

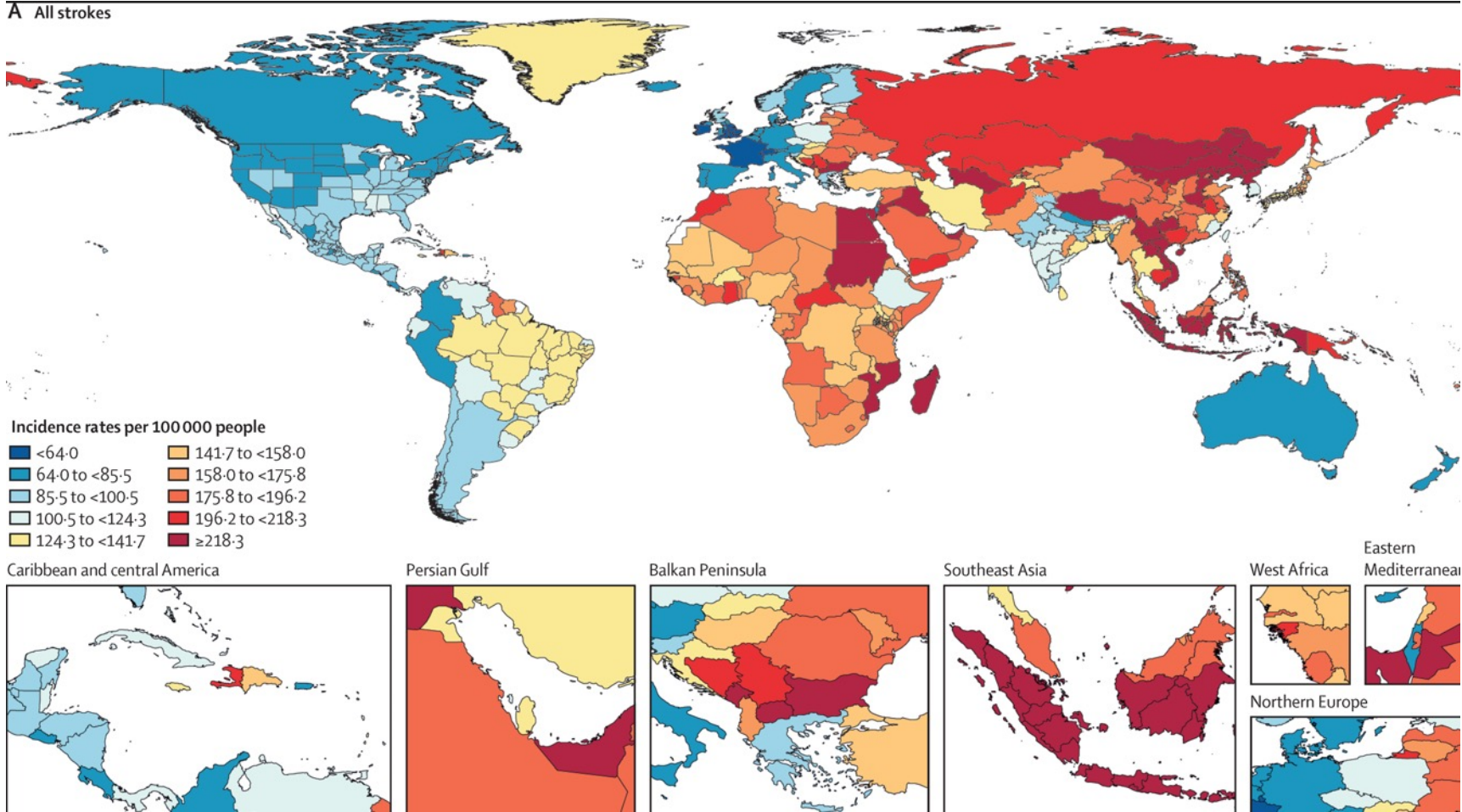
Stroke Secondary Prevention Managing Blood Pressure

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Dublin

Disclosures

- No conflicts to declare

STROKE INCIDENCE WORLDWIDE

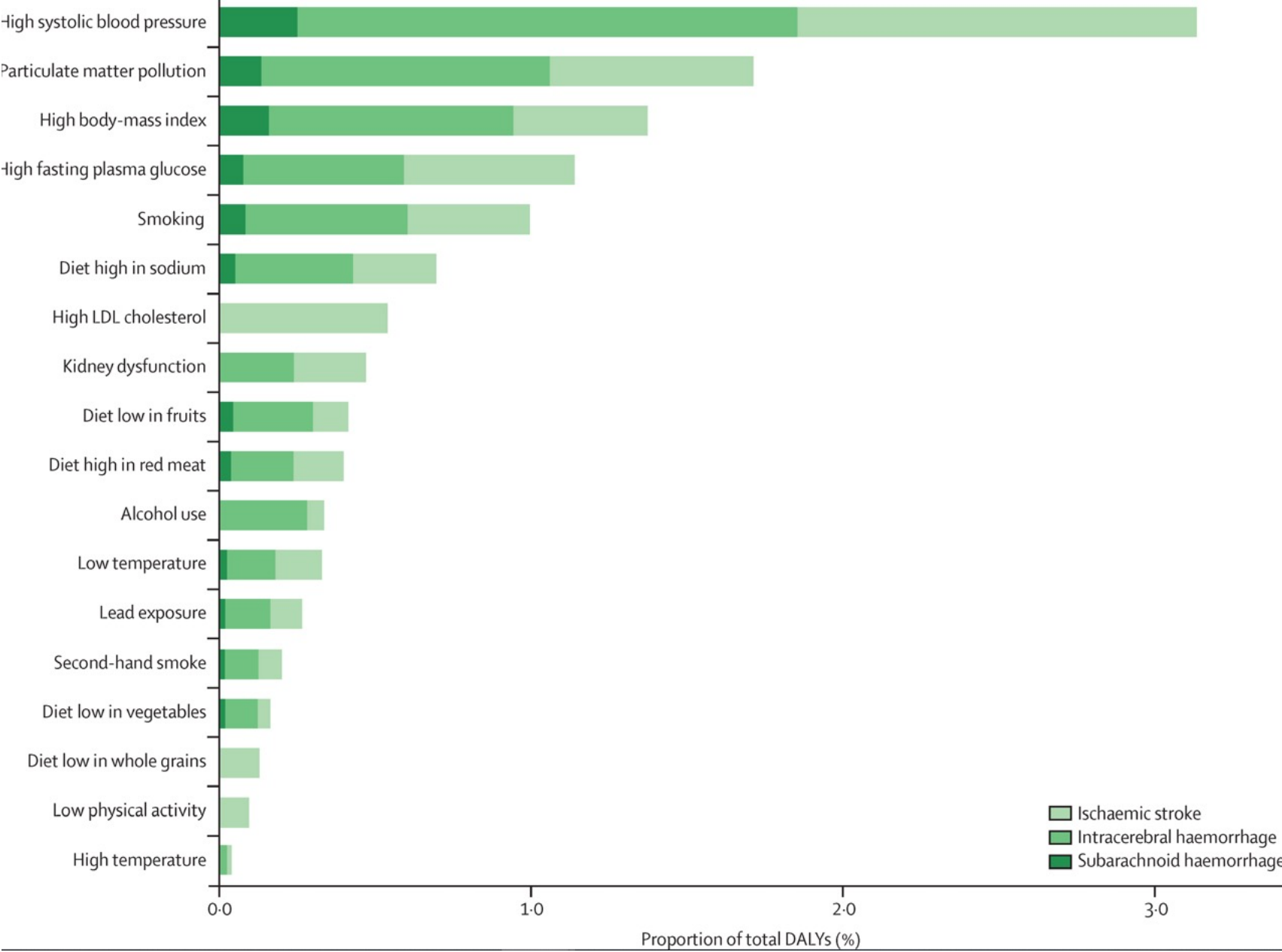


GLOBAL RISK OF STROKE

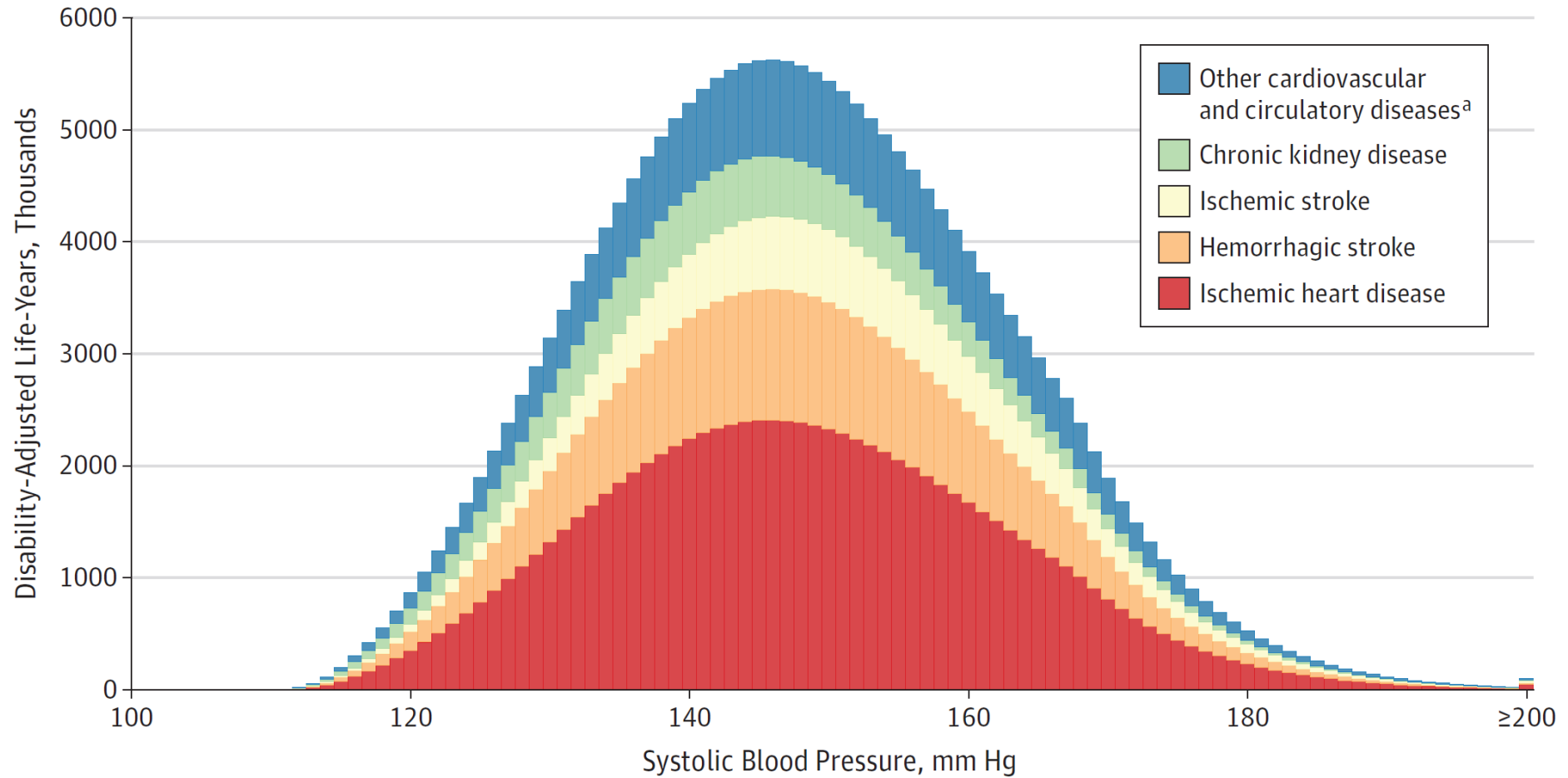
A All strokes

	Global	Central Asia	Central Europe	Eastern Europe	High-income Asia Pacific	Australasia	High-income North America	Southern Latin America	Western Latin America	Western Europe	Andean Latin America	Caribbean	Central Latin America	Tropical Latin America	North Africa and Middle East	South Asia	East Asia	Oceania	Southeast Asia	Central sub-Saharan Africa	Eastern sub-Saharan Africa	Southern sub-Saharan Africa	Western sub-Saharan Africa	
High systolic blood pressure	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
High body-mass index	2	2	2	2	2	4	2	2	2	2	2	2	2	2	2	4	5	4	2	4	3	2	3	
High fasting plasma glucose	3	3	3	5	3	3	3	3	3	4	3	3	3	3	2	6	2	3	3	4	3	4		
Ambient particulate matter pollution	4	4	6	7	13	5	12	6	9	3	6	4	7	4	3	2	12	5	5	9	4	5		
Smoking	5	5	4	3	6	2	4	4	4	8	4	6	4	6	6	3	5	4	8	7	5	9		
Diet high in sodium	6	10	5	12	14	7	11	10	12	9	14	8	8	17	10	4	8	7	14	5	14	11		
Household air pollution from solid fuels	7	14	16	19	20	19	20	19	19	11	5	10	15	14	5	12	3	6	2	2	8	2		
High LDL cholesterol	8	8	7	4	5	6	6	9	5	5	7	7	6	5	11	8	11	9	10	12	7	8		
Kidney dysfunction	9	9	11	8	8	11	8	11	10	7	8	5	9	7	9	11	7	8	9	10	9	7		
Diet low in fruits	10	11	12	11	9	8	10	13	11	13	12	11	13	13	7	13	6	11	6	6	6	6		
Diet high in red meat	11	7	9	9	4	10	5	5	6	6	13	9	5	15	19	7	10	14	15	14	11	14		
Low temperature	12	6	8	6	10	9	7	8	7	10	19	15	19	8	17	9	15	20	16	15	12	20		
Alcohol use	13	12	10	10	7	12	9	7	8	15	9	13	10	20	15	10	14	13	11	11	10	10		
Lead exposure	14	17	18	18	16	17	18	17	18	16	11	12	16	10	8	14	17	16	12	13	15	13		
Second-hand smoke	16	15	13	14	18	14	16	14	17	18	17	17	17	12	14	15	13	15	18	16	16	16		
Diet low in vegetables	17	19	19	17	15	18	14	15	16	12	10	14	11	18	12	19	9	12	7	8	13	12		
Diet low in whole grains	18	13	14	13	17	16	15	16	15	17	18	18	18	9	18	16	16	17	17	18	19	17		
Low physical activity	19	18	17	16	12	15	17	18	14	19	16	19	12	11	20	18	18	18	19	20	17	18		
High temperature	20	20	20	20	19	20	19	20	20	20	20	20	20	20	19	16	20	20	19	20	19	20	15	

STROKE RISK FACTORS

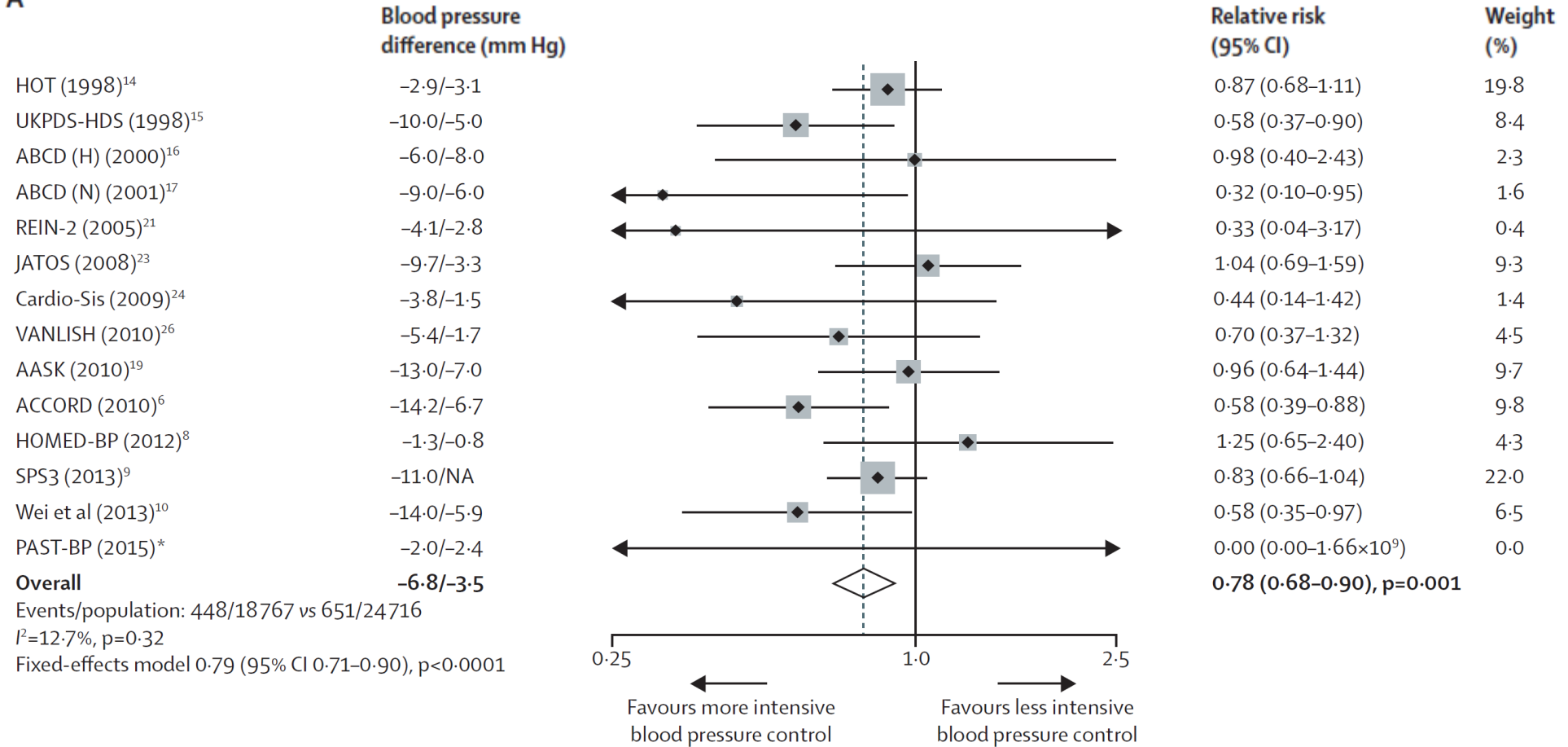


PROJECTED GLOBAL DALYs BY SBP 2015



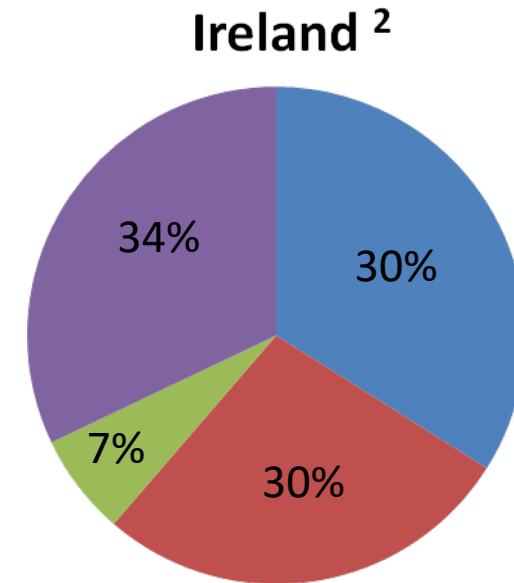
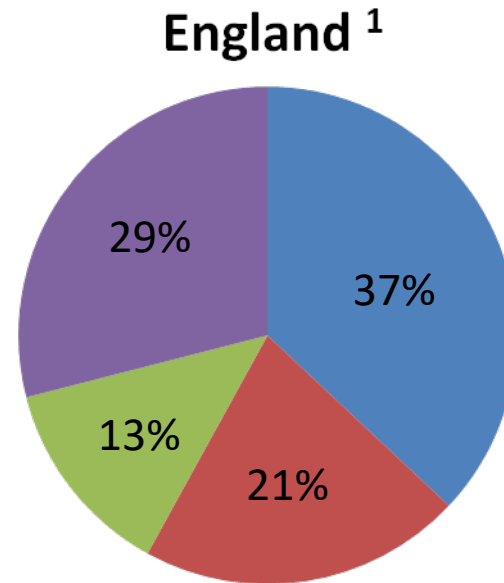
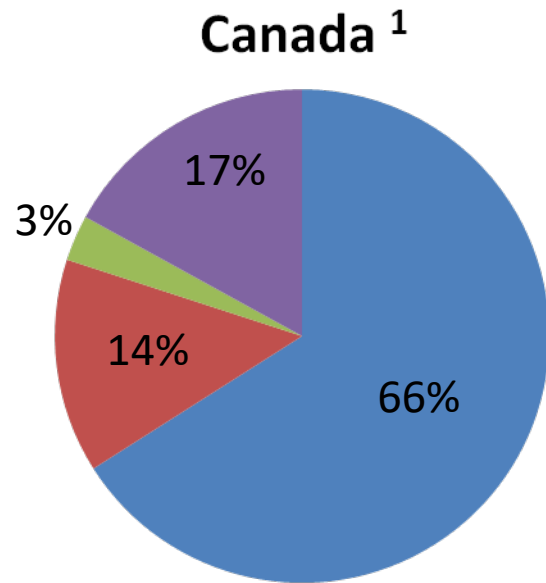
Effect of intensive BP lowering on Stroke outcome

A



	BP Target	Strength of Recommendation	Level of Evidence
AHA/ASA Secondary Stroke Prevention Ischemic Stroke and TIA (2021)	<130/80 mmHg	COR 1	RCT or Metanalysis
ESO(2022) Secondary Prevention Ischemic Stroke and TIA (2020)	<130/80 mmHg	Weak for intervention (vs < 140/90 mmHg)	Moderate
Canadian Stroke Best Practices (2020) Ischemic stroke (general)	<140/90 mmHg	B - Recommends	
Canadian Stroke Best Practices (2020) Subcortical stroke	<130/80 mmHg	B - Recommends	
Canadian Stroke Best Practices (2020) Intracerebral hemorrhage	<130/80 mmHg	B - Recommends	
AHA/ASA Guideline for Management of Spontaneous intracerebral hemorrhage (2022)	<130/80 mmHg	COR 2a	B-non-randomized

Comparative Management Statistics for Hypertension



■ = Treated and controlled ■ = Aware and untreated
■ = Treated and uncontrolled ■ = Unaware

(1) Lumley B et al. J Clin Hypertens 2015
(2) Unpublished data from Murphy CM et al. TILDA Study. J Publ Health 2015

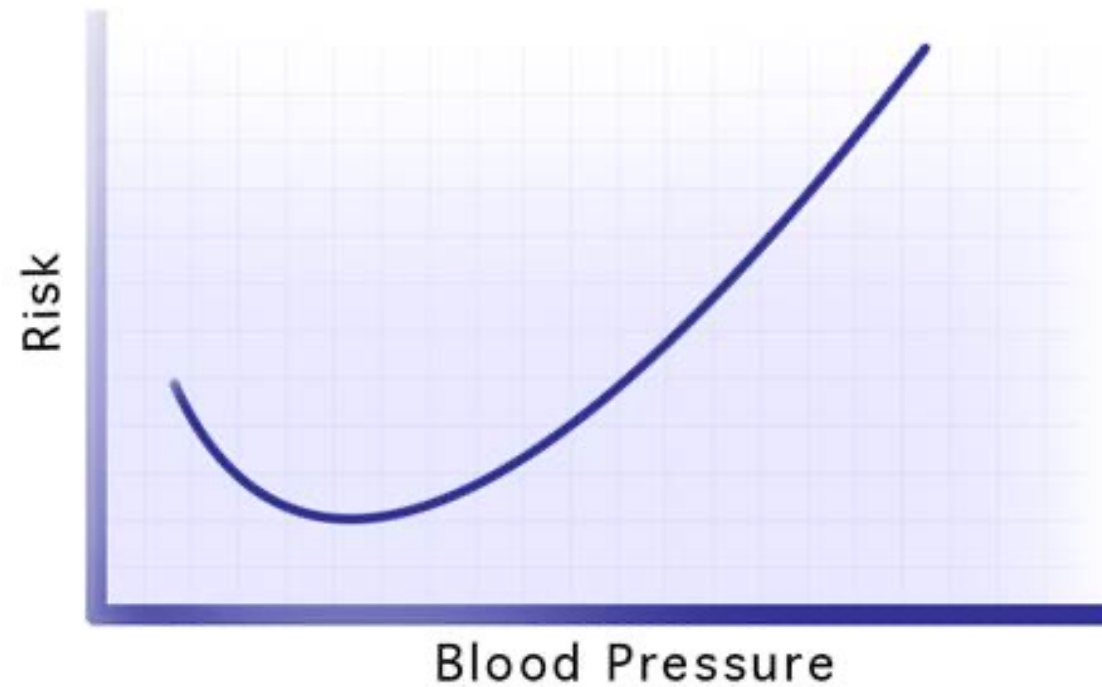
ASPIRE Study

Control of Blood Pressures ASPIRE Study

	N	Mean	SD	Min	Max	% at target
Clinic						
systolic	210	148	22.2	92	207	36.6%
diastolic	210	81	12.8	48	119	
24h^a						
systolic	210	127	15.5	90	222	58.6%
diastolic	210	73	9.6	53	116	
Day^b						
systolic	210	128	15.7	91	222	61.4%
diastolic	210	74	10.0	53	116	
Night^c						
systolic	197	121	15.1	88	176	43.6%
diastolic	197	68	9.7	48	95	

a =target 130/80; b = target 135/85; c=target 120/70, from European Society of Hypertension guidelines

RISK VS BENEFIT



Underlying Stroke Mechanism

- Haemorrhage
 - Central
 - Peripheral
- Ischaemic
 - Small vs Large vessel
 - Cardioembolic
 - Other

BP Monitoring techniques

- OFFICE BP
 - Automated office
- Ambulatory BP
- Home BP
- Telemonitoring
- Pharmacy
- Nurse



Validated blood pressure monitors



Home

 [Download](#)



Office/Hospital

 [Download](#)



Ambulatory

 [Download](#)



Children

 [Download](#)



Pregnancy

 [Download](#)

Nighttime Blood Pressure

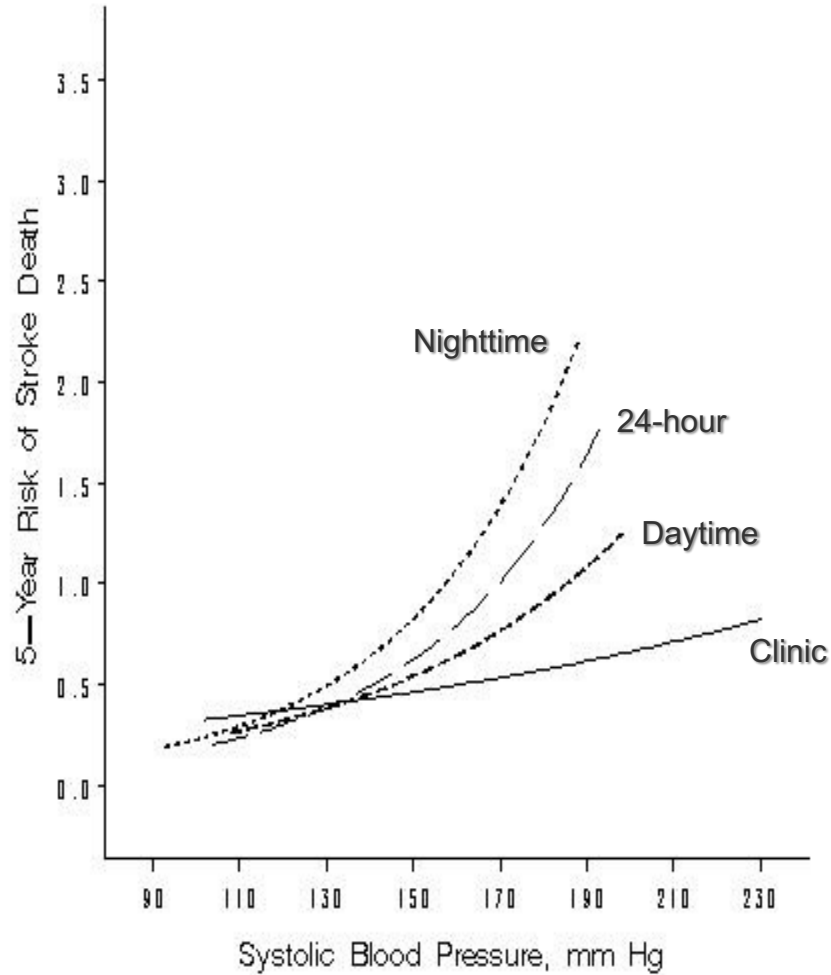


- Only associations with stroke risk – limited small interventional studies
- Non-dipping pattern
 - Time windows?
- OSA
- Other causes

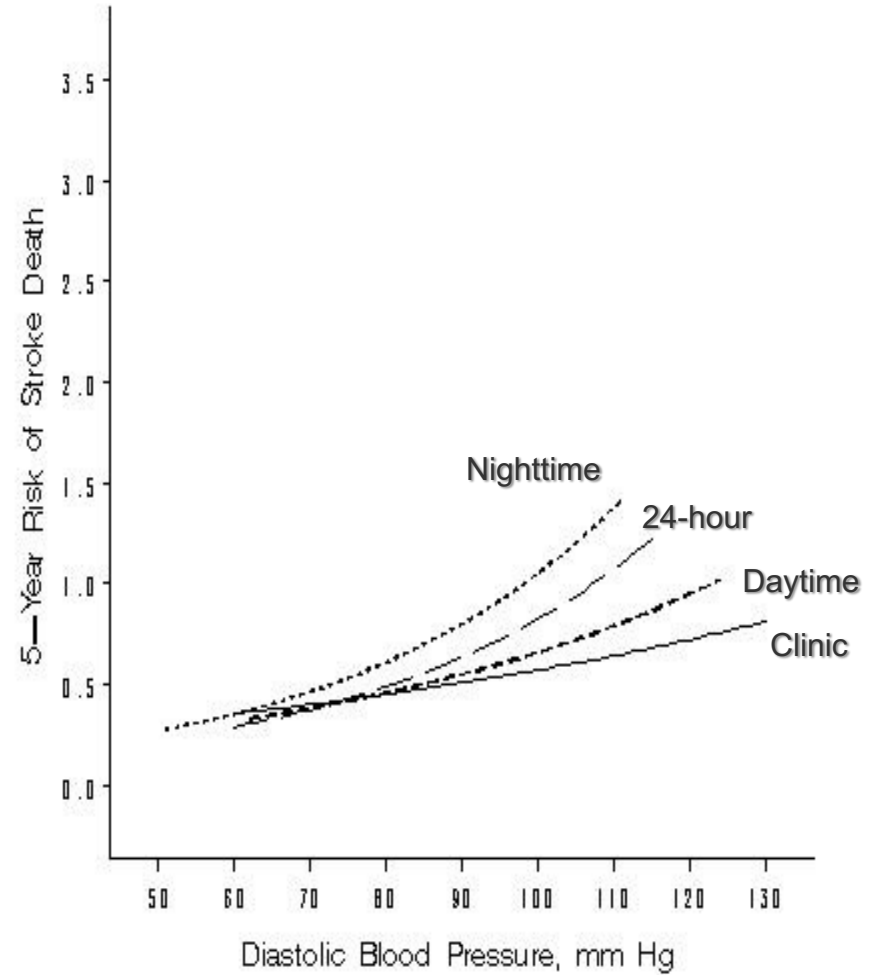
Automated BpTRU™ BP Devices



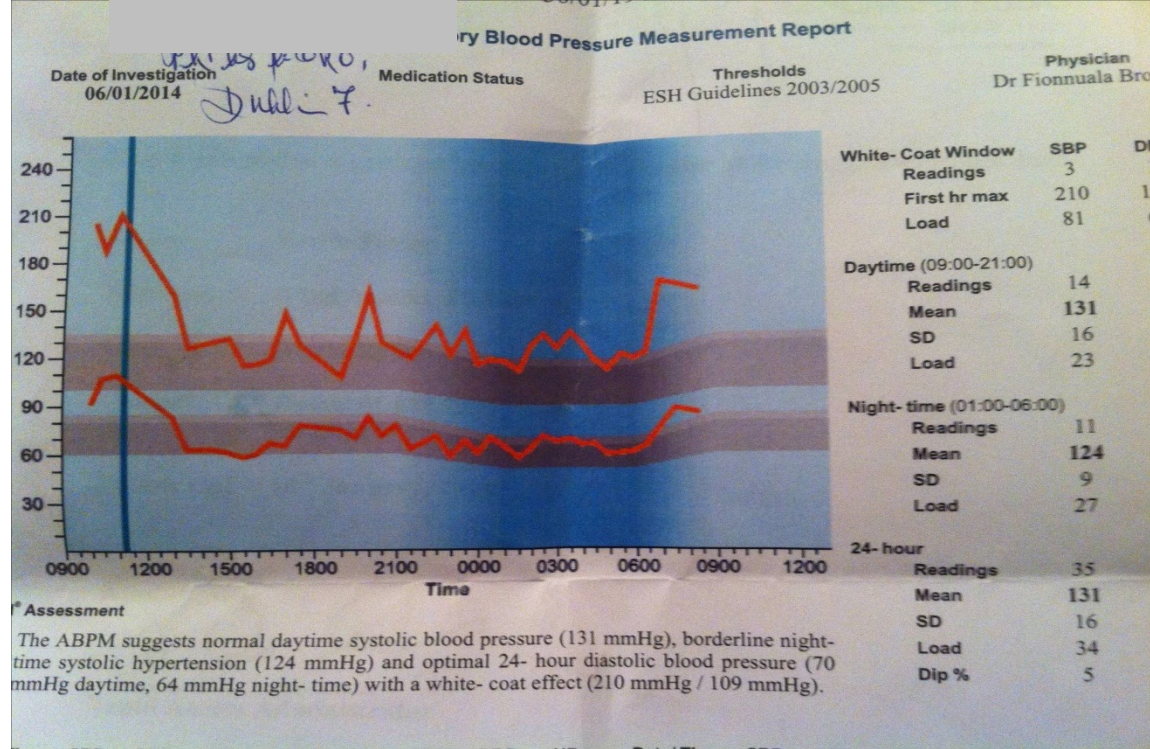
ADJUSTED 5-YEAR RISK OF STROKE EVENT ACCORDING TO CBPM AND ABPM



Adjusted for other covariates

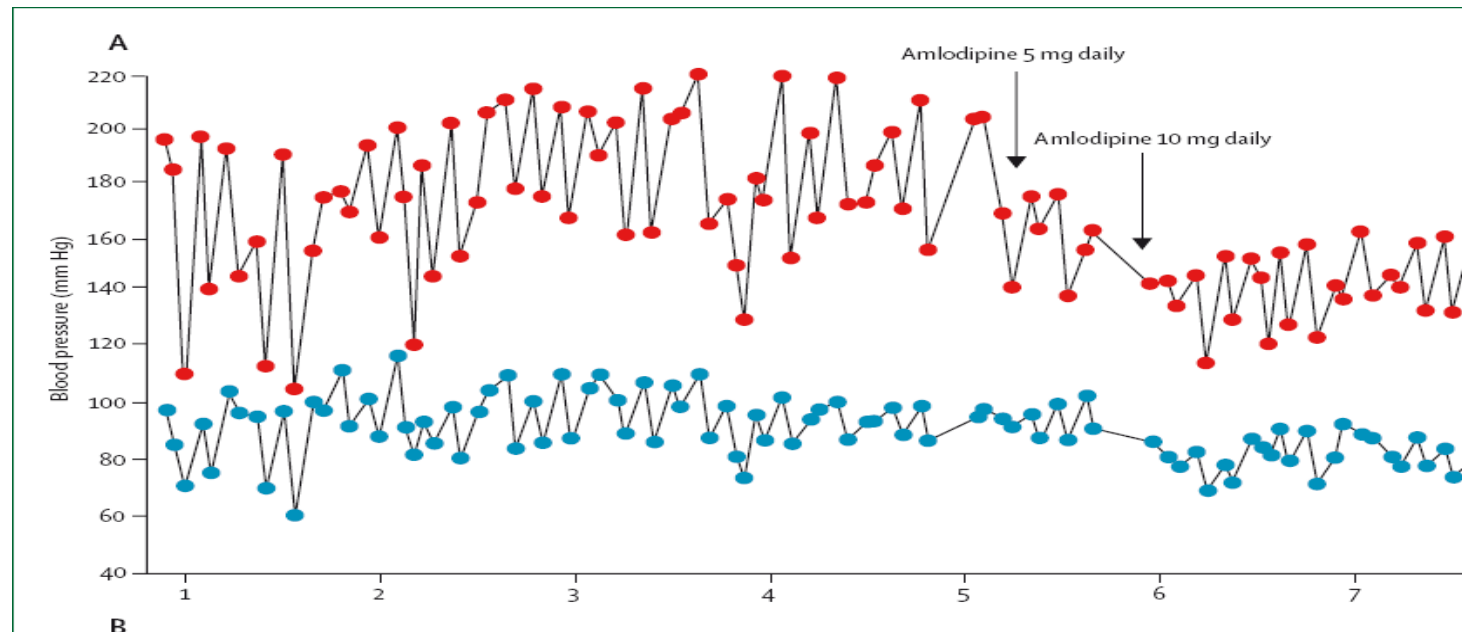


Dolan et al; Hypertension 2005



ABPM

HBPM



Comparison of Blood Pressure Measured by Different Techniques

Clinic	HBPM	Daytime ABPM	Nighttime ABPM	24-Hour ABPM
120/80	120/80	120/80	100/65	115/75
130/80	130/80	130/80	110/65	125/75
140/90	135/85	135/85	120/70	130/80
160/100	145/90	145/90	140/85	145/90

ABPM indicates ambulatory blood pressure monitoring; BP, blood pressure; DBP, diastolic blood pressure; HBPM, home blood pressure monitoring; and SBP, systolic blood pressure.

Whelton PK et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Hypertension*. 2018 Jun;71(6):e13-e115.

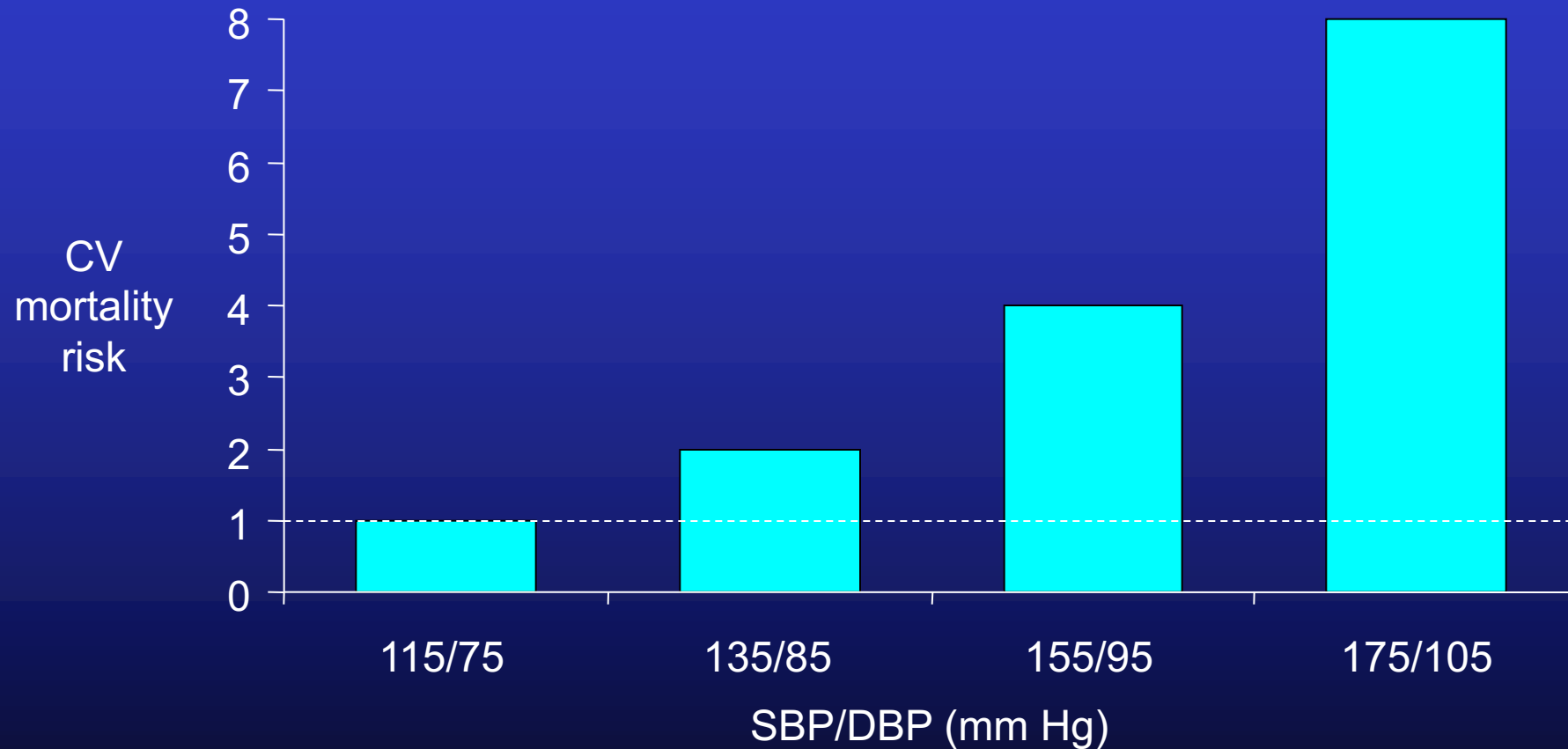
Lifestyle/Behavior

- Weight
- Exercise
- Alcohol
- Salt
- Motivation/anxiety
- Adherence
- Comorbidities
- Culture/ethnicity
- Secondary w/u

Medication

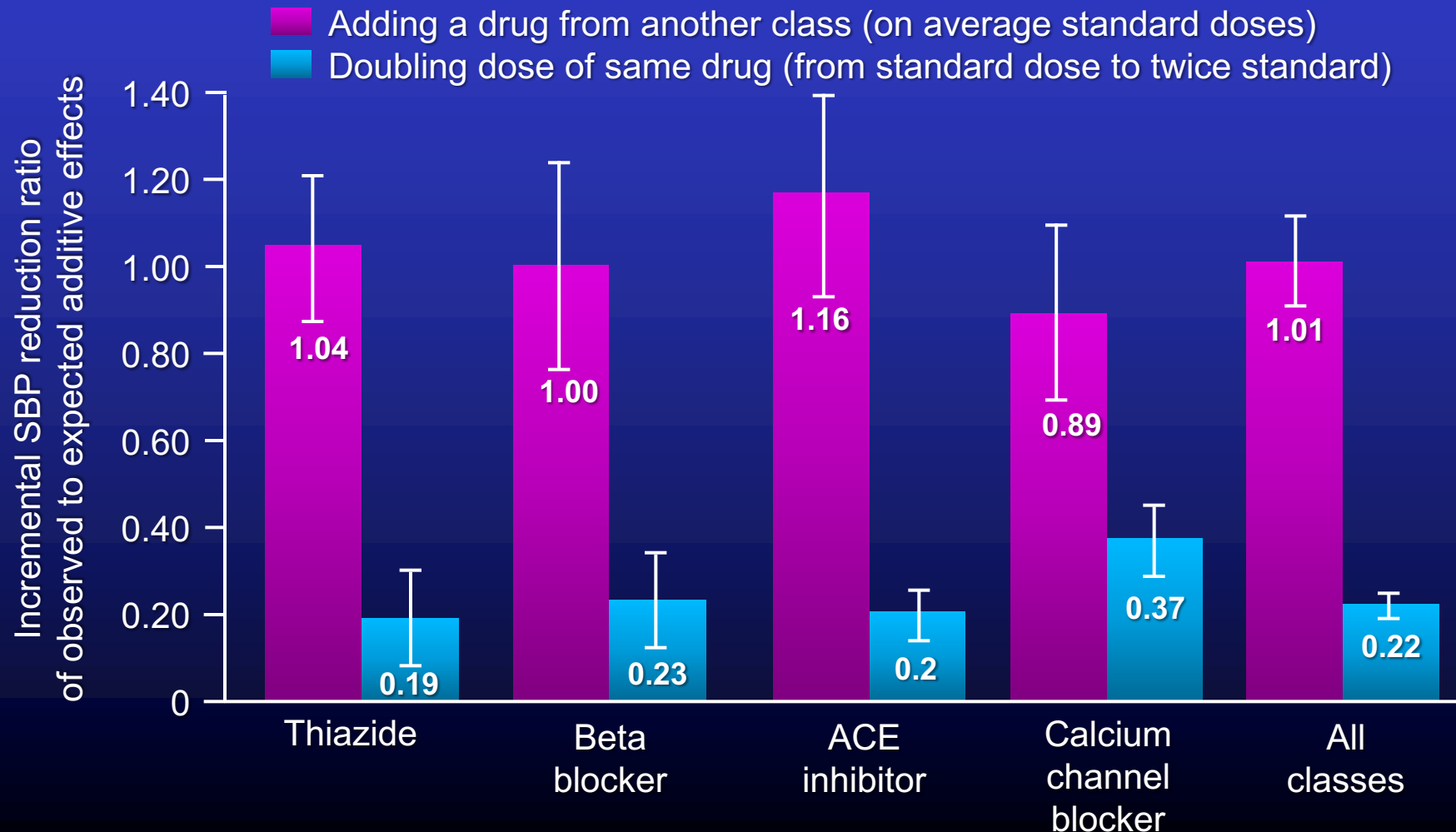
- Combination therapy
- Ace I/diuretic
- Amlodipine
- Chronotherapy
- Targets/overtreatment
- Resistant HT
- Older adults
- Orthostatic BP

CV Mortality Risk Doubles With Each 20/10 mm Hg BP Increment*



*Individuals aged 40-69 years, starting at BP 115/75 mm Hg.
CV, cardiovascular; DBP, diastolic blood pressure; SBP, systolic blood pressure.
Lewington S et al. *Lancet*. 2002;360:1903-1913.
Chobanian AV et al. *JAMA*. 2003;289:2560-2572.

Ratio of Observed to Expected Incremental BP-Lowering Effects of Adding a Drug or Doubling the Dose According to Drug Class



Thank you

