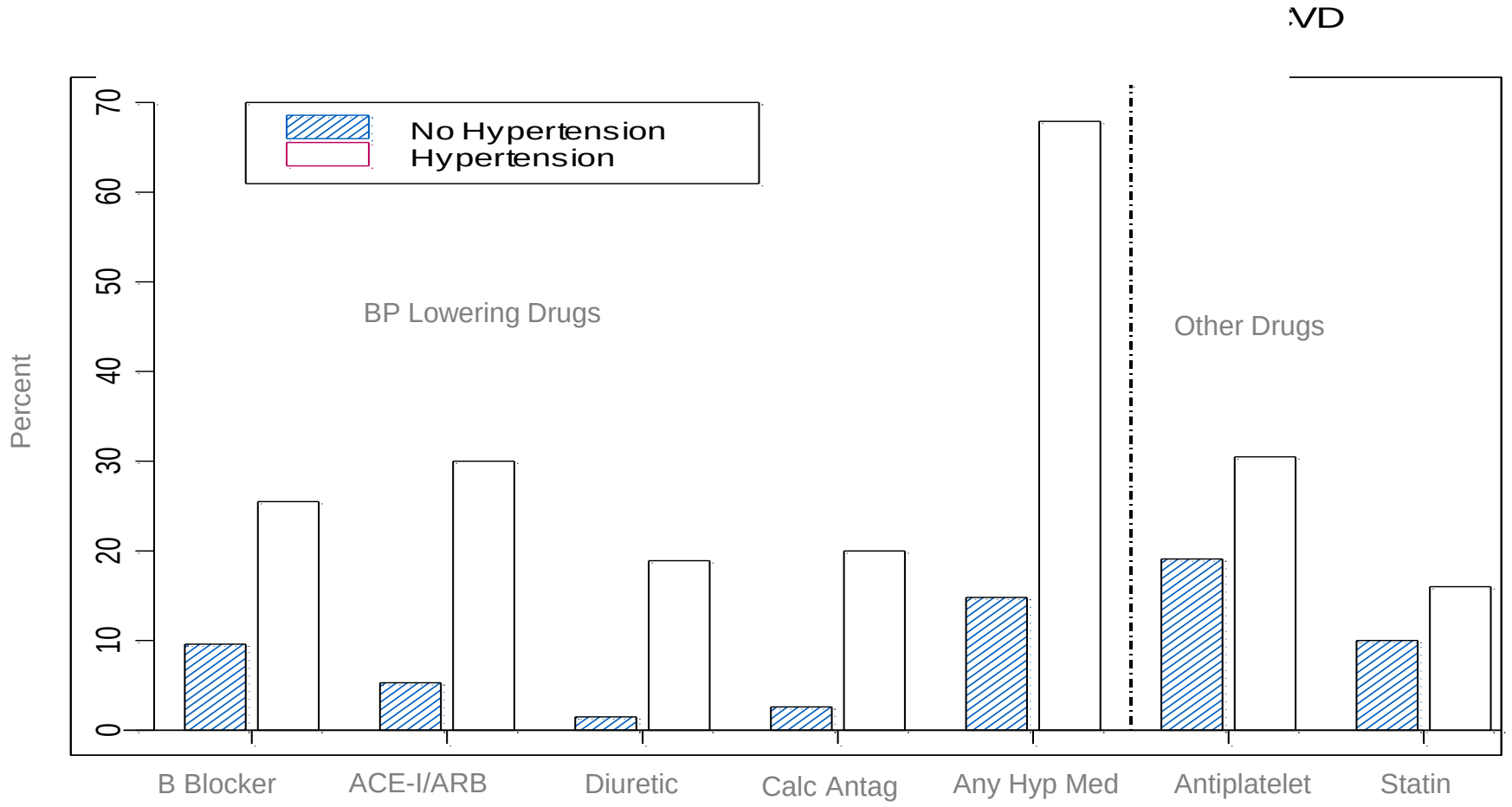
Medication in those with CHD or Stroke BMI and Diabetes*



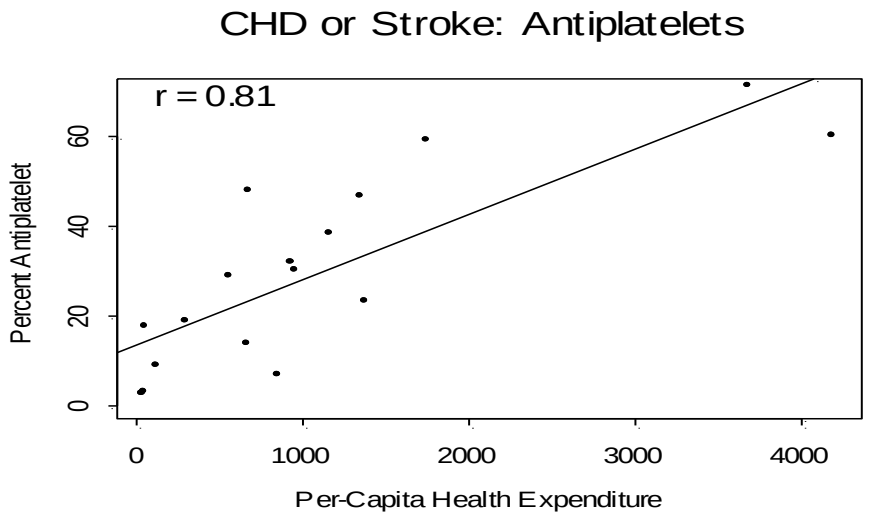


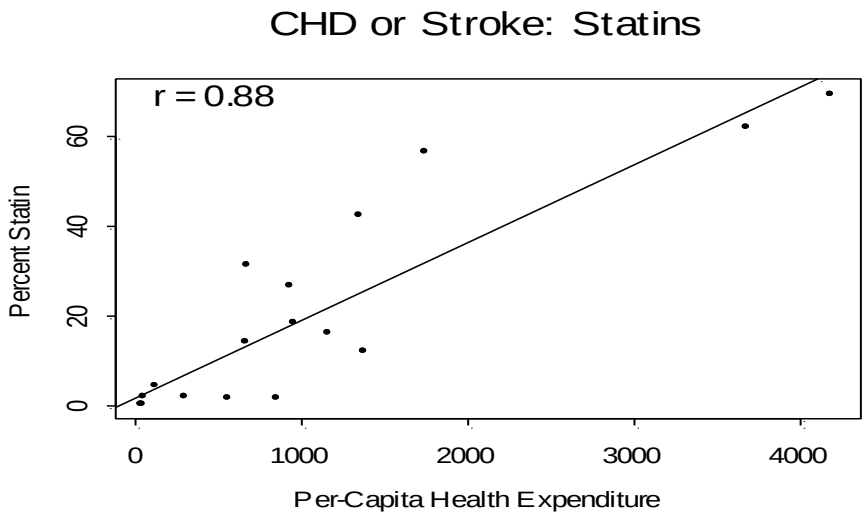
*Age, sex adjusted

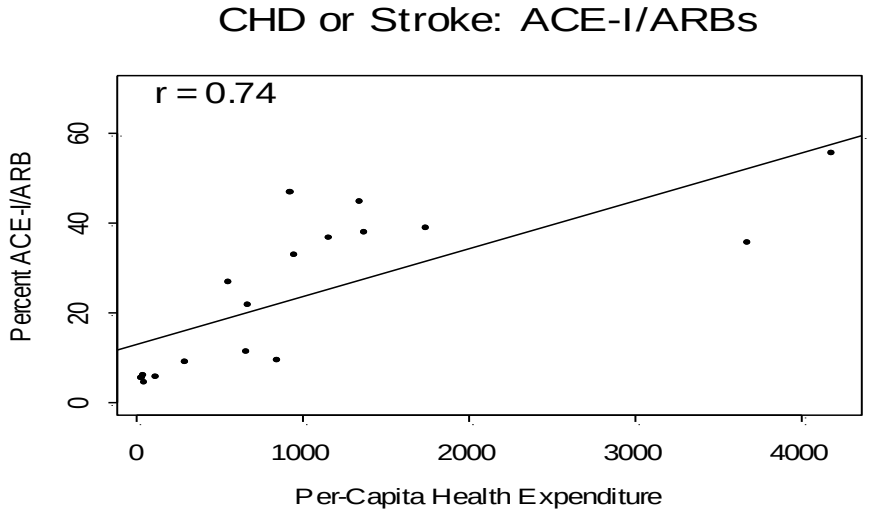
Drug Use by Hypertension in people with CVD

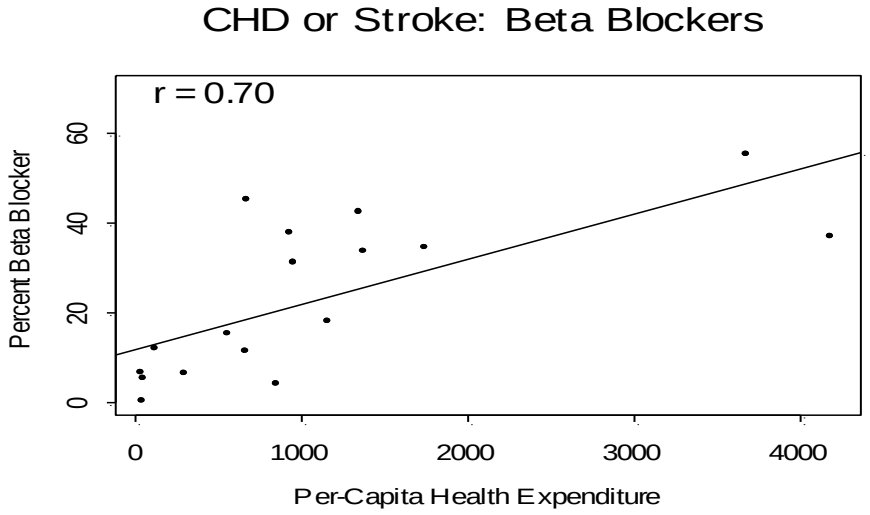


Per-Capita Health Expenditure vs Percentage the use of medications









Country (between country) & individual level (within country) variances

Medication	Between Country Variance (%)	Within Country Variance (%)
Antiplatelet	60.0	40.0
Beta-blocker	59.8	41.2
ACE-I/ARB	54.8	45.2
Statin	79.4	20.6
Any one of the above	68.4	31.6

Conclusions

- Substantial underutilization of proven, inexpensive secondary prevention medications in the community worldwide, but the gap is worse in MIC & LIC.
- Less use of medications in rural compared to urban communities, especially in LIC and MIC, in young, females, less educated, smokers, non-obese,& non-DM individuals.

Conclusions

- Marked differences in use of BB, ACE-I/ARB, diuretics & CCB in those with hypertension + CVD vs those without hypertension & CVD: *Do physicians treat risk factors rather than risk?*
- Inter-country variability twice as large as between subject variability: *national policies & structured health systems are more important.*

The large global gap in use of proven, inexpensive and safe strategies that could be readily dealt with that can benefit millions of individuals each year.

Lancet, August 28, 2011

Use of secondary prevention drugs for cardiovascular disease in the community in high-income, middle-income, and low-income countries (the PURE Study): a prospective epidemiological survey

Salim Yusuf, Shofiqul Islam, Clara K Chow, Sumathy Rangarajan, Gilles Dagenais, Rafael Diaz, Rajeev Gupta, Roya Kelishadi, Romaina Iqbal, Alvaro Avezum, Annamarie Kruger, Raman Kutty, Fernando Lanas, Liu Lisheng, Li Wei, Patricio Lopez-Jaramillo, Aytekin Oguz, Omar Rahman, Hany Swidan, Khalid Yusoff, Witold Zatonski, Annika Rosengren, Koon K Teo, on behalf of the Prospective Urban Rural Epidemiology (PURE) Study Investigators