Prospective Urban Rural Epidemiologic (PURE) Study.

• 17 HIC, MIC and LIC countries, 628 urban and rural communities, 154,000 randomly selected, BP measured using an Omron with standard methods in 90%.

• Long term followup ongoing.

• Prevalence of hypertension, awareness, treatment & control. Info on types & costs of drugs used and distance from health facilities (EPOCH substudy).
153,996 individuals from 628 communities in 17 countries from 5 continents

143,830 (93.4%) had complete measures of BP and are included in these analyses
Hypertension prevalence, awareness, treatment & control

* among all patients with hypertension

N = 143,830

- Prevalence: 40.7%
- Awareness: 46.4%
- Treated: 40.6%
- Controlled: 13.1%

* among all patients with hypertension
Prevalence of Hypertension

HIC | UMIC | LMIC | LIC
---|------|------|-----
Urban | Rural |

Female | Male

Low education | Middle education | High education

%
Awareness, treatment and Control by urban-rural location

Awareness

Treatment

Control
The gap in control of blood pressure

Treated among those aware of their HT

Controlled BP (<140/90) amongst those receiving treatment
Treatment of hypertension – No. of BP lowering medications

- LIC
- LMIC
- UMIC
- HIC
- All

- 1 medication
- ≥2 medications
Barriers to HT control

Health service
Access, Availability, Affordability

Clinician
Knowledge, attitudes and behaviours

Patient
Individual factors
Adherence

Data from 4783 patients with HT in phase IV clinical studies monitored with a medication event monitor (MEMS), archived in database for 1989 – 2006.

About half of the patients who were prescribed an antihypertensive drug had stopped taking it within 1 year. On any day, patients were still engaged with the drug dosing regiment omitted about 10% of the scheduled doses: 42% of these omissions were of a single day’s dose, whereas 43% were part of a sequence of several days. About half of patients had at least one drug holiday a year.

Morning takers were more likely to take meds than evening takers (1.38, 1.36 – 1.41). Sunday morning was when morning takers missed most doses.

Vrijens. BMJ 2008 17;336(7653):1114-7
BP Control by category of medication adherence

- High: ≥ 80% (43%*)
- Medium: 50%-79% (34%)
- Low: <50% (33%)

*P = 0.06 prior to adjustment; P = 0.026 in regression analysis

Bramley J Manag Care Pharm. 2006;12(3):239-45
Cross-country differences in control and medication increases

Data from 21,053 hypertensive patients visiting 291 cardiologists and 1284 primary care physicians, Cardiomonitor 2004

Medication increases were a dose escalation or an addition to or switch of drug therapy

Wang Arch Intern Med. 2007;167:141-147
Reasons for not Intensifying Antihypertensive Treatment (RIAT) survey

- Representative samples of physicians in 16 countries, 1596 centres in Latin America, Eastern Europe, Africa, Asia enrolled hypertensive patients
- 32,224 (91.4%) complete follow up to visit 4
- Mean interval between each visit ~1 month
- Baseline BP 159/95
- Most physicians defined a target BP for their patients identical or lower than the one specified by national or international guidelines
Reasons for not Intensifying Antihypertensive Treatment (RIAT)

- Awaiting full drug effect or time too short
- Target almost reached or clear improvement
- Compliance
- Reduction of other risk factors
- Side effects
- Good self-measurements, White-coat hypertension
- Other reasons

Legend:
- Visit 2
- Visit 3
- Visit 4
Physician perceptions about BP targets and acceptable BP levels

- Survey of 2629 European physicians in 2009
- 95% of physicians felt that patients SBP needed to be higher than the guideline recommended goal levels before taking immediate action
- The mean levels of SBP/DBP that physicians reported they were satisfied with - 132/82, concerned about – 149/92, or would cause them to take immediate action was 168/100
Access, Availability & Affordability of treatments
Relation of per capita health expenditure to Treatment for HT

\[ R^2 = 0.4402 \]

![Graph showing the relationship between per capita health expenditure and Treatment for HT, with an R squared value of 0.4402.](image)
Adequate BP control and health insurance status

Adjusted odds ratios of adequate hypertension control among 1999–2002 NHANES participants, by insurance status

- Private insurance
- Medicare without private insurance
- Medicaid
- No insurance

Odds ratio (95% CI)

Private insurance: 0.80 (0.61 – 1.05)
Medicare without private insurance: 0.75 (0.47 – 1.20)
Medicaid: 0.63 (0.44 – 0.92)
No insurance: 1.0 reference
No. of **days** of income required to meet cost of 1 month medications

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*Zimbabwe & Bangladesh not included in this analysis

Unpublished, EPOCH & PURE
Types of treatments for HT by economic status of country

![Bar chart showing the types of treatments for HT by economic status of country. The chart compares HIC, UMIC, LMIC, and LIC regions. The most used treatments are ACE/ARB, Diuretics, Betablockers, and Calcium antagonist.](image)
Distance to health services and Control

% of those with HT with BP<140/90 vs Distance to health services (km)

R² = 0.2103

Unpublished, EPOCH & PURE
Conclusions

- Control of hypertension is poor globally
- Patient adherence and Physician inertia appear to be common barriers
- Health system level barriers are likely to be more complex and vary across settings
Approaches to reduce the Gap in Hypertension.

- **Large screening gap**: Systematic measurements of BP & risk factors in adults every 5 yrs by NPHW.
- **Control gap**: Use combo therapy initially (2 or 3 drugs at half doses).
- **Controlling key risk factors**: Prescribe low dose statins to all irrespective of lipid levels. (perhaps the polypill)
- **Lifestyle modifications**: On top of drugs, instead of initial attempt.
- **Ensuring low cost**: Cheapest combinations
- **Maintaining adherence**: NPHW reinforcecments.