

Improving implementation of evidence into practice

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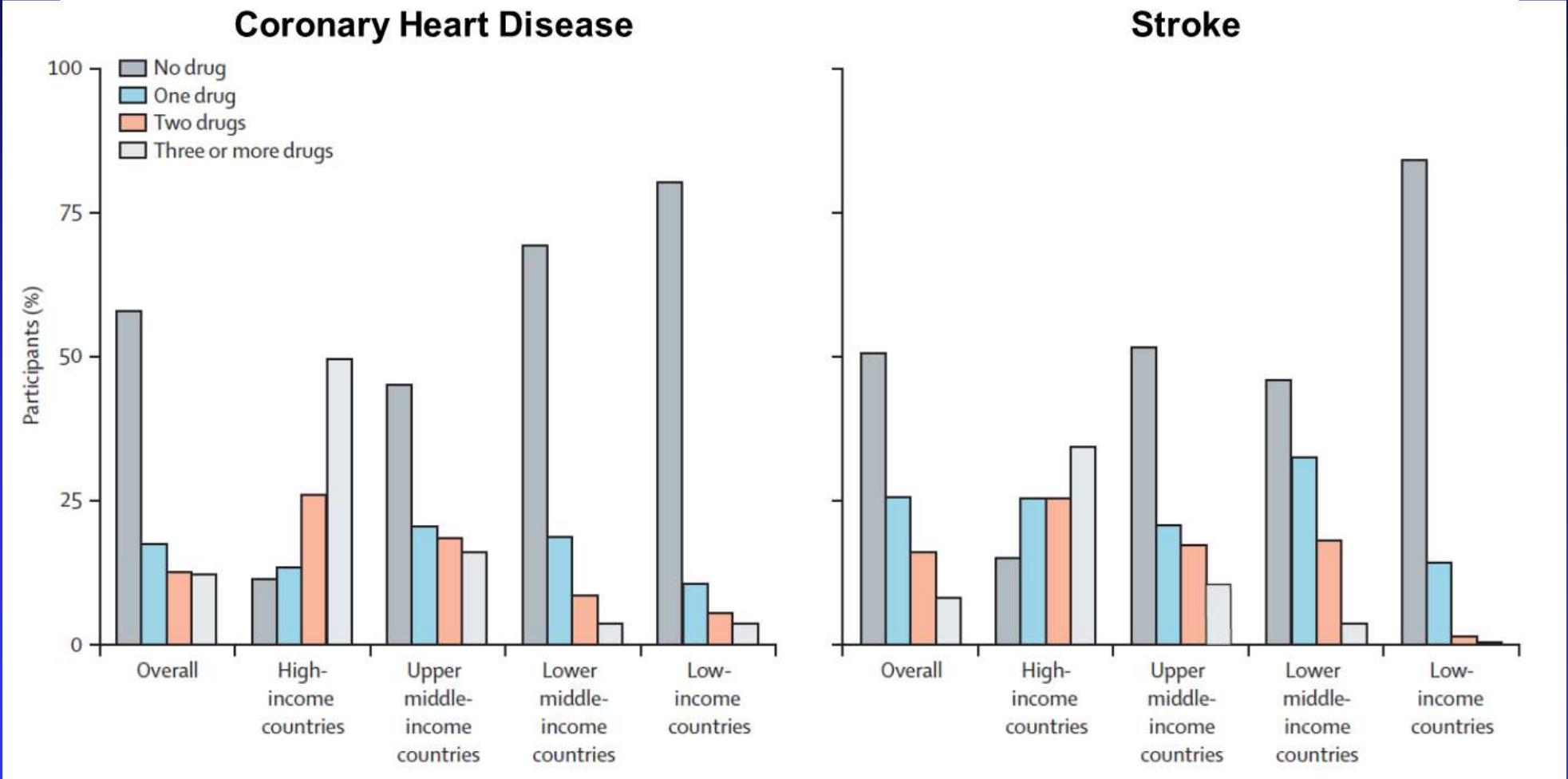
Hamilton, Canada

Evolution of evidence based practice in cardiology

- Pre 1975: Very few robust RCTs and few established treatments
- 1975 onwards: Robust, large practice changing trials in AMI (ISIS and GISSI) and other CVD conditions
- 2000 onwards: Development of practice guidelines.....modest impact
- 2014 WHF road maps and training mid career cardiovascular specialists and scientists (*Emerging Leaders program*) in best implementation practices.

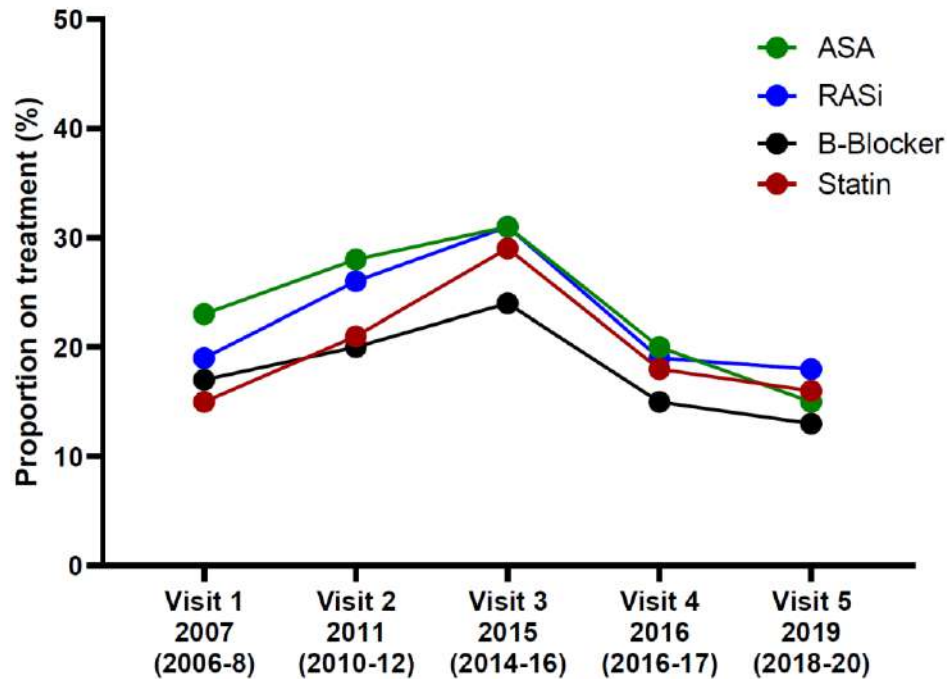
The largest gains in health (including CVD) globally in the next 25 years will depend more on our ability to implement what is already proven, than on new discoveries

PURE: CVD medication use in CVD secondary prevention

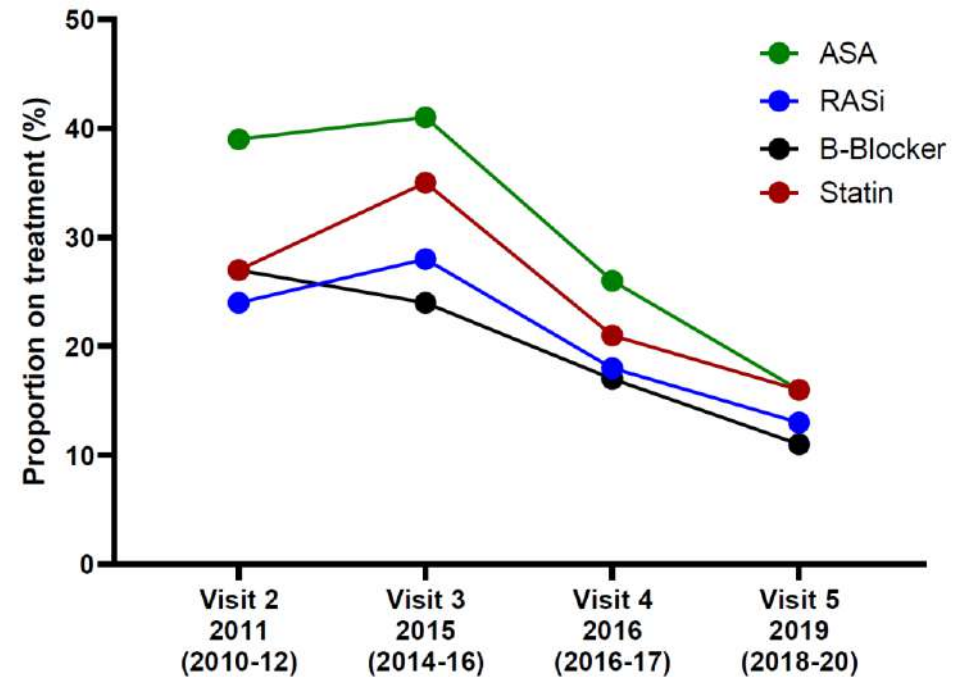


PURE: Trends in CVD medication use over time, 17 countries

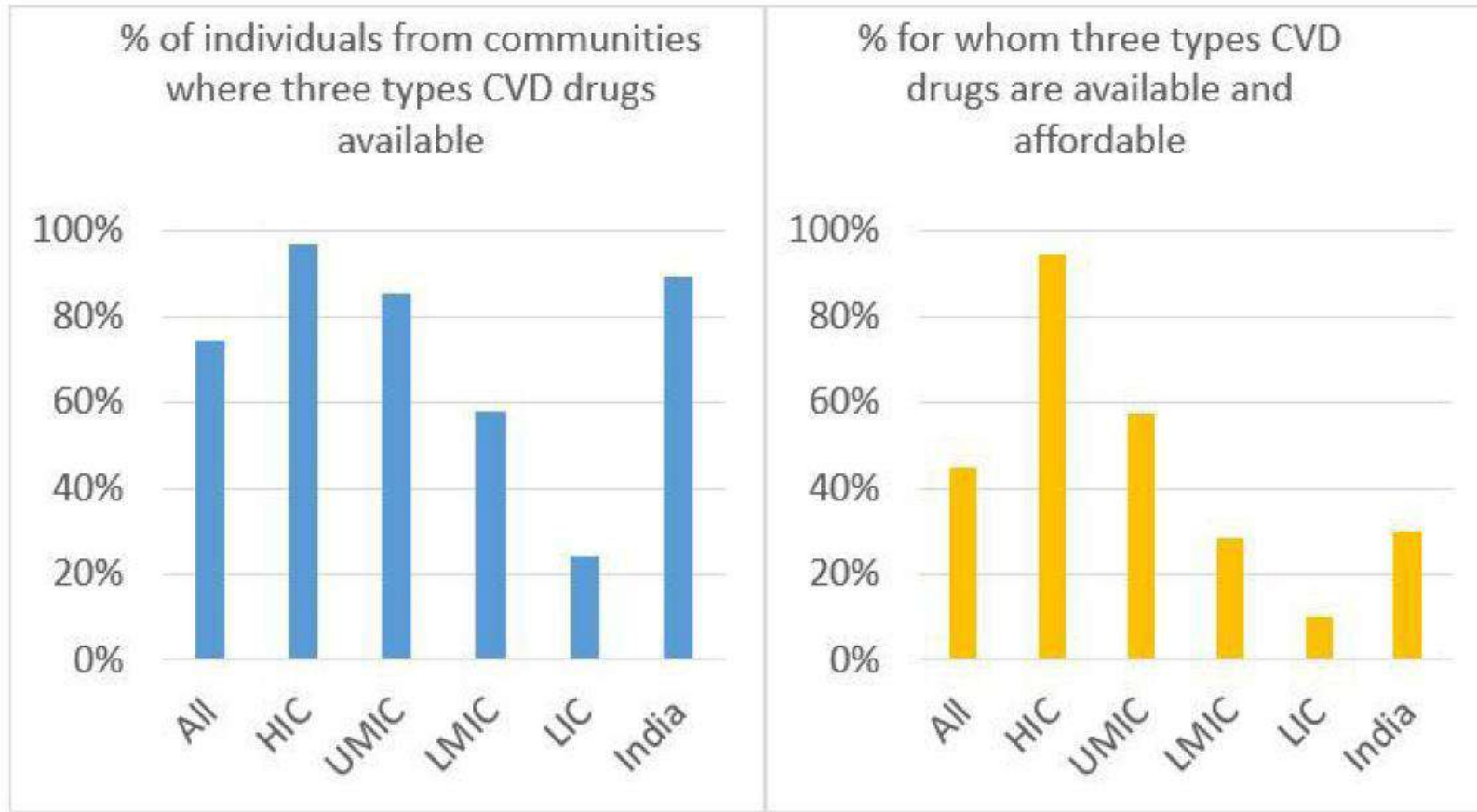
Participants with baseline CVD



New CVD cases at each follow up visit



PURE: CVD Medication Availability and Affordability



Global Hypertension Awareness, Treatment, and Control in 2000 and 2010

	Awareness, %		Treatment, %		Control, %	
	2000	2010	2000	2010	2000	2010
Global	41.4	46.5	31.8	36.9	11.7	13.8
High-income countries	58.2	67.0	44.5	55.6	17.9	28.4
Low- and middle-income countries	32.3	37.9	24.9	29.0	8.4	7.7

Mills KT, et al. Circulation. 2016;134:441–450.

Barriers to Hypertension Control and Strategies to Overcome Them

Levels	Barriers	Implementation Strategies
Patients	<ul style="list-style-type: none"> • Lack of hypertension knowledge • Inadequate access to care • Difficulty communicating with doctor • Poor adherence to medications 	<ul style="list-style-type: none"> • Health coaching • Home BP monitoring • Improving patient-provider communication • Family and social support
Providers	<ul style="list-style-type: none"> • Nonadherence to clinical guidelines • Insufficient time • Lack of standardization for BP measurement 	<ul style="list-style-type: none"> • Team-based care • Standardized treatment protocols • Interactive physician education sessions • Task sharing and task shifting
Health system	<ul style="list-style-type: none"> • Poor access to primary care • Lack of continuity of care • Medication costs and availability • Lack of reimbursement for health counseling 	<ul style="list-style-type: none"> • Team-based care • Medication titration by nurse or pharmacist • BP audit and feedback • Standardization of BP measurement • Low-cost drug plan
Community	<ul style="list-style-type: none"> • Difficulties with transportation • Limited community resources 	<ul style="list-style-type: none"> • Telehealth • Home medication delivery

The Roles of Community Health Workers in Hypertension Control

- A CHW is a trusted member of the community served. This trusting relationship enables the worker to serve as a link between health and social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery.
- **Roles in hypertension control:**
 - Screening and monitoring of BP in community
 - Health coaching on lifestyle changes and medication adherence
 - Connecting individuals to affordable healthcare programs and insurance
 - Navigating the healthcare system
 - Task sharing in team-based care
 - Providing social support to patients

Community health worker based interventions after acute coronary syndrome in India: SPREAD

Objectives: Among patients discharged after an acute coronary syndrome (ACS) in India

- To evaluate the impact of Community health worker (CHW) based intervention at one year on:
 - Adherence to Evidence Based meds, and Lifestyle modification

•Trial Design

- Open, multi center randomized controlled trial

•Key staff:

a)Community Health Worker (CHW)

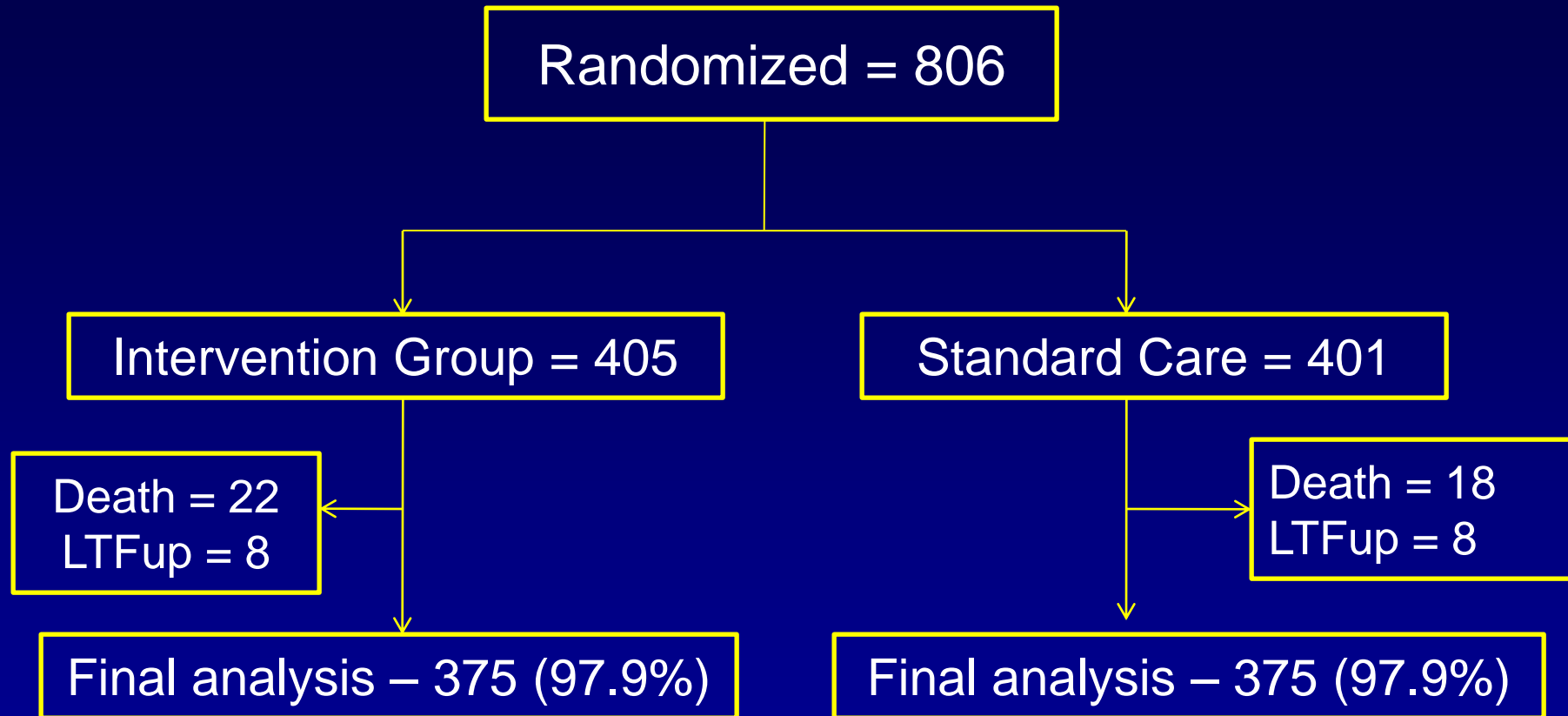
- 10 -12 grade education

b)SPREAD Project Officer (SPO)

- Graduate level education

Xavier D et al Lancet D&E, 2016

SPREAD : Study Flow



* 2 cross overs and 1 ineligible patient randomized

Xavier D et al Lancet D&E,2016

Primary Outcomes (one year)

Outcome	Interven N=375	Standard N=375	OR/ Mean diff	P value
Medications				
Adherent n (%)	361 (96.8)	345 (92.0)	2.60	0.006

Other outcomes at 1 year

	Intervention N=375	Standard N=375	Differrn	P value
SBP	124.4 (13.5)	128 (15.9)	-3.59	0.0009
BMI	24.4 (3.2)	25.0 (3.8)	-0.6	0.038
Waist males	90.60	92.58	-1.97	0.0009
Waist female	92.98	90.17	2.81	0.246

Other outcomes at 1 year

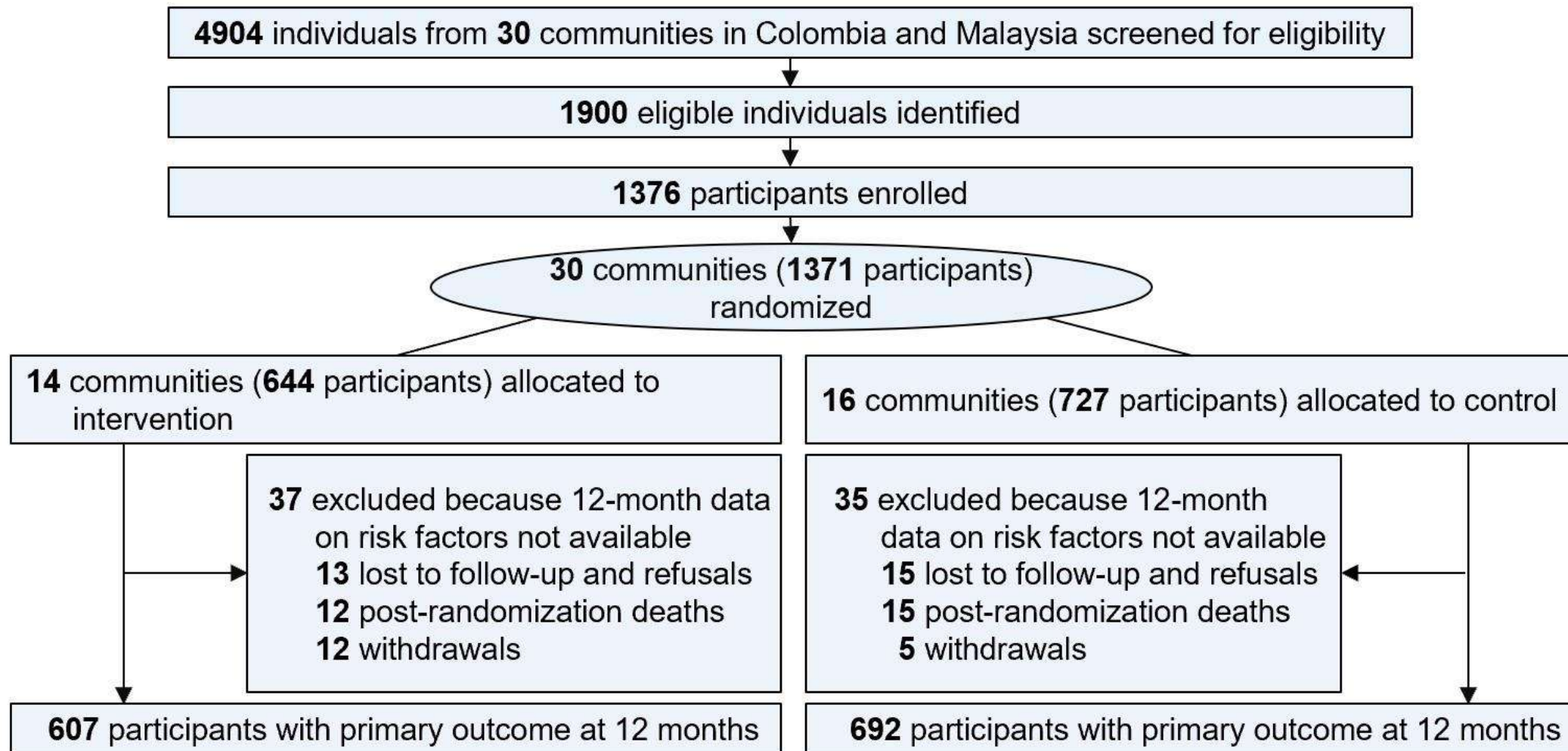
Outcome	Intervention Group N=375	Standard Care N=375	P value
Tobacco n (%)			
Stopped (181/267 smokers)	110 (85.3)	71 (51.5)	<0.0001
Alcohol Use			
Current n (%)	11 (2.9)	28 (7.5)	0.007
Physical Activity			
Modr to intense n (%)	333 (88.8)	226 (60.3)	<0.0001
Diet			
Diet score Med (IQR)	5 (3 – 5)	3 (3 – 5)	<0.0001

Other outcomes at 1 year

Variables*	Intervention N=375	Standard N=375	P value
HbA1c	7.1 (0.65)	8.0 (2.2)	0.051
Total Chol	157 (40.2)	166.9 (48.4)	0.184
Triglycerides	127.7 (43.8)	141.7 (48.7)	0.119
LDL	81 (20.6)	87.3 (29.9)	0.191
HDL	42 (11.4)	38.2 (6.5)	0.042

*Done in a subset of patients

Health Outcomes Prevention and Evaluation 4 (HOPE 4): 30 communities 1350 participants in Columbia and Malaysia



HOPE-4 Multifaceted Intervention Program

- **Community** screening, detection, treatment, and control of CVD risk factors by **NPHW** (in collab with physicians) guided by **tablet-based** simplified management algorithms, **decision support**, and **counselling programs**.
- **Free** combination antihypertensive drugs and statin **recommended by NPHW**, but supervised by physicians.
- Support from a participant-nominated **treatment supporter** (friend or family member) to improve adherence to meds and health behaviors.

Primary and Secondary Outcomes at 12 Months

	Baseline		Change over 12 Months		Net Difference	P-value
	Control (n=727)	Intervention (n=644)	Control (n=692)	Intervention (n=607)		
Mean FRS 10-year risk	35.47	32.63	-6.40%	-11.17	-4.78% (-7.11, -2.44)	<0.0001
Total cholesterol, mmol/L	5.37	5.35	-0.23	-0.68	-0.45 (-0.62, -0.28)	<0.0001
LDL, mmol/L	3.38	3.34	-0.19	-0.60	-0.41 (-0.60, -0.23)	<0.0001
HDL, mmol/L	1.14	1.19	0.07	0.04	0.03 (-0.09, 0.03)	0.32
Triglycerides, mmol/L	2.04	2.00	0.12	0.08	-0.04 (-0.20, to 0.13)	0.64

Blood Pressure Outcomes at 12 Months

	Baseline		Change over 12 Months		Net Difference	P-value
	Control (n=727)	Intervention (n=692)	Control (n=692)	Intervention (n=607)		
Systolic BP, mm Hg	151.8	152.1	-9.7	-21.1	-11.4	<0.0001
Diastolic BP, mm Hg	85.3	84.7	-2.9	-6.9	-4.0	0.0004
Controlled SBP <140 mm Hg	125	74	30.4	68.9	38.5	<0.0001
Controlled BP <140/90 mm Hg	115	68	28.4	64.8	36.4	<0.0001

Who are the Treatment Supporters in HOPE 4?

Type of Treatment Supporter	%
Spouse	48
Daughter	24
Son	10
Other Family	12
Friend	6

Treatment Supporter; Results:

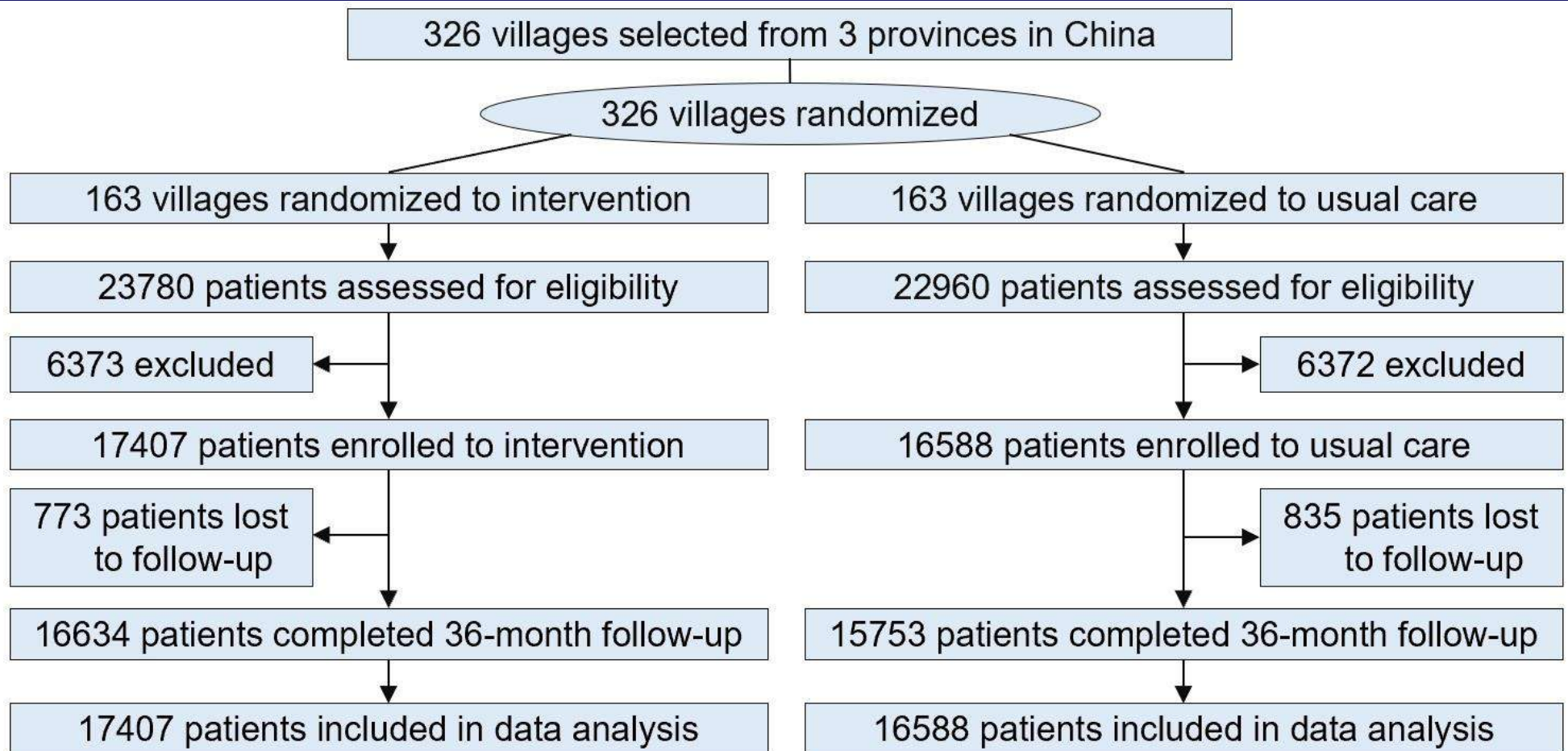
- 15.5% (95% CI, 6.2%–24.8%) greater increase in statin use (P<0.01) and a 2.3 mmHg (95% CI, –6.1 to 1.5) greater drop in mean BP (P=0.045).
- Improved Medication adherence.

High Adherence (MMAS-8 Score =8)	Treatment Supporter (< every visit)	Treatment Supporter (every visit)	P-Value
6 months (%)	48.2	61.0	< 0.01
12 months (%)	51.2	68.5	< 0.01

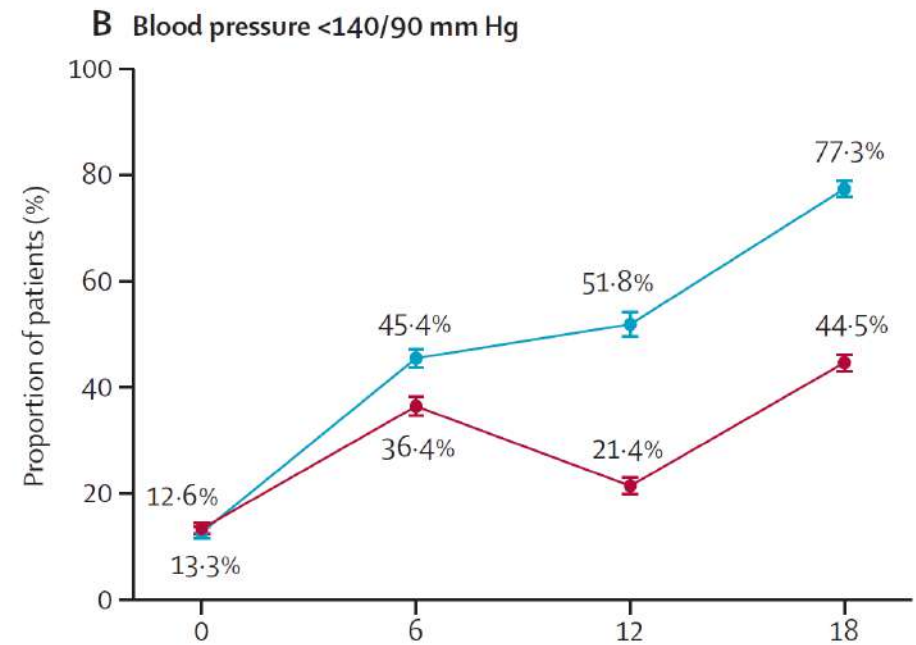
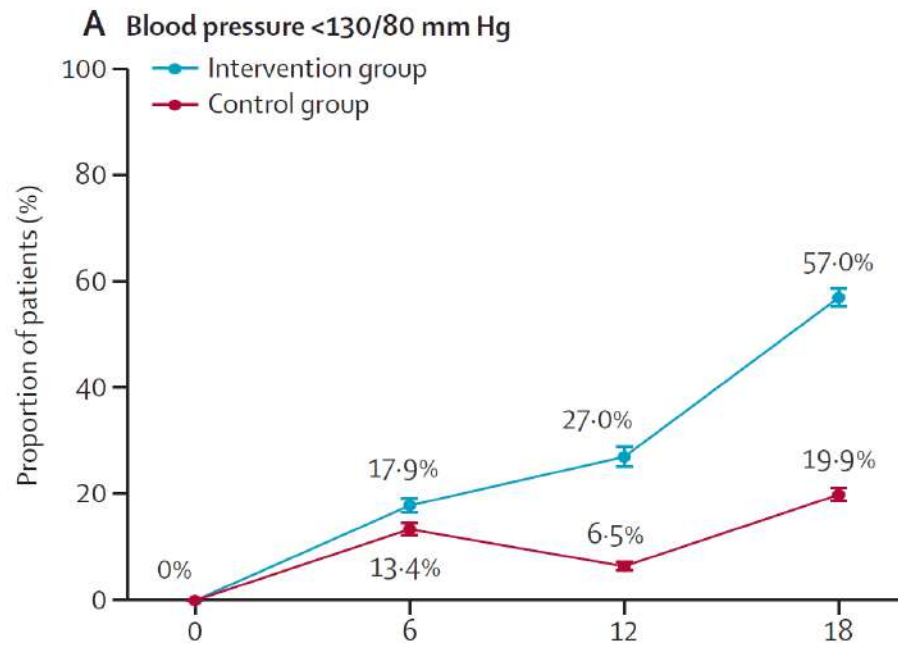
China Rural Hypertension Control Project

- Test effectiveness of a **village doctor-led multifaceted intervention** compared with usual care on BP control during 18-month intervention and CVD incidence during 36-month intervention among rural residents with hypertension in China.
- Previously known as barefoot doctors, village doctors are CHWs in rural China who serve on the frontline of primary health care.

Enrollment, Randomization, and Follow-up



Effectiveness of the Village Doctor-led Intervention on the Proportion of Patients With Controlled BP During 18-month Follow-up



Number of patients

Intervention group	17407	14781	14563	15414
Control group	16588	13831	12943	14500

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Sun Y, Mu J, ... He J. *Lancet* 2022; 399: 1964–75.

Effectiveness of the Village Doctor-led Intensive BP Intervention

Study outcomes	Intervention		Usual care		Hazard Ratio (95% CI)	P value
		Rate, % per year		Rate, % per year		
Primary outcome		1.6%		2.4%	0.67 (0.61, 0.73)	<0.0001
Myocardial infarction		0.2%		0.3%	0.77 (0.60, 0.98)	0.037
Stroke		1.3%		1.9%	0.66 (0.60, 0.73)	<0.0001
Heart failure		0.1%		0.2%	0.58 (0.42, 0.81)	0.0016
CVD death		0.4%		0.6%	0.70 (0.58, 0.83)	<0.0001
All-cause death		1.4%		1.6%	0.85 (0.76, 0.95)	0.0037

Keys to successful Implementation

- ***Simplified guidelines*** based on only the most robust and clearest evidence
- ***Assess practicality*** in local context
- Plan for ***implementation*** in ***local settings***
- ***Overcome barriers*** (availability, affordability, access, knowledge gaps)
- ***Partnerships*** between different types of health workers (MDs, nurses, pharmacists...and community organizations eg barber shops, community centers, etc) & family members
- ***Monitor impact*** through community and hospital registries

Implementation is by itself an important science that complements clinical sciences, epidemiology and RCTs