

Asking an answerable research question to contribute to “25 x 25”

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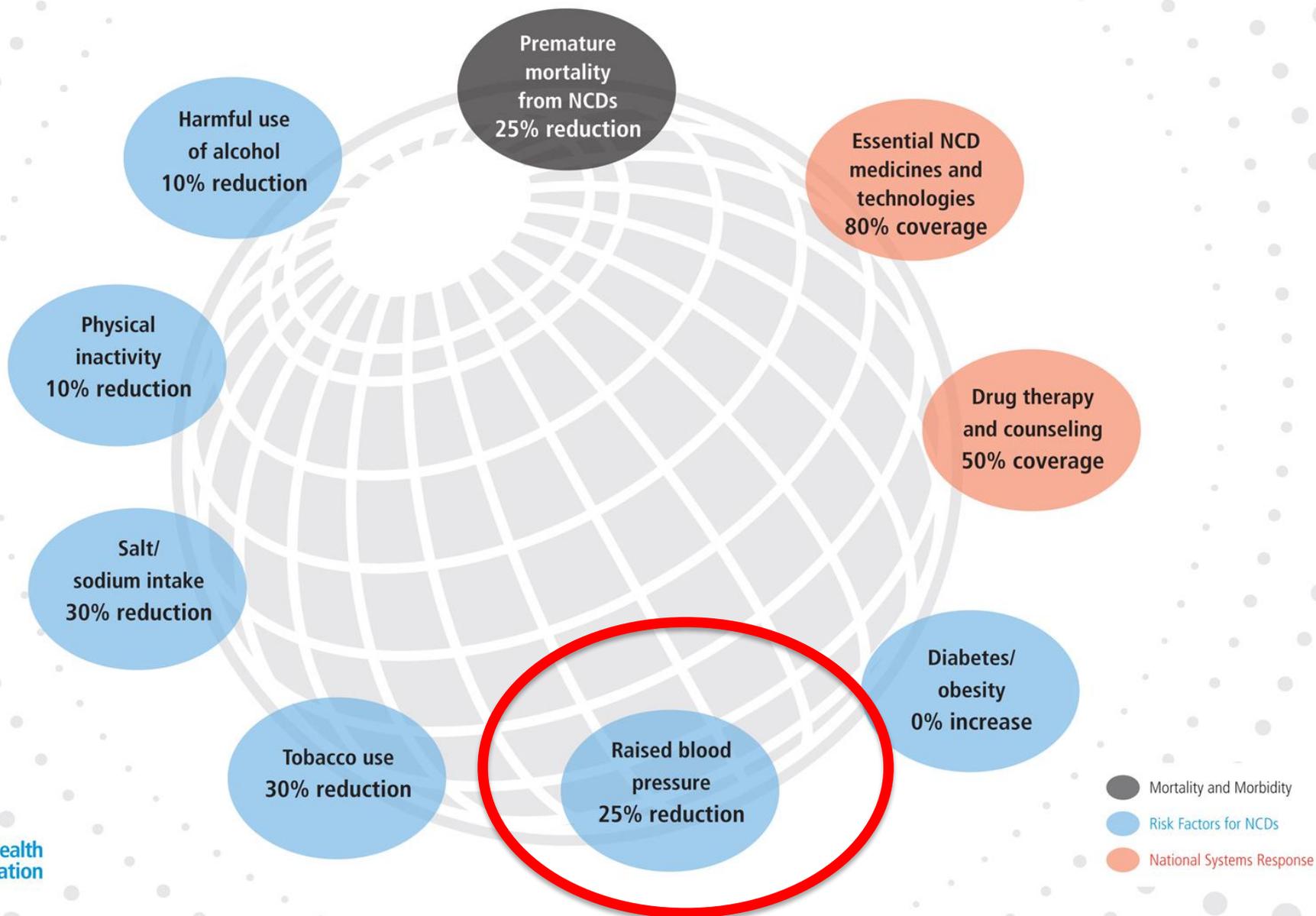
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Asking a research question: Outline

- **Identifying the problem and asking the overarching question?**
- **Understanding the challenges from multiple angles**
- **Identifying resources, Innovations and approaches**
- **A case study**

Set of 9 voluntary global NCD targets for 2025



Larger Question

- Can we reduce high blood pressure burden in India by 25% in the next 12 years ?

What is needed ?

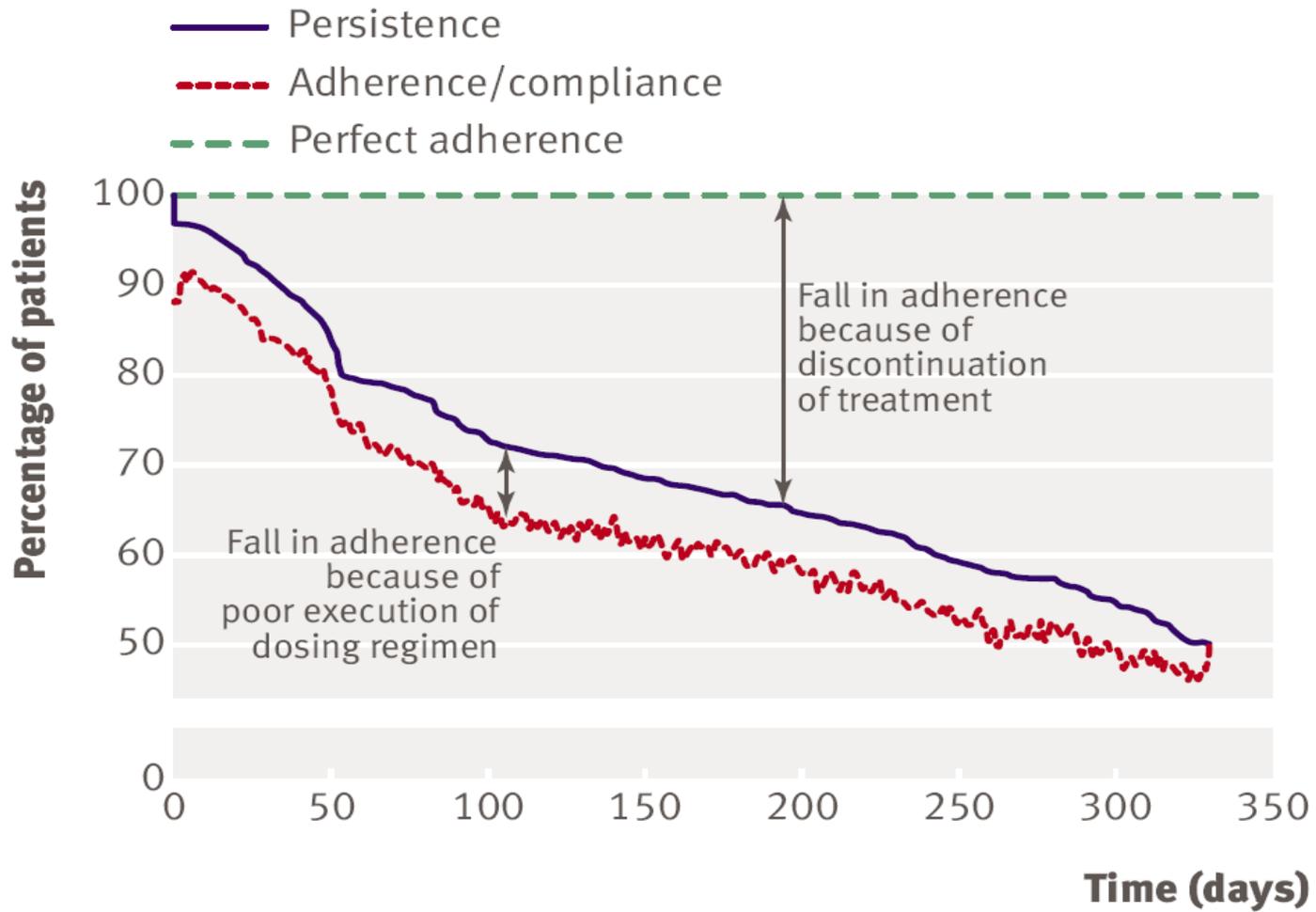
- **We need a benchmark to start with!**
 - Situational analysis/ Epi data/Surveillance
- **We need to know what works and what does not?**
 - Clinical trial evidence (drugs; strategy etc)
- **Will the policy makers be receptive?**
 - Policy research
- **Is there enough financial resources?**
 - Economic modeling; costing; utility; Best buys
- **Do we have enough human resources**
 - Physicians/non physician health care providers
- **Will the non health sector be receptive**
 - Establishing a multi-disciplinary structure and multi sectoral framework

What do we know ?



..... Control of blood pressure is no longer disputed & is supported by most impressive evidence base accumulated over the last 40 years both for individuals and populations

Compliance with BP Medicines in the UK



No of patients remaining in study	3108	980	828	618	474	400	331
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Beyond Policy: Main Challenges?

Health system challenges

- Lack of access
- Uneven distribution of health care
- Curative care over prevention
- Insufficient human resources
- Lack of clear guidelines

Individual challenges

- Costs of care and out of pocket expenditure
- Compliance
- Inability to change behaviors

Several Innovations have the potential to overcome these challenges

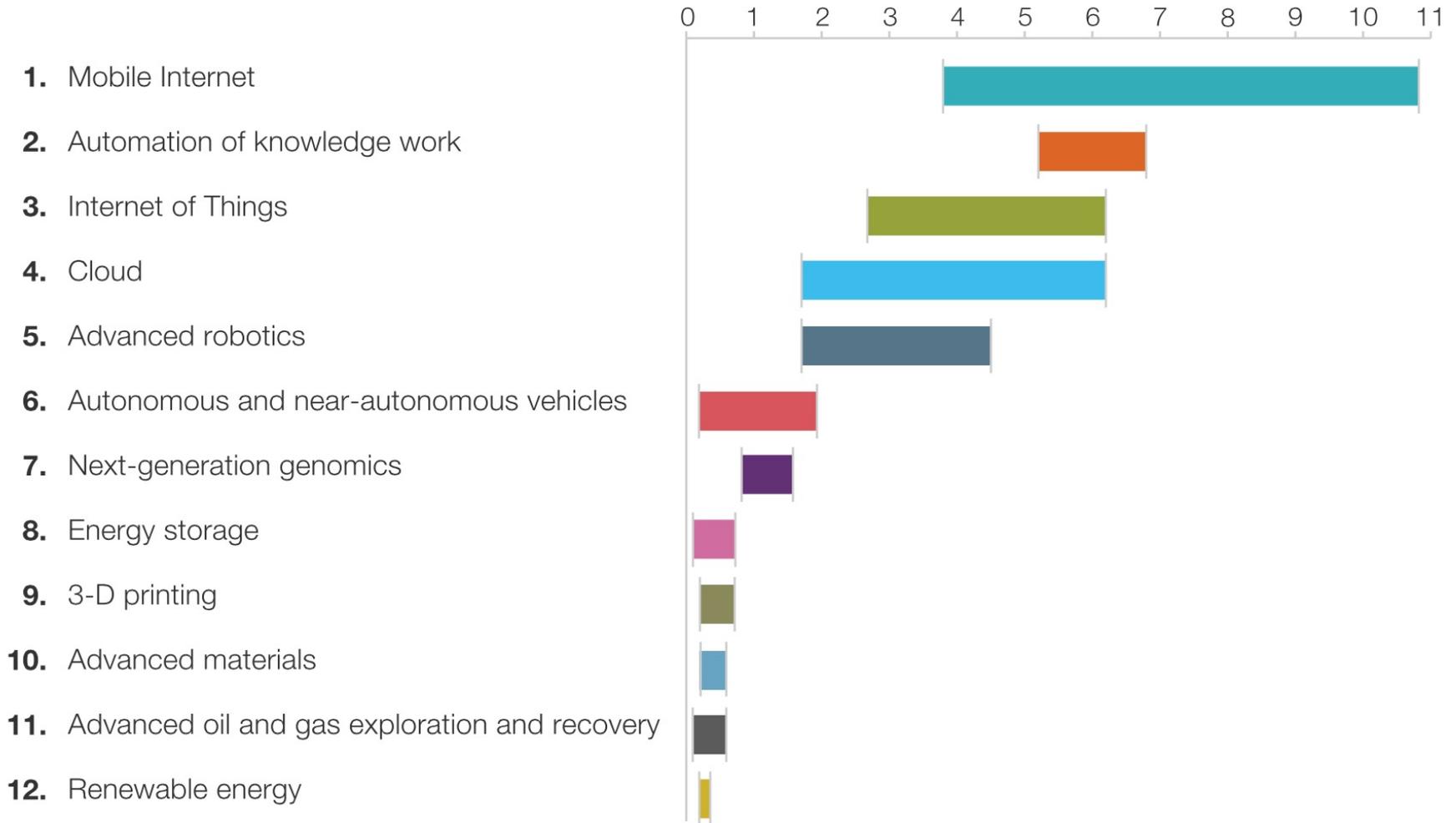
What are the innovations needed for hypertension management and control

- **Individual level**
 - Improving compliance
 - FDC
- Health system strengthening through task shifting and task sharing; team based care
- Role of structured behavior change using frontline health care workers
- Population level Salt reduction
- Integration of chronic care
- Setting based interventions
- Use of affordable technologies

- **Health system strengthening through task shifting and using inexpensive technology**
 - An example of disruptive innovation
- **Disruptive innovation** : An innovation that creates a new market by applying a different set of values, which ultimately (and unexpectedly) overtakes an existing market.

A gallery of disruptive technologies

Estimated potential economic impact of technologies across sized applications in 2025, \$ trillion, annual



mHealth technologies

- Consumers : improved convenience, more active engagement in self-care, and greater personalization.
- Clinicians: Reduced demands on time and refocus on the art of medicine.
- Potential to change every aspect of the health care environment and to do so while delivering better outcomes and substantially lowering costs

Need: Real-world clinical trial evidence to provide a roadmap for implementation

Health System Intervention: Approaches

- **Inter/multidisciplinary**
- **Trans Disciplinary**

Inter disciplinary research

- Simple: Collaboration on a question of mutual concern to investigators from different disciplines e.g.; TB In individuals with diabetes
- Complex: Prevention of obesity

Multidisciplinary Resaerch

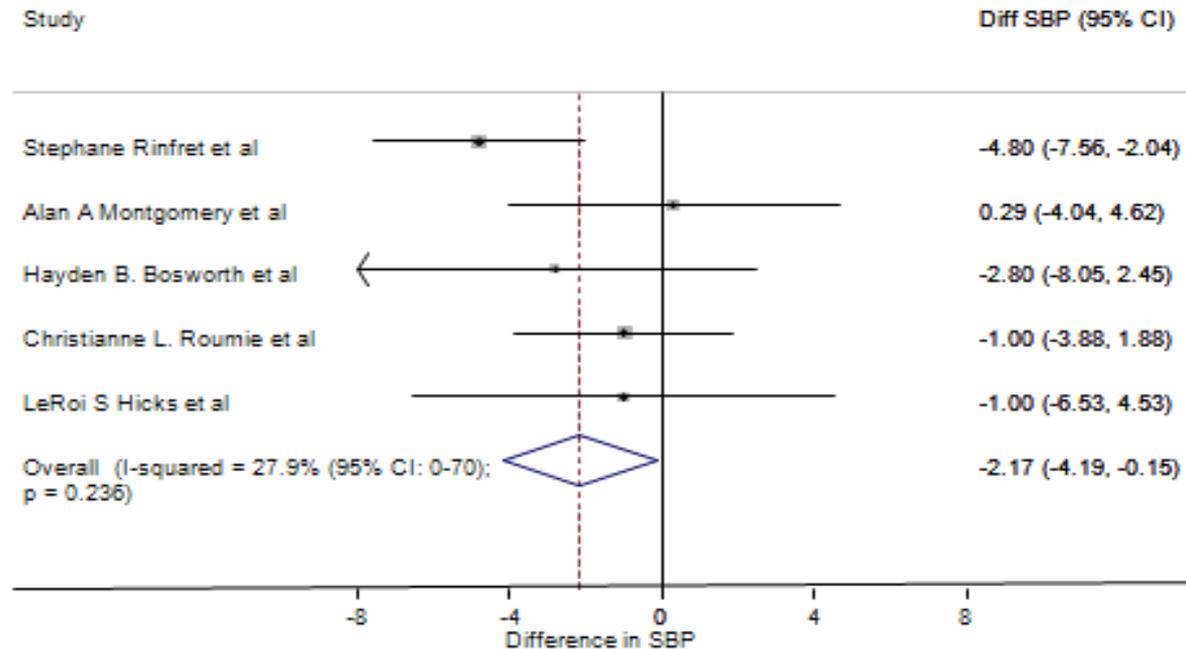
Study of multiple facets of a problem, with questions of both separate and convergent interest to investigators, eg; cardiologists, biochemists, geneticists, public health experts, policy makers.....)

From asking a research question to scaling up: an example

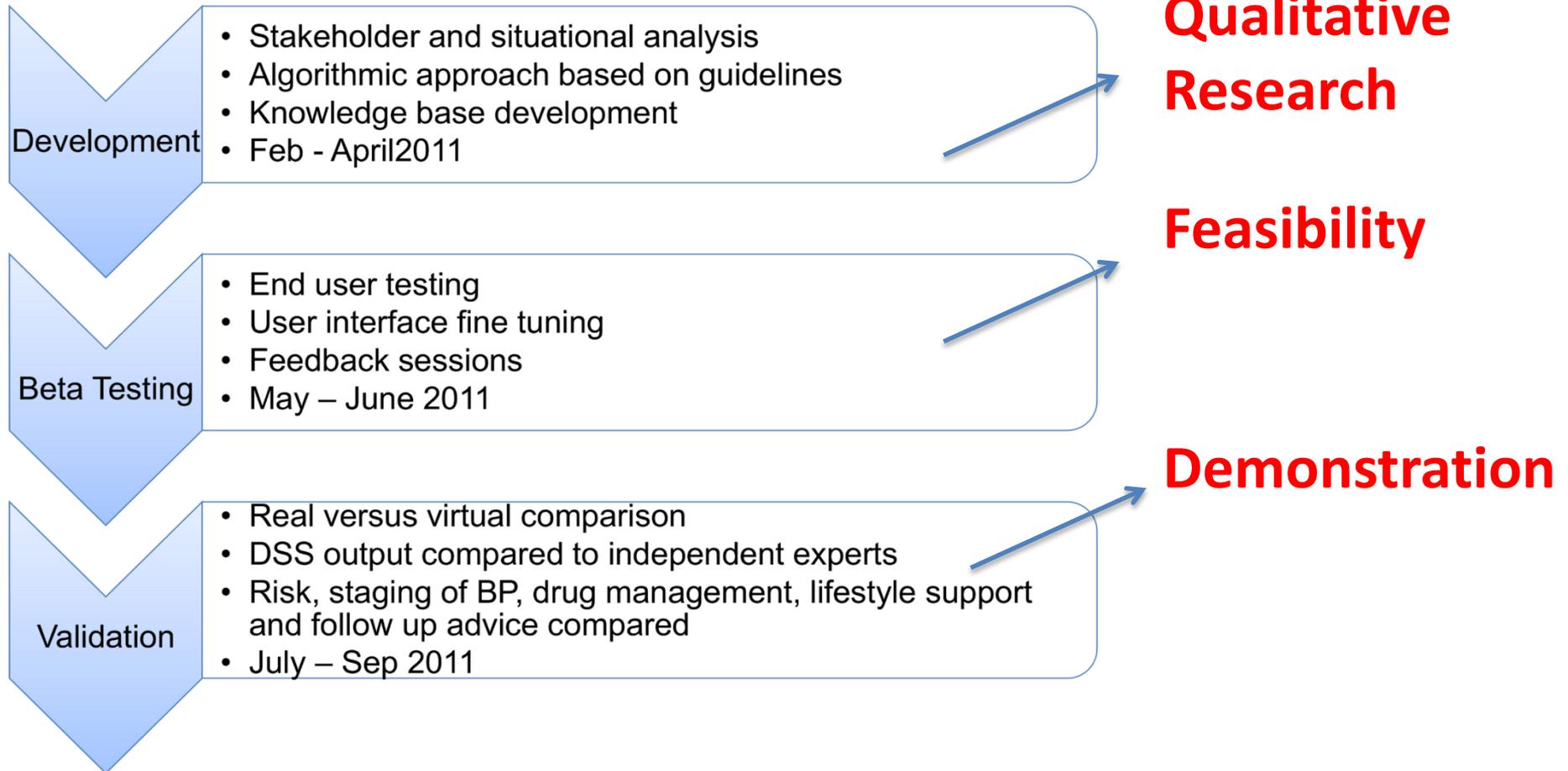
Can we demonstrate the efficacy of frontline health workers enabled with IT or smart phones in reducing outcomes for patients with hypertension and diabetes ?

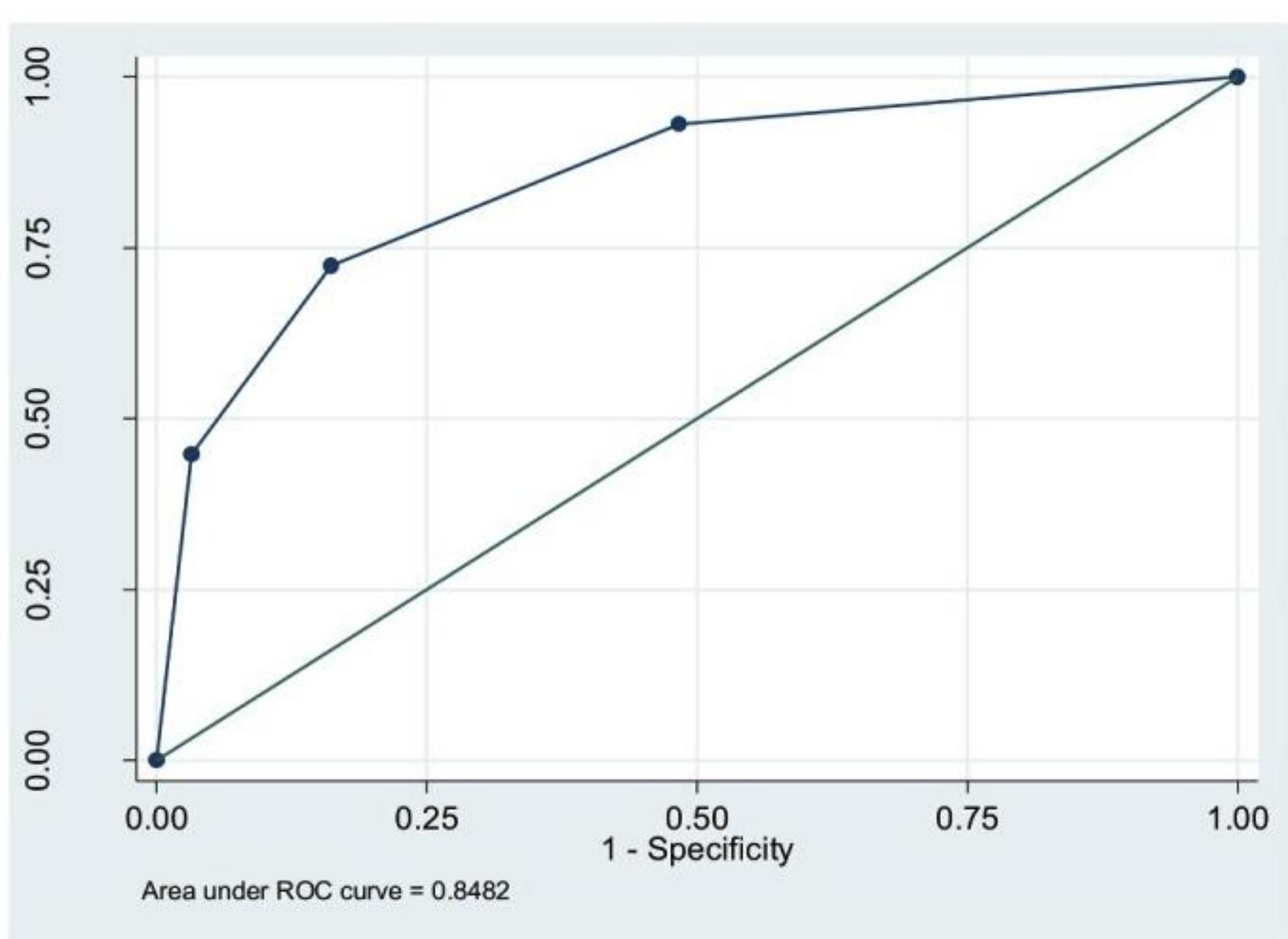
IT support systems in HT management : What is the evidence?

Difference in SBP (mm of Hg) between the DSS (both computerised and non-computerised) versus control groups



mhealth in HT: Development of DSS

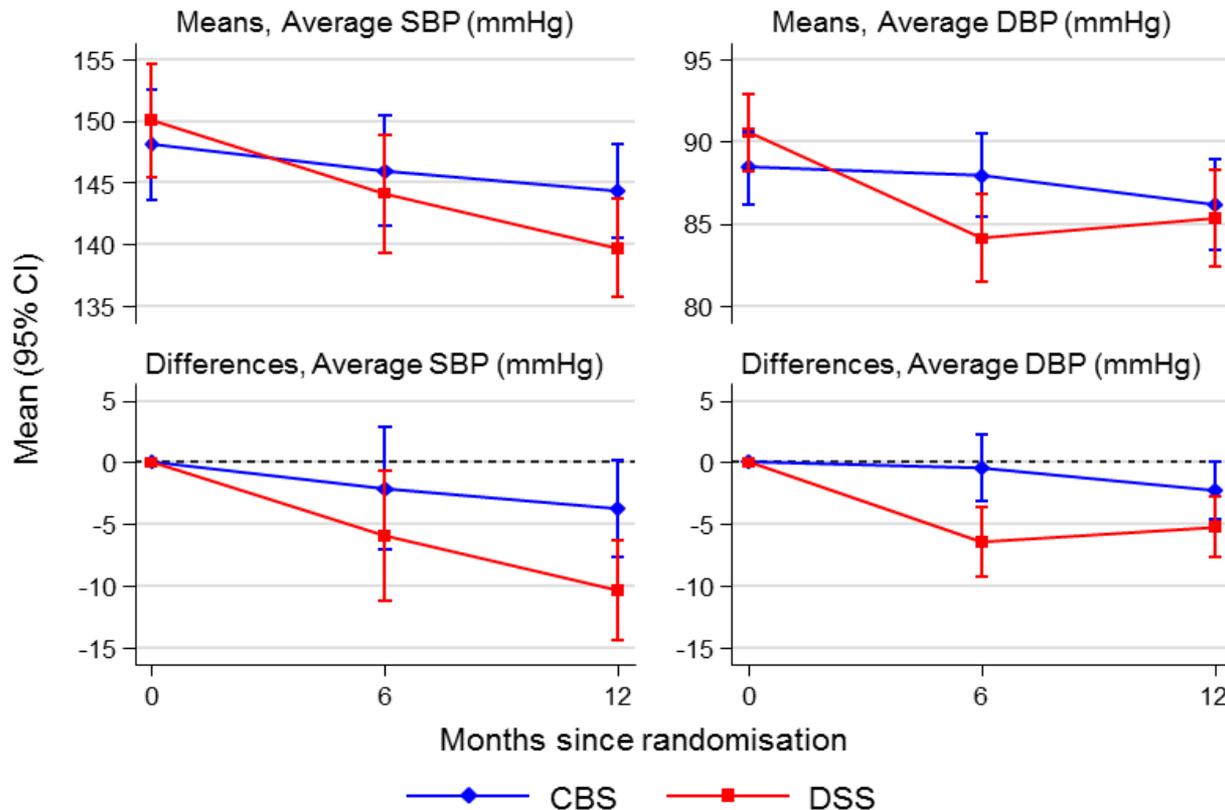




Receiver Operator Curve for comparing the DSS and independent experts on drug management.

mhealth in HT: cRCT among physicians (16 PHCs ; AP)

Mean blood pressure in randomised groups by month and differences vs. baseline



Unpublished data – not for quoting

CBS: Chart based support; DSS: Decision Support System

*Covariates included: age, gender, height, waist, body mass index, alcohol intake, pickle and papad (salty food) intake, portions of vegetable/fruit consumed per day and baseline differences in blood pressure

**Can these results be extended to
Community Health Workers?**

CHWs and Hypertension Management in India : Economic Modeling

- 3 day training program
- \$700,000 hospital cost savings / million population annually
- 700 CVD deaths / million averted
- 750 hospitalizations for stroke / MI averted
- If annual salary of CHW drops below \$3500 (200000 Rs) then the program is cost saving.



Objective

- To design a ***feasible and sustainable evidence-based, decision support-enabled, health care delivery model*** for the management of hypertension and diabetes at the primary health care facilities of Himachal Pradesh



Funded by Medtronic foundation

Unpublished data: Please do not quote

Smartphone DSS



Screen-shot

10:49

Physician certified co-morbid conditions

PVD

Myocardial Infarction

COPD/Asthma

Renal/Liver Failure (Creatinine>3mg)

Heart Block

Diabetic

100

Diastolic Blood Pressure Reading2(mm of Hg)

100

16. Height in cms:

165

17. Weight in kgs:

80

Body Mass Index(BMI)[kg/m²]:

29.4

18. FBS (Fasting Blood Sugar)

10:50

12:52

29.4

18. FBS (Fasting Blood Sugar)

19. PP (Post Prandial)

20. OHA (Oral Hypoglycemic Agent)

OHA=0

21. Insulin

No

Prev Preview

Unpublished data: Please do not quote

Screening of eligible patients at 5 CHCs (8 Months: March- October 2013)

56814 clinic attendees

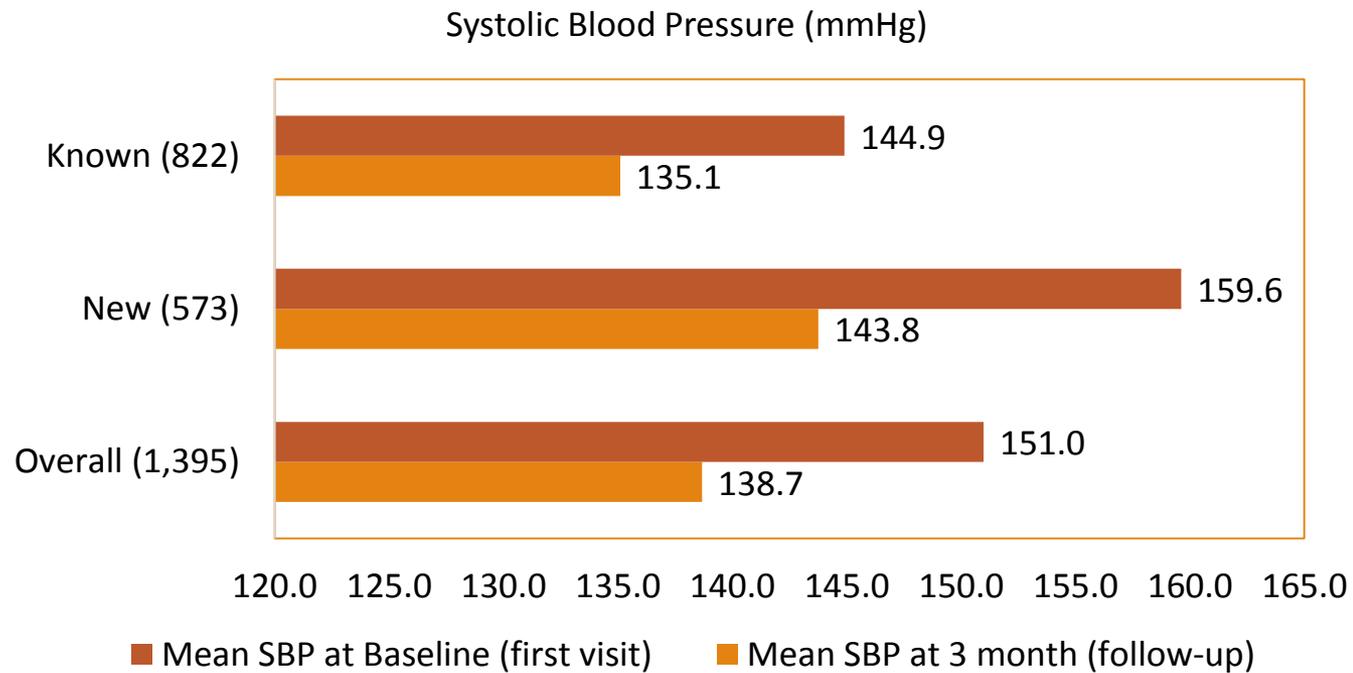


13860 eligible (>30 years)



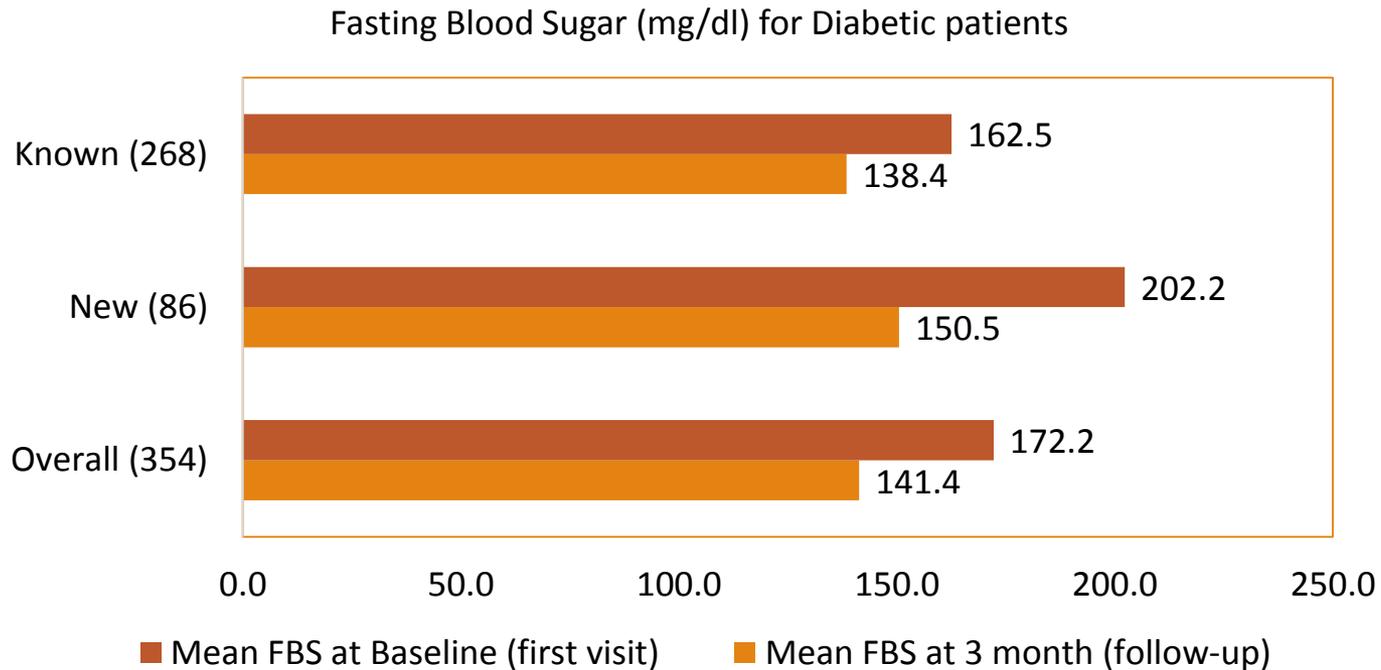
**5086 HT or DM
New HT or DM (54%)**

Change in mean SBP during first follow-up visit



Unpublished data: Please do not quote

Change in mean Fasting Blood Sugar during first follow-up visit



Unpublished data: Please do not quote

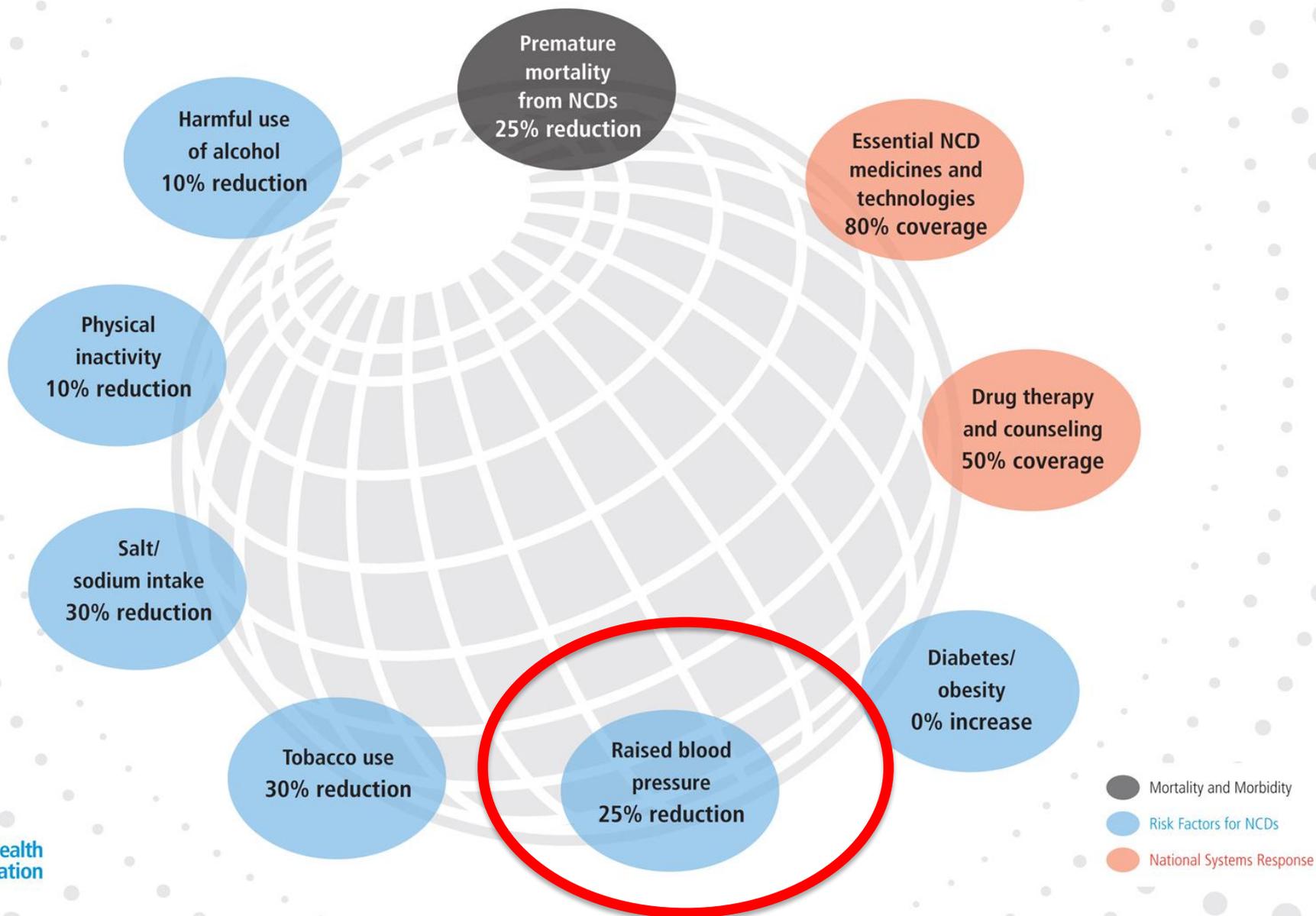
Clinical trial to reduce outcomes

A cluster randomized trial of an electronic clinical decision-support enabled nurse led intervention for reducing death, MI, stroke in patients of hypertension and diabetes in India

TRANS-DISCIPLINARY Research

“Implies conception of research questions that transcend the individual departments or specialized knowledge bases because they are intended to solve problems that are, by definition, beyond the purview of individual disciplines” —
IOM, 2003

Set of 9 voluntary global NCD targets for 2025



mWELLCARE:

An integrated mHealth system for the prevention and care of chronic conditions

Goal:

To develop and evaluate a mHealth system aimed to improve the treatment and care of patients with any chronic disease risk factor or state (hypertension, diabetes, depression, harmful alcohol use, obesity)

Specific Objectives:

- Design of m-WELLCARE: to provide evidence based decision support for physicians and primary health workers (PHWs) and for patient self-management tailored for the individual patient; and to monitor and give feedback to patients, physicians, PHWs and health service managers;
- To evaluate m-WELLCARE in two States to determine its effectiveness
- To produce a plan for ensuring scalability and sustainability of m-WELLCARE in partnership with potential users.

mWELLCARE:

Trans disciplinary team

- Epidemiologists
- Health experts in
 - Cardiovascular diseases
 - Metabolic disorders
 - Mental health
 - Tobacco cessation
- Health economists
- Health systems researchers
- Technology developers
- Business development experts
- Experts in governance

Inter-Multi-Trans disciplinary research : My personal journey

Trans disciplinary Research	Multidisciplinary Research	Interdisciplinary Research	Within Disciplinary Research
<p>Collaboration in which exchanging information, altering discipline-specific approaches, sharing resources and integrating disciplines achieves a common scientific goal (Rosenberg 1992).</p>	<p>Researchers from a variety of disciplines work together at some point during a project, but have separate questions, separate conclusions, and disseminate in different journals.</p>	<p>Researchers interact with the goal of transferring knowledge from one discipline to another. Allows researchers to inform each other's work and compare individual findings.</p>	<p>INTERHEART CREATE Registry</p>
<p>Can we integrate care for all chronic diseases : VP, DP and others</p>	<p>RA: Hypertension control in PHCS with EHR and DSS AV: Acceptability and feasibility of nurses and DSS in rural HP DP and NT: Demonstration in CHCs of HP TG and others : Economic modelling of HT care by CHW</p>	<p>VP: CHW in mental Health DP: CHW in Hypertension</p>	

Larger Question

- **Can we reduce high blood pressure burden in India by 25% in the next 12 yeras ?**

Research questions have multiple angles

- Scientific credibility
(evidence & rationale?)  Biomedical & Epidemiological research (Strength, Quality, generalizability)
- Financial feasibility
(cost effective? affordable?)  Health economics research
- Operational stability[↑]
(sustainable? scalable?)  Health systems research
- Political viability
(is the community ready & receptive?)  Social sciences research

Combining all these: A trans disciplinary approach

Conclusions

- **A research question for WHO 2025 goals is simple yet complex**
- **Multiple angles**
- **Multiple players**
- **Scaling up and sustainability plans should be embedded in the research question.**