HEARTS IN THE AMERICAS

Regional Workshop

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Sociedad Interamericana de Cardiología
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Regional Workshop

HYPERTENSION CONTROL AND SECONDARY PREVENTION IN LAC

Patricio Lopez-Jaramillo

FOSCAL and UDES

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Guidelines Debate

Hypertension Guidelines: Is It Time to Reappraise Blood Pressure Thresholds and Targets?

Position Statement of the Latin American Society of Hypertension

Patricio López-Jaramillo, Antonio Coca, Ramiro Sánchez, Alberto Zanchetti;
on behalf of the Latin American Society of Hypertension

(Hypertension. 2016;68:00-00.
DOI: 10.1161/HYPERTENSIONAHA.116.07738.)

TABLE 1. Blood pressure classification

Classification	SBP (mmHg)	DBP (mmHg)
Normotension		
Optimal BP	<120	<80
Normal BP	120–129	80–84
High-normal BP	130–139	85–89
Hypertension		
Grade 1	140–159	90–99
Grade 2	160–179	100–109
Grade 3	≥180	≥110
Isolated systolic hypertension	≥140	<90

When SBP and DBP values are in different BP categories, the individual should be classified in the higher BP category. BP, blood pressure.

Research

Original Investigation

Prevalence, Awareness, Treatment, and Control of Hypertension in Rural and Urban Communities in High-, Middle-, and Low-Income Countries

Clara K. Chow, PhD; Koon K. Teo, PhD; Sumathy Rangarajan, MSc; Shofiqul Islam, MSc; Rajeev Gupta, PhD; Alvaro Avezum, MD; Ahmad Bahonar, MPH; Jephat Chifamba, PhD; Gilles Dagenais, MD; Rafael Diaz, MD; Khawar Kazmi, MD; Fernando Lanas, MD; Li Wei, PhD; Patricio Lopez-Jaramillo, MD, PhD; Lu Fanghong, MD; Noor Hassim Ismail, MSc; Thandi Puoane, Dr PH; Annika Rosengren, MD; Andrzej Szuba, MD; Ahmet Temizhan, MD; Andy Wielgosz, MD; Rita Yusuf, PhD; Afzalhussein Yusufali, MD; Martin McKee, DSc; Lisheng Liu, MD; Prem Mony, MD; Salim Yusuf, DPhil; for the PURE (Prospective Urban Rural Epidemiology) Study investigators

JAMA 2013; 310 (9): 959-968

PREVALENCE OF AWARENESS, TREATMENT AND CONTROL AMONG THE HYPERTENSIVE POPULATION

Variables	Overall	Aware	Treated	Controlled	Proportion with BP<140/90 among those on treatment
	N	N (%)	N (%)	N (%)	N (%)
I Hypertension defined as self-reported hypertension on treatment OR blood pressure ≥140/90)					
HIC	6263	3070(49.0)	2924(46.7)	1189(19.0)	1189(40.7)
UMIC	18123	9516(52.5)	8761(48.3)	2833(15.6)	2833(32.3)
LMIC	23269	10134(43.6)	8595(36.9)	2314(9.9)	2314(26.9)
LIC	10185	4157(40.8)	3230(31.7)	1298(12.7)	1298(40.2)
Female	32649	16440(50.4)	14491(44.4)	4891(15.0)	4891(33.8)
Male	25191	10437(41.4)	9019(35.8)	2743(10.9)	2743(30.4)
South Asia	9751	3942(40.4)	3113(31.9)	1264(13.0)	1264(40.6)
China	18915	7866(41.6)	6503(34.4)	1545(8.2)	1545(23.8)
Malaysia	5321	2568(48.3)	2226(41.8)	680(12.8)	680(30.5)
Africa	2160	743(34.4)	677(31.3)	140(6.5)	140(20.7)
N. America/ EU	8682	4428(51.0)	4158(47.9)	1599(18.4)	1599(38.5)
Middle East	2074	1088(52.5)	1054(50.8)	354(17.1)	354(33.6)
S. America	**10937**	**6242(57.1)**	**5779(52.8)**	**2052(18.8)**	**2052(35.5)**
All Countries	**57840**	**26877(46.5)**	**23510(40.6)**	**7634(13.2)**	**7634(32.5)**

Among the 23 510 participants who self reported receiving treatment for hypertension, 7273 reported 2 or more types of blood pressure-lowering medications on their medication lists (30.8%[95%CI, 30.2%-31.4%] or 12.5%of all with hypertension [95%CI, 12.2%-12.8%]).

The use of 2 or more medications was significantly lower in LICs compared with HICs, UMICs, or LMICs (combined P = <.001; in HICs, 18.1%[95%CI,17.2%-19.1%]; in UMICs, 14.5%[95%CI, 14.0%-15.1%]; in LMICs,14.1% [95% CI, 13.7%-14.6%]; and in LICs, only 1.6% [95% CI,1.4%-1.8%];

Hypertension treatment

Who should receive hypertension treatment?

Hypertension treatment is indicated for adults diagnosed with hypertension, as defined above (SBP ≥140 mmHg and/or DBP ≥90 mmHg). Patients with SBP ≥160 mmHg or DBP ≥100 mmHg may be indicated for immediate treatment based on one assessment.

What medications should be used to treat hypertension?

There are four main classes of antihypertensive medications: angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARB), calcium channel blockers (CCB), and thiazide and thiazide-like diuretics. Any of these four classes of antihypertensive medication may be used unless there are specific contraindications. Proper treatment of hypertension usually requires a combination of hypertension medications.

Treatment targets

For most patients, blood pressure is considered controlled when SBP <140 mmHg and DBP <90 mmHg. However, for patients with diabetes or a high risk of CVD, certain guidelines recommend lower targets: SBP <130 mmHg and DBP <80 mmHg.

Consensus Document

Best antihypertensive strategies to improve blood pressure control in Latin America: position of the Latin American Society of Hypertension

Antonio Coca[a], Patricio López-Jaramillo[b,c], Costas Thomopoulos[d], and Alberto Zanchetti[e], on behalf of the Latin American Society of Hypertension (LASH)

Journal of Hypertension 2018;36(2):208-220.

The use of a standardized algorithm is critical to success because it:

- enables task-sharing, with the entire health care team able to support patients
- increases ease of logistics in terms of drug inventory, drug forecasting, and quality monitoring
- enables large reductions in cost of medication
- enables evaluation of impact
- simplifies implementation of changes to protocols, if needed.

TABLE 2. Latin American Society of Hypertension recommendations based on the best available evidence

Medication class	Primary	Backup
Diuretic	Chlortalidone	Hydrochlorothiazide
ACE inhibitor[a]	Ramipril, Llisinopril, Perindopril, Fosinopril, Benazapril	Lisinopril, Ramipril, Perindopril, Fosinopril, Benazapril
ARB[a]	Valsartan, Irbesartan, Candesartan, Olmesartan, Telmisartan	Irbesartan, Valsartan, Candesartan, Olmesartan Telmisartan
CCB	Amlodipine, Nifedipine-Gits, Felodipine-Er, Lacidipine, Lercanidipine, Manidipine	Diltiazem-sr, Verapamil-sr
Beta-blocker[b]	Bisoprolol, Atenolol, Metoprolol LA	Nebivolol
Other	Spironolactone	Eplerenone

There is no robust evidence supporting that one or two compounds are superior to others within the same class of antihypertensive drugs in reducing CV events, CV mortality and allcause mortality. The duration of the antihypertensive effect over 24h taking the compound once-daily may be an associated requirement to improve compliance to treatment. Also specific pharmacological properties may be considered in some group classes such as CA and BB. ACE-I, angiotensin-converting-enzyme inhibitor; ARB, AT1 blocker; BB, beta-blocker;

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Check for updates

WILEY

COMMENTARY

Fixed-dose combination pharmacologic therapy to improve hypertension control worldwide: Clinical perspective and policy implications

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J Clin Hypertens. 2019;21:4–15

6

HYPERTENSION PROTOCOL
ACE-I or ARB* + diuretic as first-line treatment

step 1 SCREEN ALL ADULTS

step 2 If BP ≥140 or ≥90 **
PRESCRIBE starting dose of ACE-I or ARB
with thiazide-like diuretic ***

After one month

step 3 IF still ≥140 or ≥90
INCREASE to full dose of ACE-I or ARB
with thiazide-like diuretic†

After one month

step 5 IF still ≥140 or ≥90
ADD starting dose of CCB

After one month

step 6 IF still ≥140 or ≥90
INCREASE to full dose of CCB

After one month

step 7 IF still ≥140 or ≥90
CHECK that patient has been taking drugs regularly and correctly – IF this is the case, REFER patient to a specialist

DRUGS AND DOSES ‡

Class	Medication	Starting dose	Intensification dose
ACE inhibitor § (angiotensin-converting-enzyme inhibitor)	lisinopril	20 mg	40 mg
	ramipril	5 mg	10 mg
	perindopril	4–5 mg	8–10 mg
ARB §	losartan	50 mg	100 mg
	telmisartan	40 mg	80 mg
diuretic § thiazide-like	chlorthalidone ‖ or indapamide SR ‖	12.5 mg	25 mg
		1.5 mg	stay at 1.5 mg
CCB (calcium channel blocker)	amlodipine	5 mg	10 mg

PROVISION FOR SPECIFIC PATIENTS

- **THIS PROTOCOL IS CONTRAINDICATED FOR WOMEN WHO ARE OR COULD BECOME PREGNANT.**
- Manage diabetes as indicated by national protocol.
- Aim for BP <130/80 for people at high risk, such as individuals with diabetes, CAD, stroke, or CKD.

LIFESTYLE MANAGEMENT ADVICE FOR ALL PATIENTS

- Stop all tobacco use, avoid secondhand tobacco smoke.
- Drink no more than two units of alcohol per day and do not drink on at least two days of the week.
- Increase physical activity to equivalent of brisk walk 150 minutes per week.
- If overweight, lose weight.
- Eat heart-healthy diet:
  - Eat a low-salt diet.
  - Eat ≥5 servings of vegetables/fruit per day.
  - Use healthy oils (e.g. olive, safflower).
  - Eat nuts, legumes, whole grains and foods rich in potassium.
  - Limit red meat to once or twice a week at most.
  - Eat fish or other food rich in omega 3 fatty acids (e.g., flax seeds) at least twice a week.
  - Avoid added sugar from cakes, cookies, sweets, fizzy drinks and juice.

4

HYPERTENSION PROTOCOL

ACE-I or ARB* + CCB as first-line treatment

step 1 SCREEN ALL ADULTS

step 2 If BP ≥140 or ≥90** PRESCRIBE starting dose of ACE-I or ARB*** + CCB[a]

After one month

step 3 IF still ≥140 or ≥90 INCREASE to full dose of ACE-I or ARB + CCB

After one month

step 4[†] IF still ≥140 or ≥90 ADD thiazide-like diuretic

After one month

step 5 IF still ≥140 or ≥90[†] CHECK that patient has been taking drugs regularly and correctly – IF this is the case, REFER patient to a specialist

DRUGS AND DOSES[b]

Class	Medication	Starting dose	Intensification dose
ACE inhibitor[5] (angiotensin-converting-enzyme inhibitor)	lisinopril	20 mg	40 mg
	ramipril	5 mg	10 mg
	perindopril	4–5 mg	8–10 mg
ARB[5]	losartan	50 mg	100 mg
	telmisartan	40 mg	80 mg
CCB (calcium channel blocker)	amlodipine	5 mg	10 mg
diuretic[5] thiazide-like	chlorthalidone[a] or indapamide SR[a]	12.5 mg	25 mg
		1.5 mg	stay at 1.5 mg

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  - Eat fish or other food rich in omega 3 fatty acids (e.g., flax seeds) at least twice a week.
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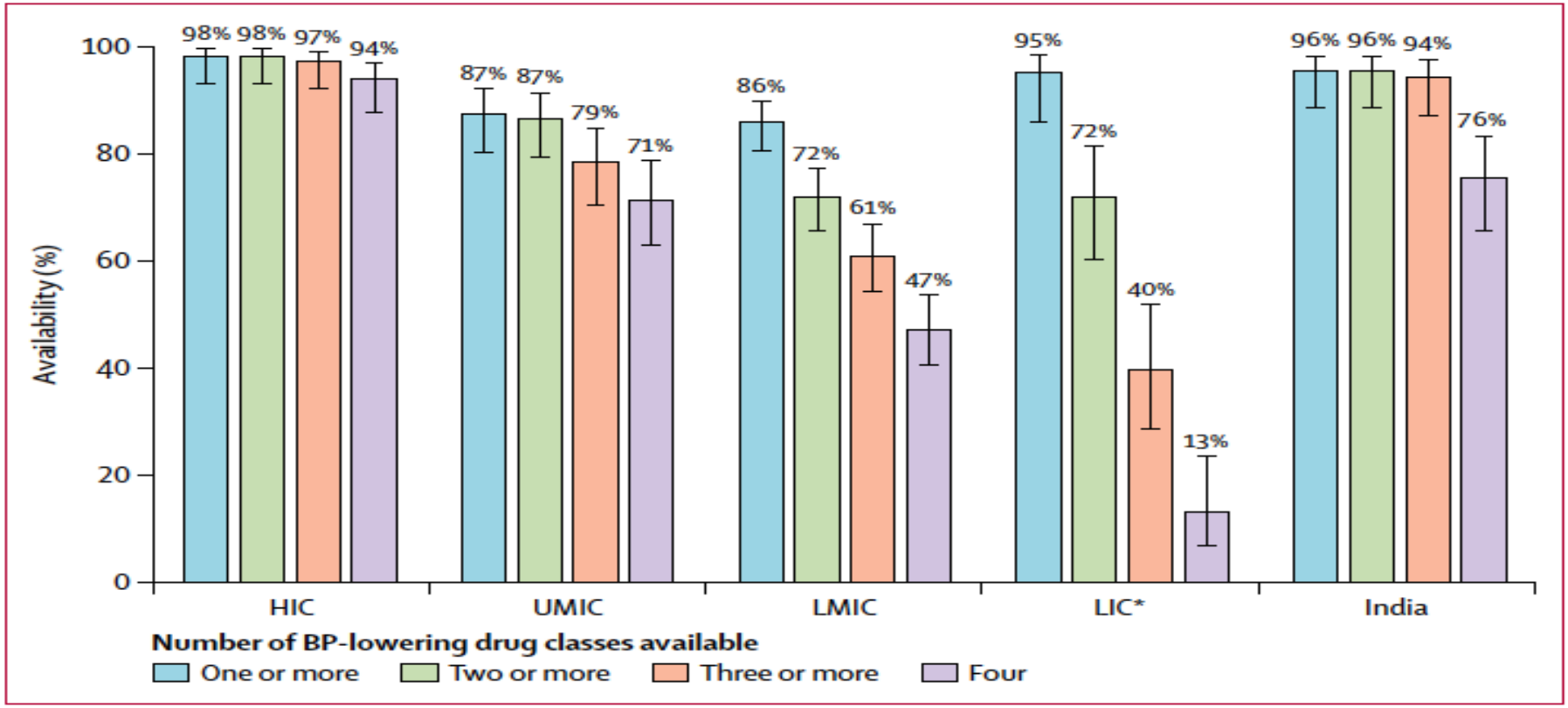

***Figure 1*: Availability of BP-lowering medicines in 626 PURE communities**
Error bars represent 95% CIs. BP=blood pressure. HIC=high-income countries. UMIC=upper-middle-income countries. LMIC=lower-middle-income countries. LIC=low-income countries. *Excluding India.

Attaei MW, et al. Lancet Public Health 2017; e411-419

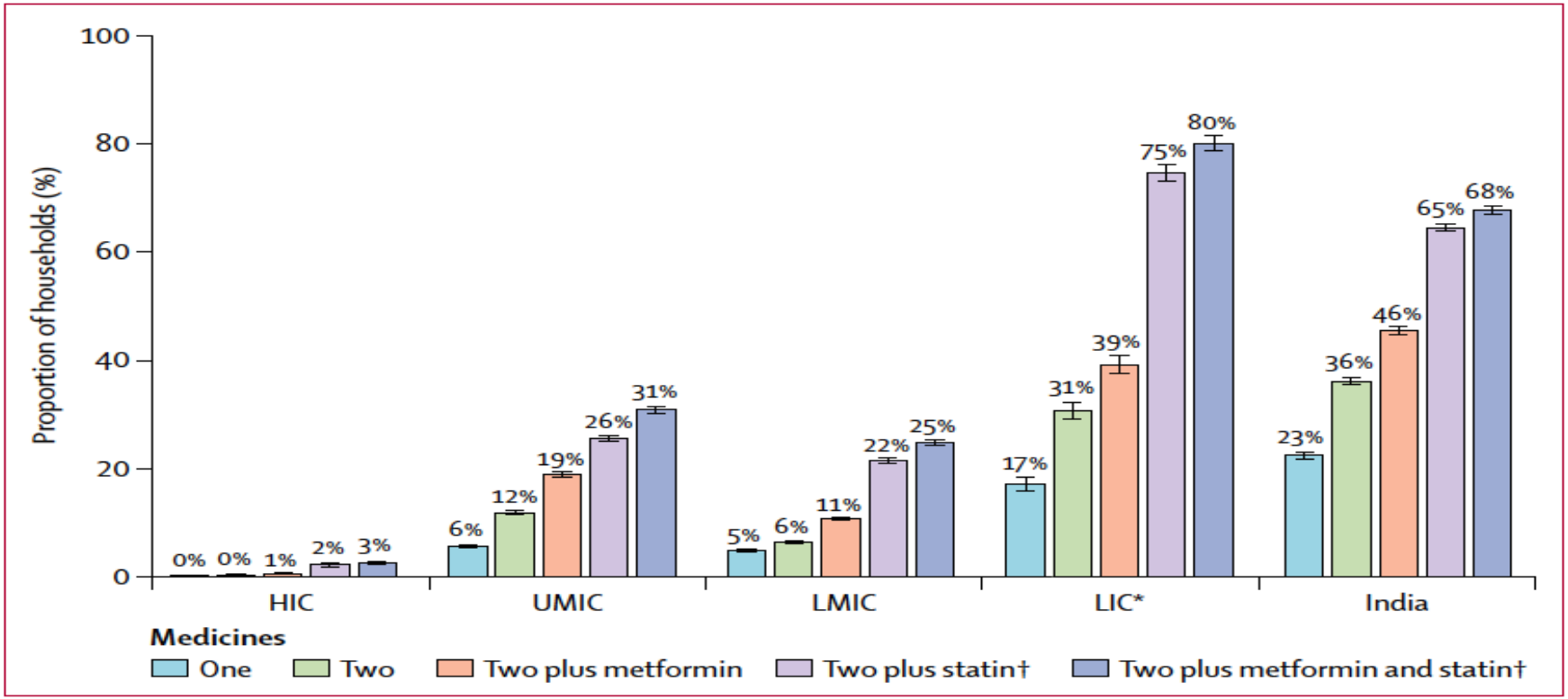

Figure 2: **Proportion of households that could not afford blood pressure-lowering medicines and combination therapy (n=98 785)**

With a 20% capacity-to-pay threshold. Error bars represent 95% CIs. HIC=high-income countries. UMIC=upper-middle-income countries. LMIC=lower-middle-income countries. LIC=low-income countries. *Excluding India and Zimbabwe. †Tanzania excluded because statins were unavailable.

Attaei MW, et al. Lancet Public Health 2017; e411-419

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

Summary

Background Although most cardiovascular disease occurs in low-income and middle-income countries, little is known about the use of effective secondary prevention medications in these communities. We aimed to assess use of proven effective secondary preventive drugs (antiplatelet drugs, β blockers, angiotensin-converting-enzyme [ACE] inhibitors or angiotensin-receptor blockers [ARBs], and statins) in individuals with a history of coronary heart disease or stroke.

Methods In the Prospective Urban Rural Epidemiological (PURE) study, we recruited individuals aged 35–70 years

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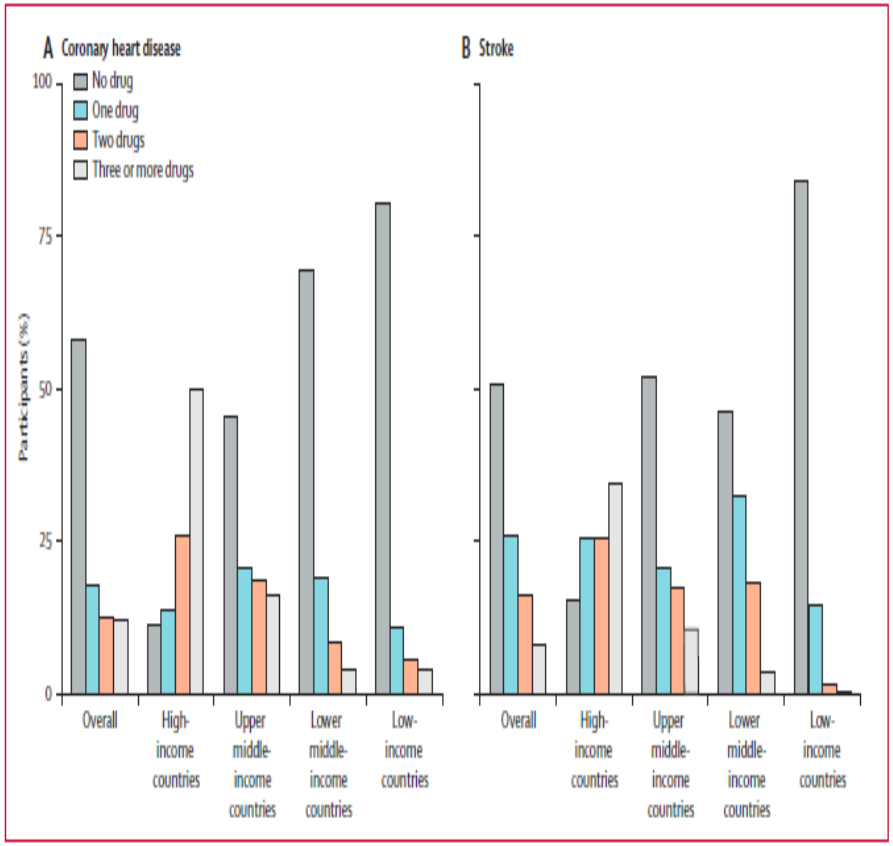
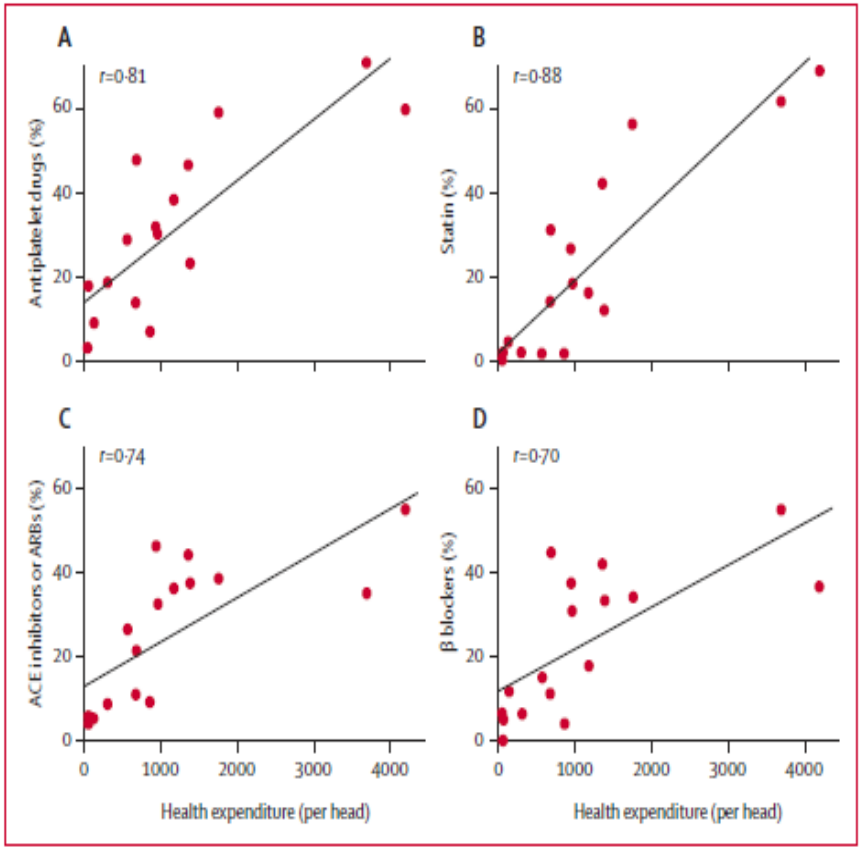
See Online/Comment DOI:10.1016/S0140-6736(11)61302-0

USE OF SECONDARY PREVENTION DRUGS FOR CARDIOVASCULAR DISEASE HEALTH EXPENDITURE PER HEAD VERSUS DRUG USE IN EVERY COUNTRY





Yusuf S,....Lopez-Jaramillo P.... Lancet. 2011 Oct 1;378(9798):1231-1243

ORIGINAL RESEARCH

gSCIENCE

Secondary CV Prevention in South America in a Community Setting

The PURE Study

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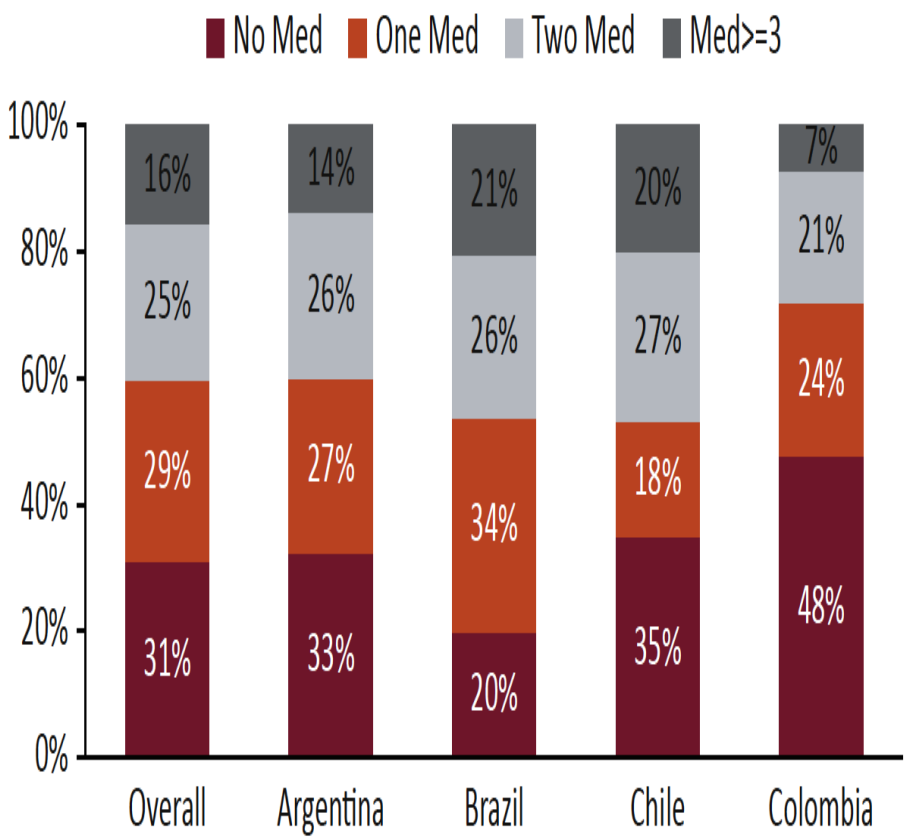
São Paulo, Brazil; Temuco, Chile; Bucaramanga, Colombia; Rosario, Argentina; Lima, Peru; and Hamilton, Ontario, Canada

The authors report no relationships that could be construed as a conflict of interest.

The main PURE study and its components are funded by the Population Health Research Institute, the Canadian Institutes of Health Research, and the Heart and Stroke Foundation of Ontario, and through un-

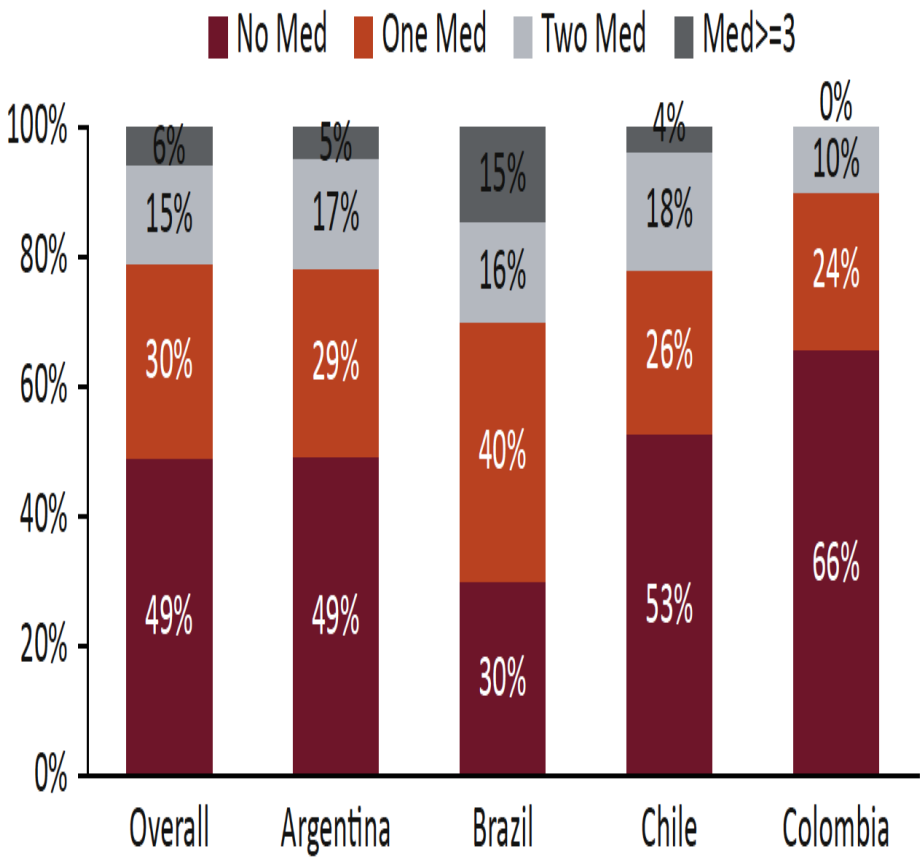
A

Proportion of medications in individuals with CHD by countries in South America



B

Proportion of medications in individuals with stroke by countries in South America



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