

International Health Lecture 2015

Professor Vikram Patel FMedSci

Re-engineering personalised medicine for chronic conditions



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#ihl2015

Re-engineering personalized health care for chronic conditions: lessons from my mother

Vikram Patel

Wellcome Trust Principal Research Fellow
Professor of International Mental Health



OPINION

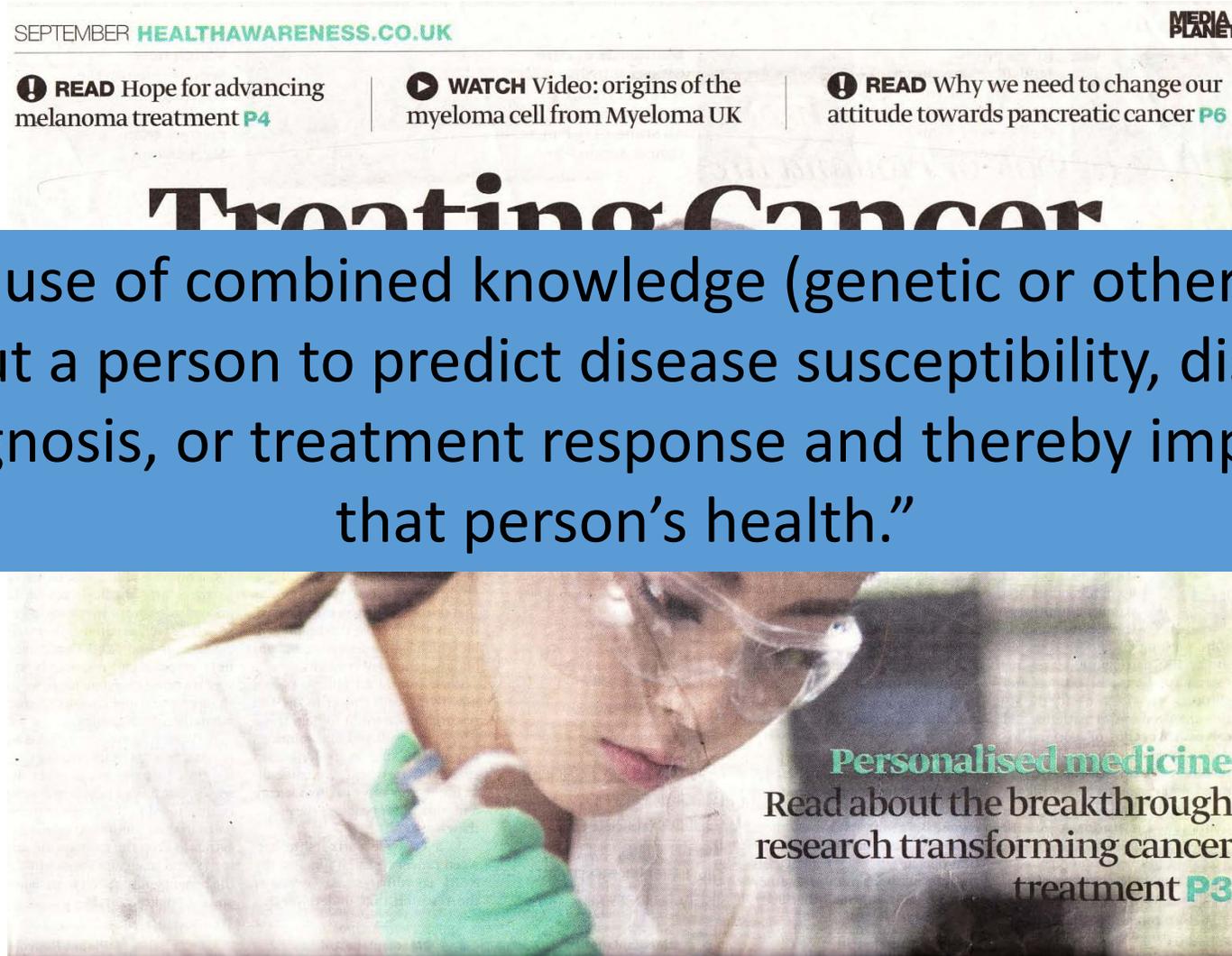
Has the revolution arrived?

Looking back over the past decade of human genomics, **Francis Collins** finds five key lessons for the future of personalized medicine — for technology, policy, partnerships and pharmacogenomics.

Perhaps the most profound consequence of the genome revolution in the long run will be the development of targeted therapeutics based on a detailed molecular understanding of pathogenesis. However, this is also the goal most challenged by long timelines, high failure rates and exorbitant costs. Despite those obstacles, inspir-



One view



“the use of combined knowledge (genetic or otherwise) about a person to predict disease susceptibility, disease prognosis, or treatment response and thereby improve that person’s health.”





BMJ 2015;350:h181 doi:10.1136/bmj.h181 (Published 10 February 2015)

Page 1 of 4



Service Delivery and Safety



YSIS

WHO global strategy on people-centred and integrated health services

Interim Report

SPOTLIGHT: P

Deliveri

Transforming
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Eaton, Sue F
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Simon
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Simon Eaton *clinical lead*¹, Sue Roberts *chair*¹, Bridget Turner *director of policy and care improvement*²

¹Year of Care Partnerships, Northumbria Healthcare NHS Foundation Trust, North Shields NE29 8NH, UK; ²Diabetes UK, London NW1 7AA, UK



The case for re-engineering

The burden of chronic conditions

The current response: my mother's story

How to re-engineer personalized health care



The burden of chronic conditions



The ‘categorization’ of human health conditions

- “Group 1”: communicable, perinatal and nutritional disorders
- “Group 2”: non-communicable disorders
- “Group 3”: injuries



'NCD' to 'chronic conditions'

Heart diseases

Diabetes

Stroke

Lung Diseases

Cancer

Chronic infectious diseases

Mental health and neurological Disorders

Injuries leading to Chronic Disabilities

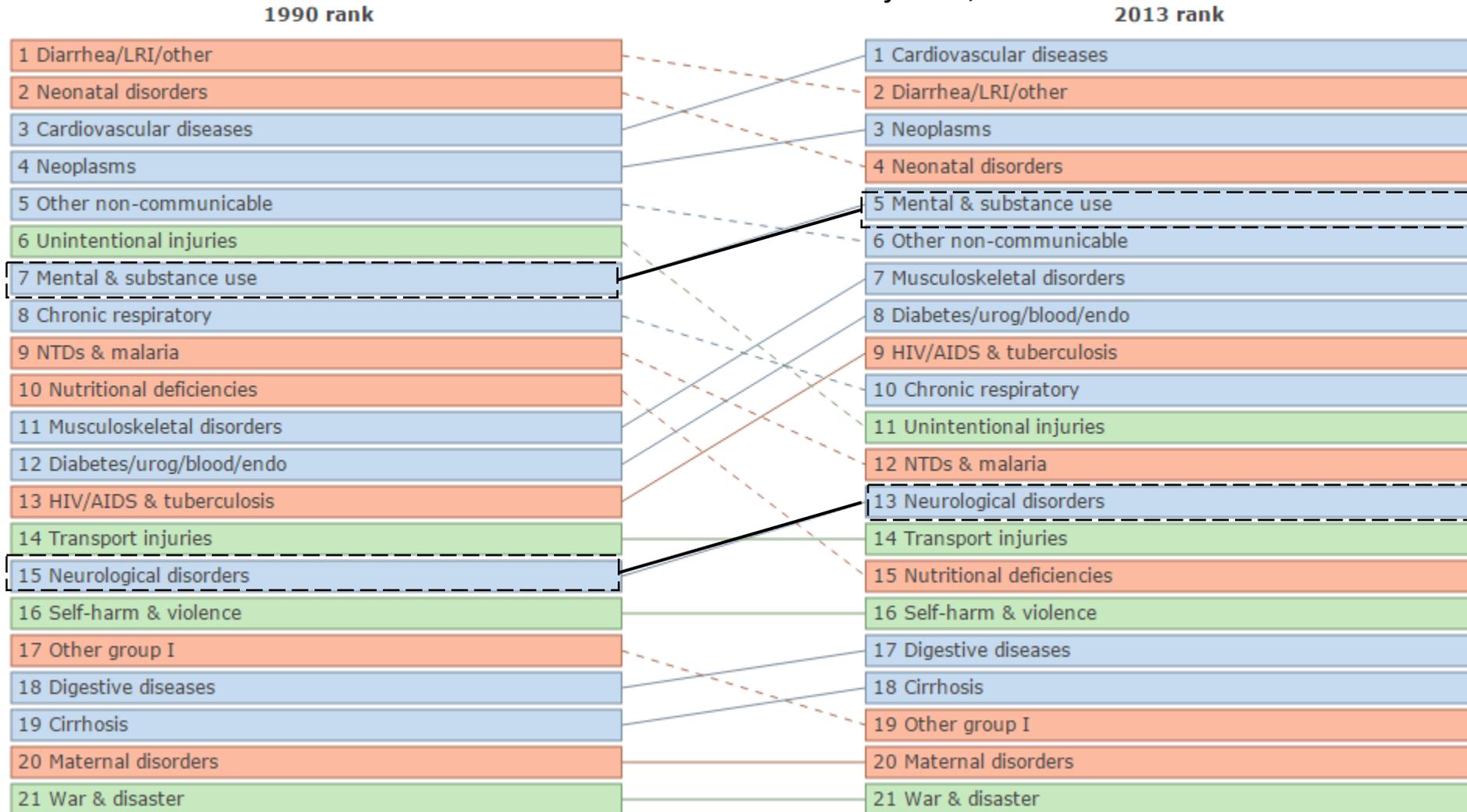
Reflecting the need for classifications to be pragmatic and relevant both to individual patients, their families and health service contexts



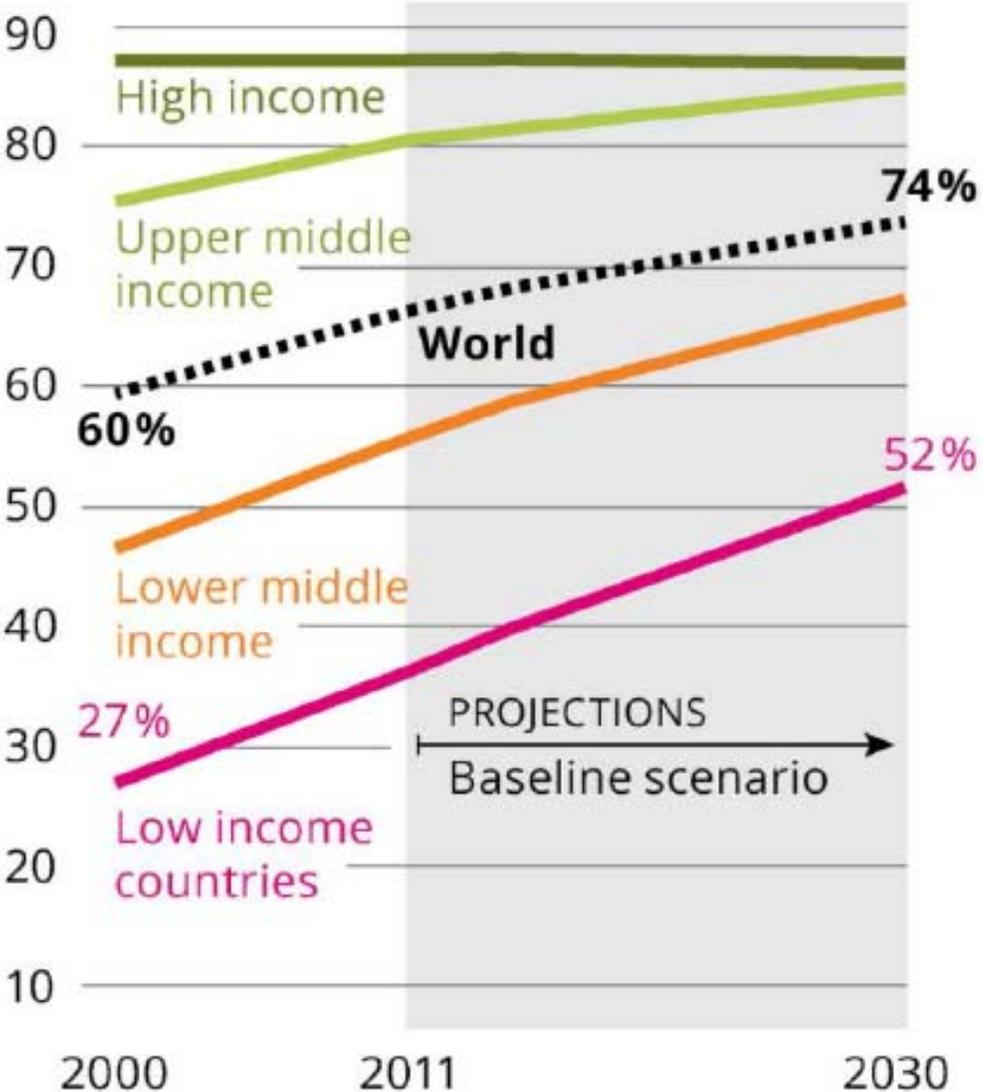
Global burden of disease

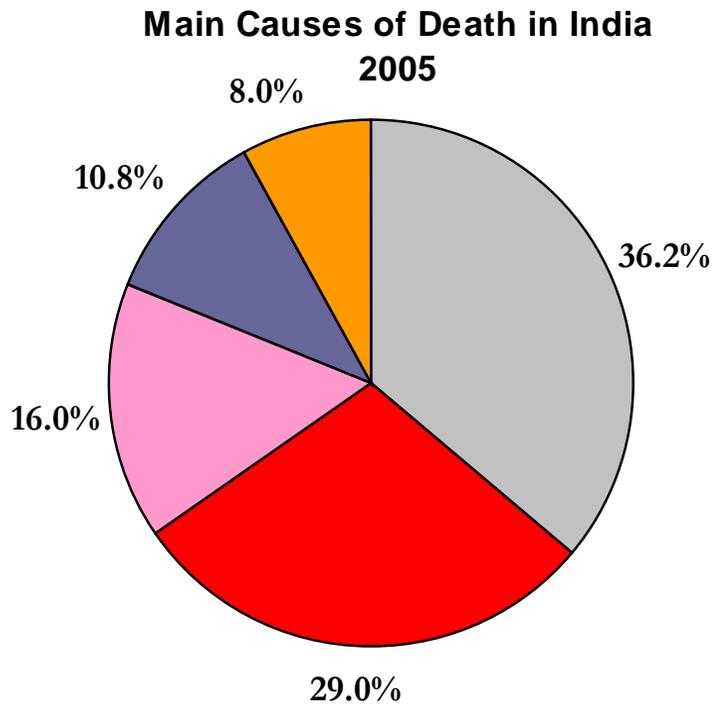
(Murray et al, 2014)

GBD 2013 estimated DALYs for 306 diseases and injuries, across 188 countries

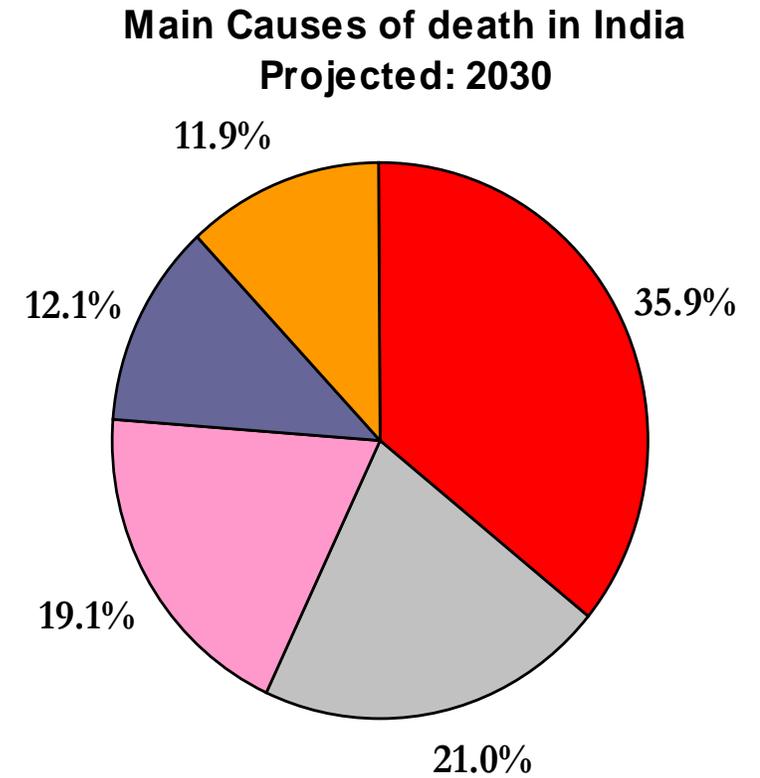


Deaths related to non-communicable diseases (in percentage of total deaths)





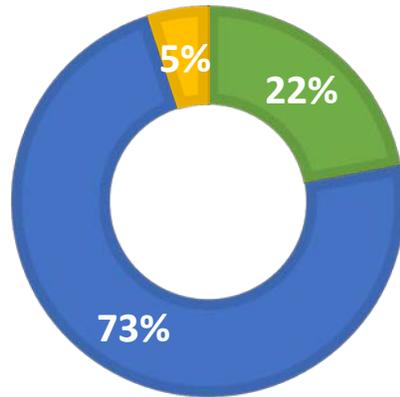
- Communicable Diseases
- Cardiovascular Diseases
- Other Chronic Diseases
- Injuries
- Cancer



Source: WHO Infobase

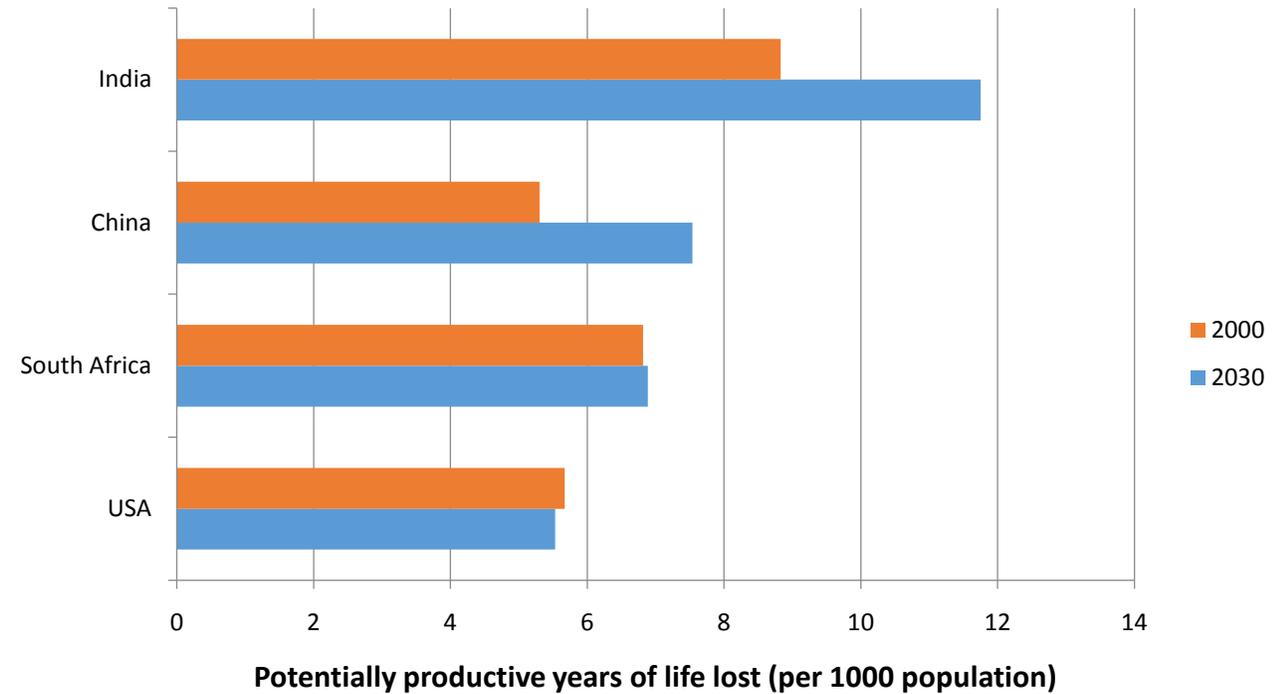


Years of Life Lived with Disability: NCD have a greater impact in India than infectious diseases



Significant loss of economically productive years of life as a result of cardiovascular diseases

Source: Race Against Time



The burden of chronic conditions

Summary

- Leading cause of death and disability in middle income countries, killing more than 5 million each year in India alone
- Afflicts younger population with enormous productive life year and economic losses
- Chronic conditions increasingly affect the poor, as much as or more than the rich



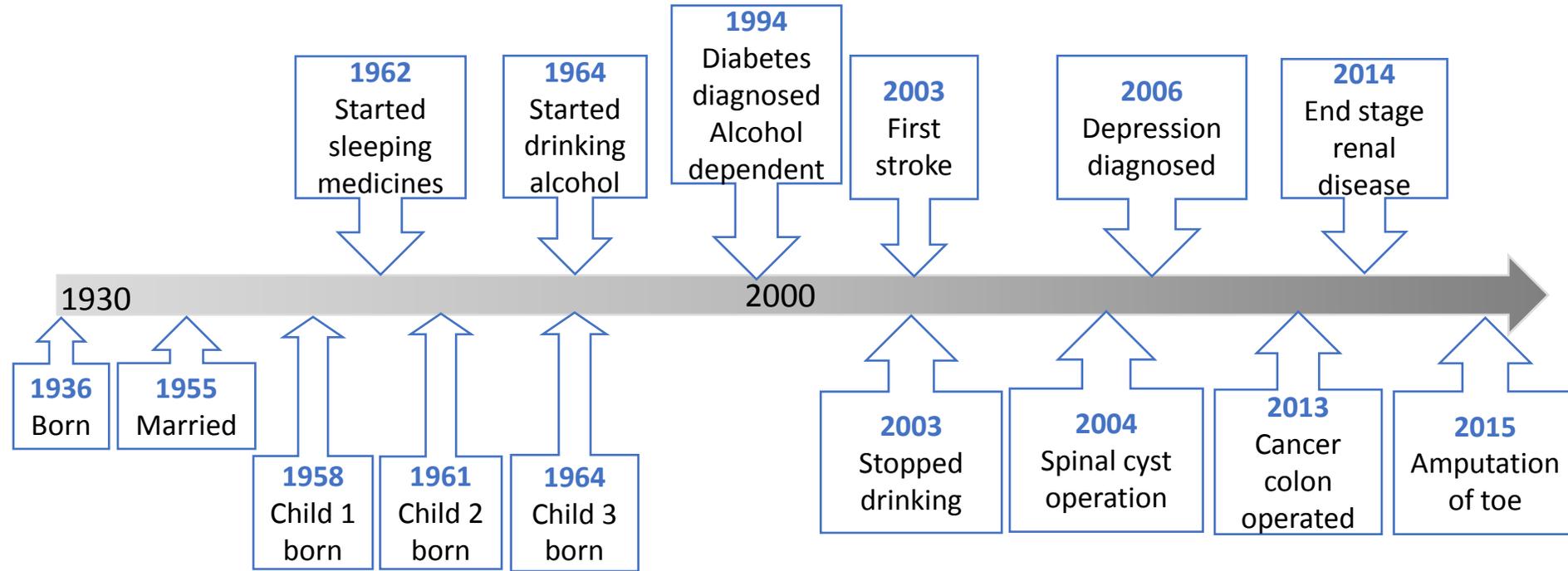
The current health system approach



Perspectives

Patel, Lancet 2015

The art of medicine
Rethinking personalised medicine



Adis

- 1) Salt restricted diabetic high potassium
- 4) Avoid nephrotoxic drugs / NSAIDs
- 3) Avoid coconut water / veg soups / fruit juices
- 4) Phlebotomy Rasmun @ 1L/day

- 5) Tab. Thyronorm (50) 1-0-0 BBR
- 6) Tab. Trajenta (5) 1-0-0
- 7) Tab. Nicerdai 10R 1-1-1
- 8) Tab. Serivid (25) 2-0-0

- 23) Tab. ceftum (250) 1-0-1
 - 24) Tab. Ultracet 500 for pain.
- 5 days

Flu + APO consult - Dr. Bichu
E/mucopl

Flu +
Cr. maint. HD daily 2 hrs.
Keep dry wt 5+kg

Hand exercises for AV fistula

She is miserable but alive!

- 12) Tab. Nifed (100) 0-0-1 (HS)
- 13) Tab. Cranpan 1-0-1
- 14) Tab. Extramune 1-0-1
- 15) Novorpid 10-0-10
- 16) Lantus star 80 HS
- 17) 2m Ewif 100 mg daily HD q 2 weekly
- 18) 2y. Transfer 10000 v 5/10 Post HD
- 19) 2y Ncurite q 2 weekly
- 20) Evlon cream LA once/wk
- 21) Nepmo HP 3500 v 1/1
- 22) Tab Pan (40) 1-0-0
- 23) ~~Tab ceftum~~

[Faint handwritten notes, possibly bleed-through from the reverse side of the page]



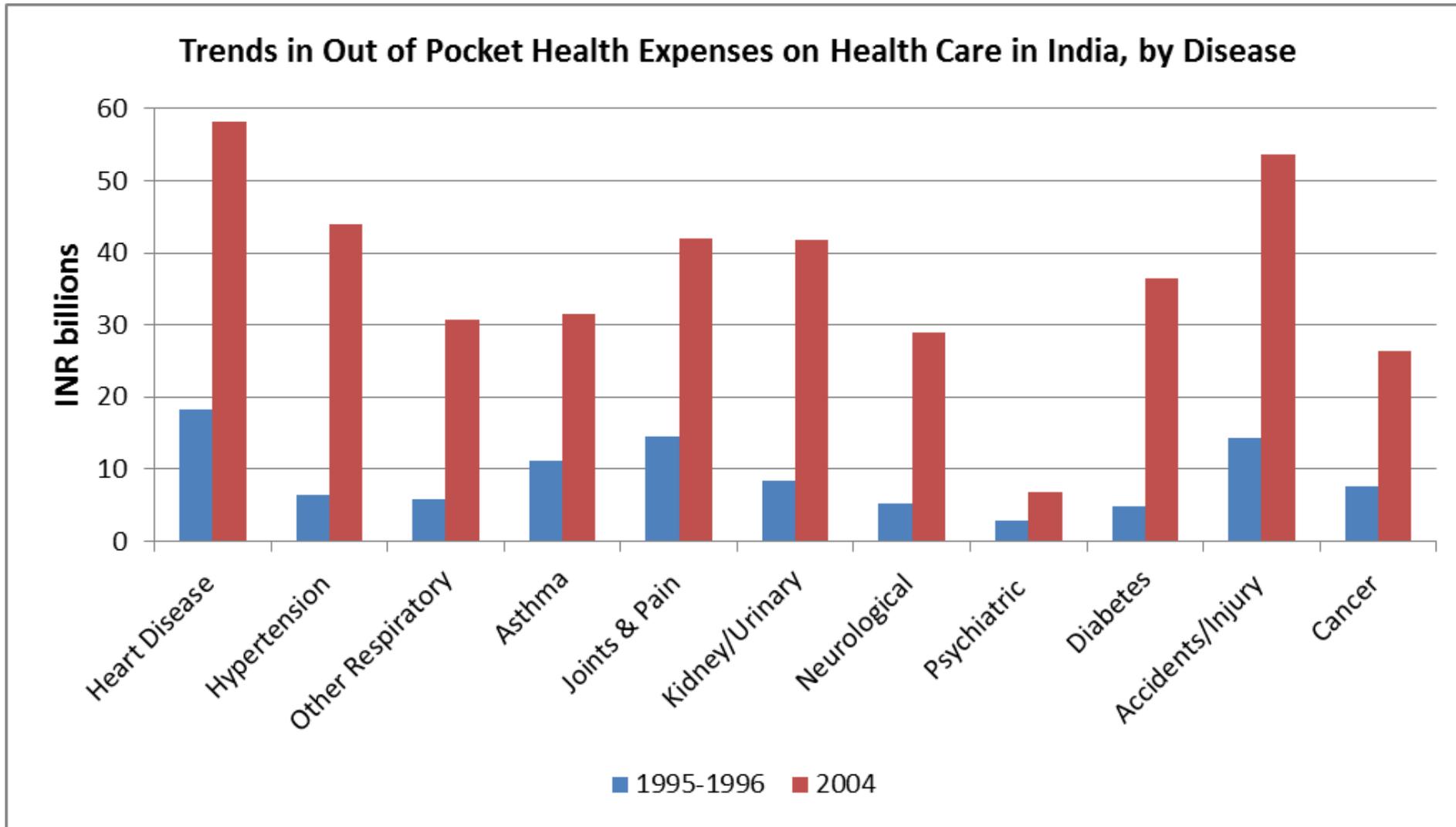
The two India's



Treatment and outcomes of acute coronary syndromes in India (CREATE): a prospective analysis of registry data

	Rich	Upper middle class	Lower middle class	Poor	p value
N	1078 (5.3%)	4590 (22.5%)	10737 (52.5%)	3999 (19.6%)	
Key investigations					
Any cardiac enzyme	988 (91.6%)	3803 (82.9%)	7816 (72.8%)	2388 (59.7%)	<0.0001
Coronary angiography	441 (40.9%)	1636 (35.6%)	2310 (21.5%)	341 (8.5%)	<0.0001
Key treatments					
Thrombolysis†	309 (60.6%)	1610 (64.5%)	4092 (62.9%)	1494 (52.3%)	<0.0001
Antiplatelet drugs	1046 (97.0%)	4481 (97.6%)	10524 (98.0%)	3917 (97.9%)	0.12
Beta blockers	634 (58.8%)	2811 (61.2%)	6656 (62.0%)	1983 (49.6%)	<0.0001
Lipid-lowering drugs	660 (61.2%)	2693 (58.7%)	5816 (54.2%)	1440 (36.0%)	<0.0001
ACE inhibitor or ARB	681 (63.2%)	2619 (57.1%)	6131 (57.1%)	2162 (54.1%)	<0.0001
Anticoagulants	964 (89.4%)	3854 (84.0%)	8821 (82.2%)	3007 (75.2%)	<0.0001
Percutaneous coronary intervention‡	165 (15.3%)	594 (13.0%)	691 (6.4%)	80 (2.0%)	<0.0001
Coronary artery bypass graft surgery‡	81 (7.5%)	226 (4.9%)	257 (2.4%)	27 (0.7%)	<0.0001



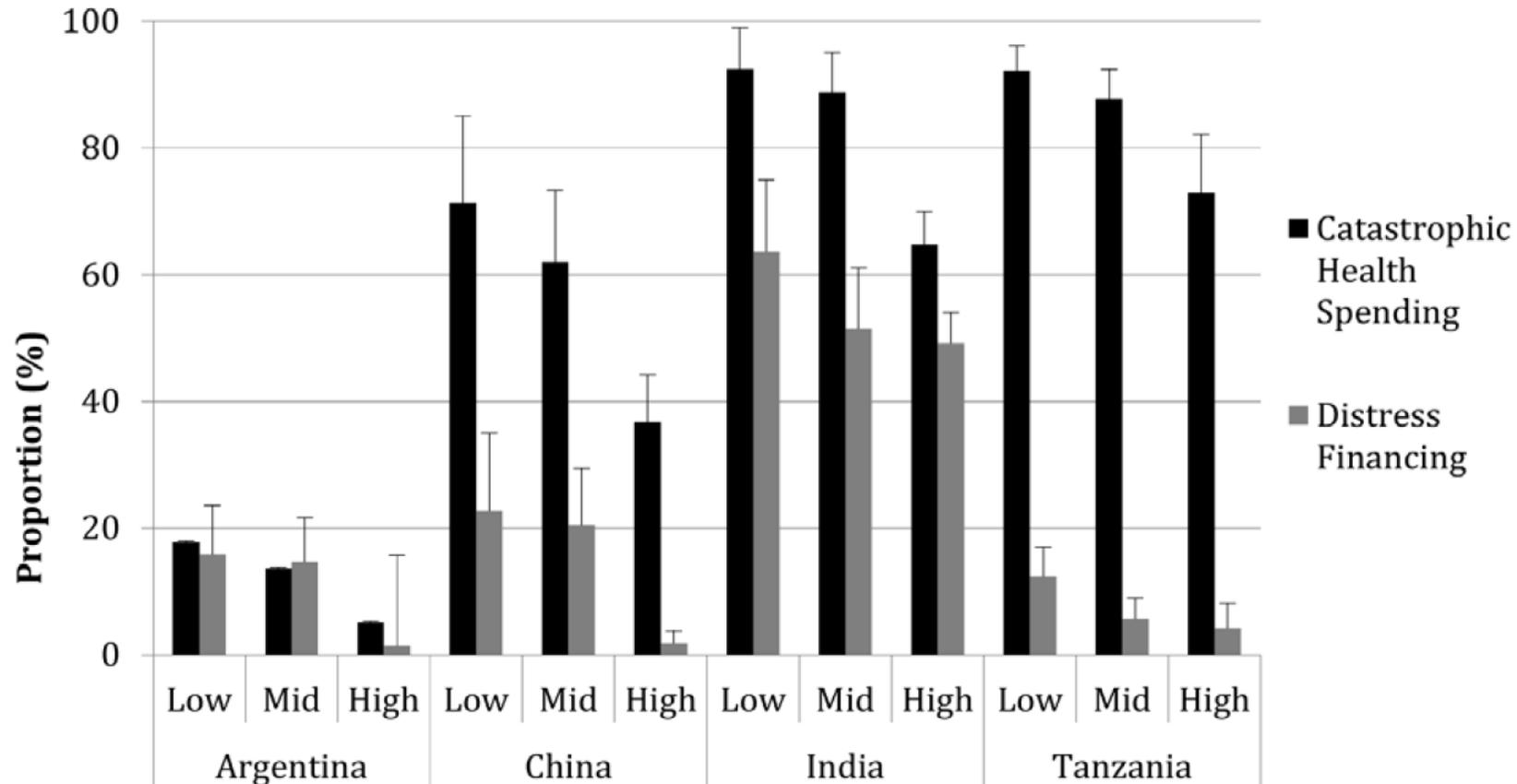


Mahal et al, World Bank 2010



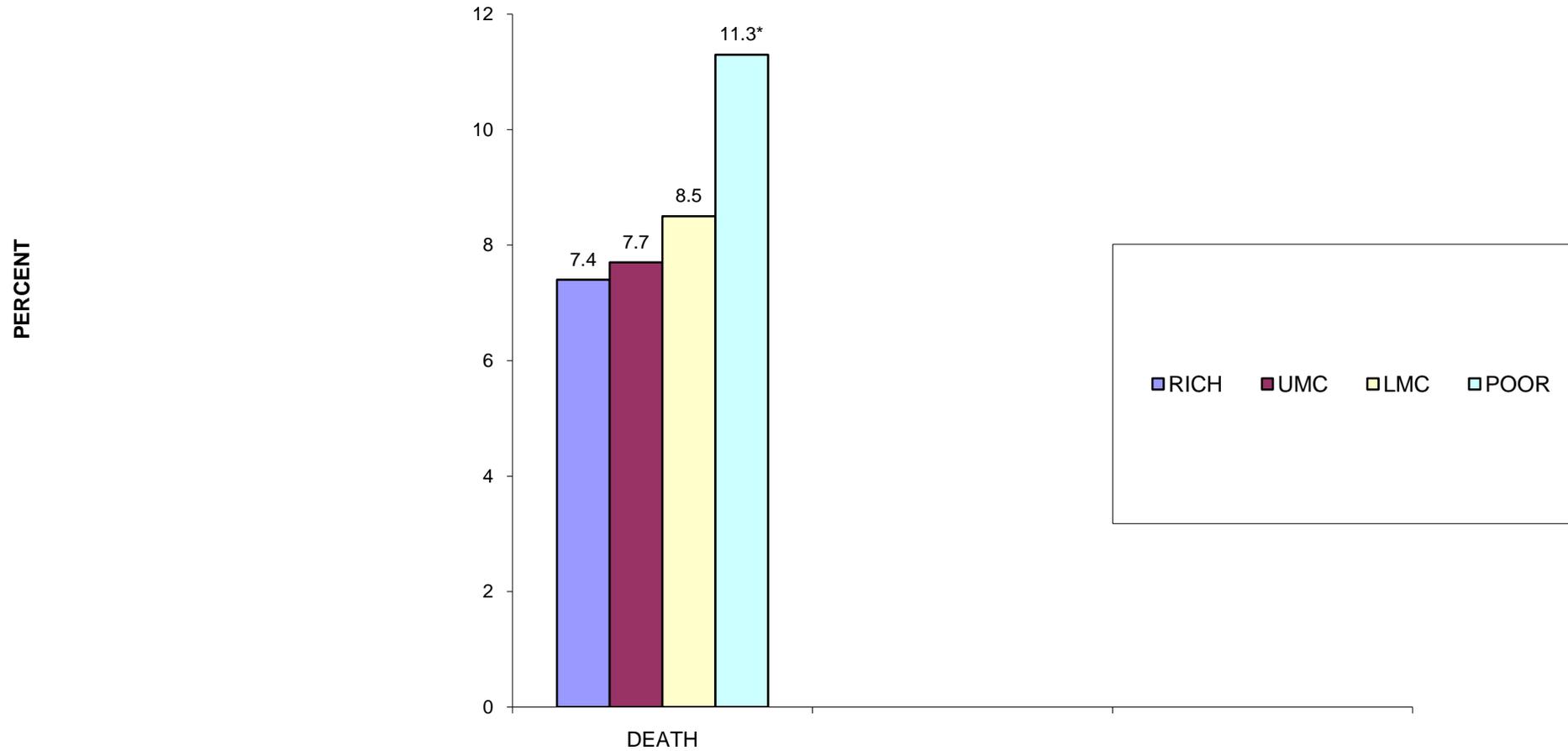
The economic impact by income groups of hospitalization for CVD

(Huffman et al, PLoS One 2011)



DEATH RATES AT 30 DAYS BY SES

(Xavier et al, 2008)



The personalized approach

Delivery of care for people with chronic conditions or associated risk factors which focuses **on integration in primary care** and **addressing multiple morbidities concurrently**



Alma-Ata: Rebirth and Revision 3

Improving the prevention and management of chronic disease in low-income and middle-income countries: a priority for primary health care

Robert Beaglehole, JoAnne Epping-Jordan, Vikram Patel, Mickey Chopra, Shah Ebrahim, Michael Kidd, Andy Haines

OPEN ACCESS Freely available online

PLOS MEDICINE

Policy Forum

Grand Challenges: Integrating Mental Health Services into Priority Health Care Platforms

Vikram Patel^{1,2,3*}, Gary S. Belkin^{4,5}, Arun Chockalingam⁶, Janice Cooper^{7,8}, Shekhar Saxena⁹, Jürgen Unützer¹⁰

1 Centre for Global Mental Health, London School of Hygiene & Tropical Medicine, United Kingdom, **2** Sangath, Goa, India, **3** Centre for Mental Health, Public Health Foundation of India, India, **4** Program in Global Mental Health, New York University School of Medicine, New York, United States of America, **5** New York City Health and Hospitals Corporation, New York, United States of America, **6** Simon Fraser University, Burnaby, Canada, **7** The Carter Center Mental Health Liberia Program, Rollins School of Public Health, Emory University, United States of America, **8** College of Science & Technology, University of Liberia, Monrovia, Liberia, **9** Department of Mental Health and Substance Abuse, World Health Organization, Switzerland, **10** Division of Integrated Care and Public Health, Psychiatry and Behavioral Sciences, University of Washington, Seattle, United States of America



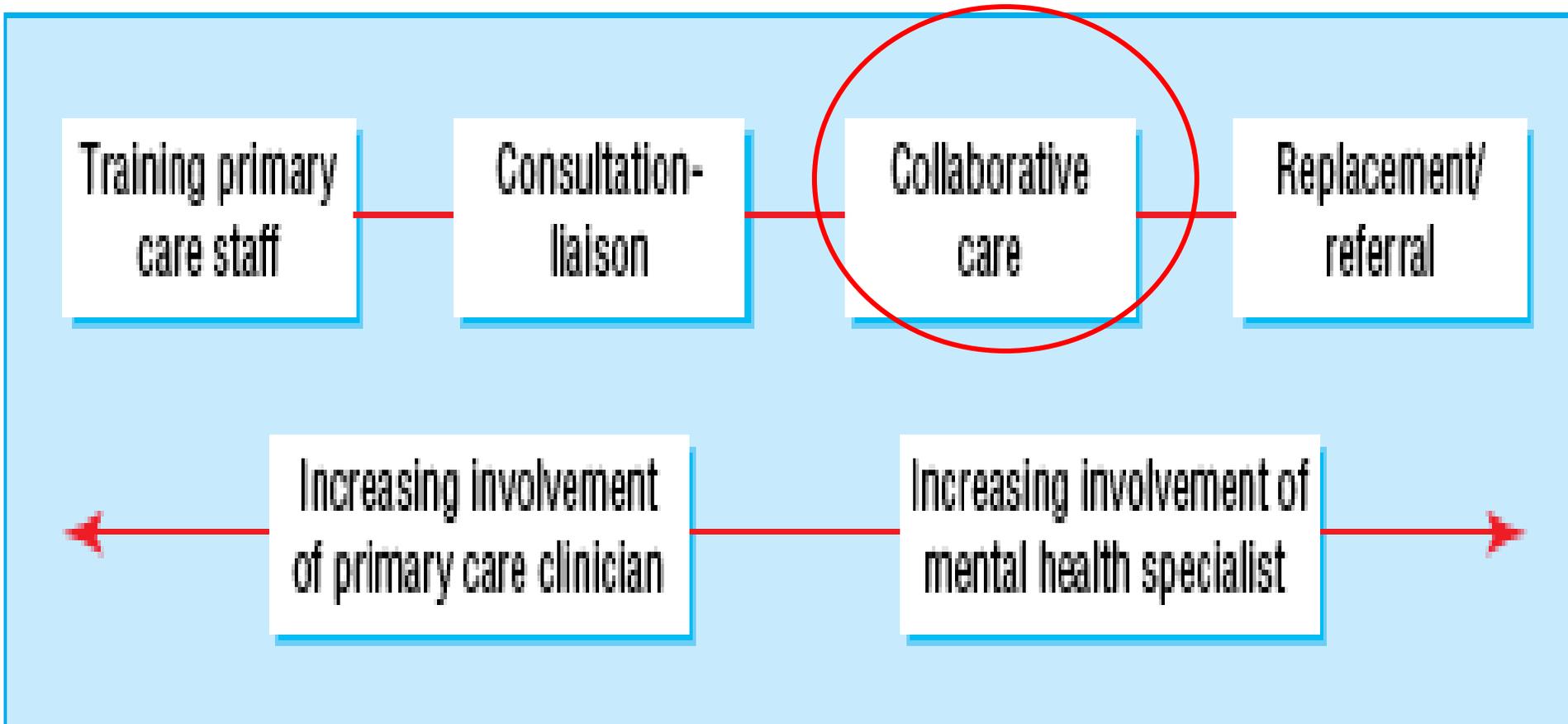
Barriers to integration in primary care

Weak human resource capacity and development

Health care system focused on 'acute' care



Addressing barriers to integration

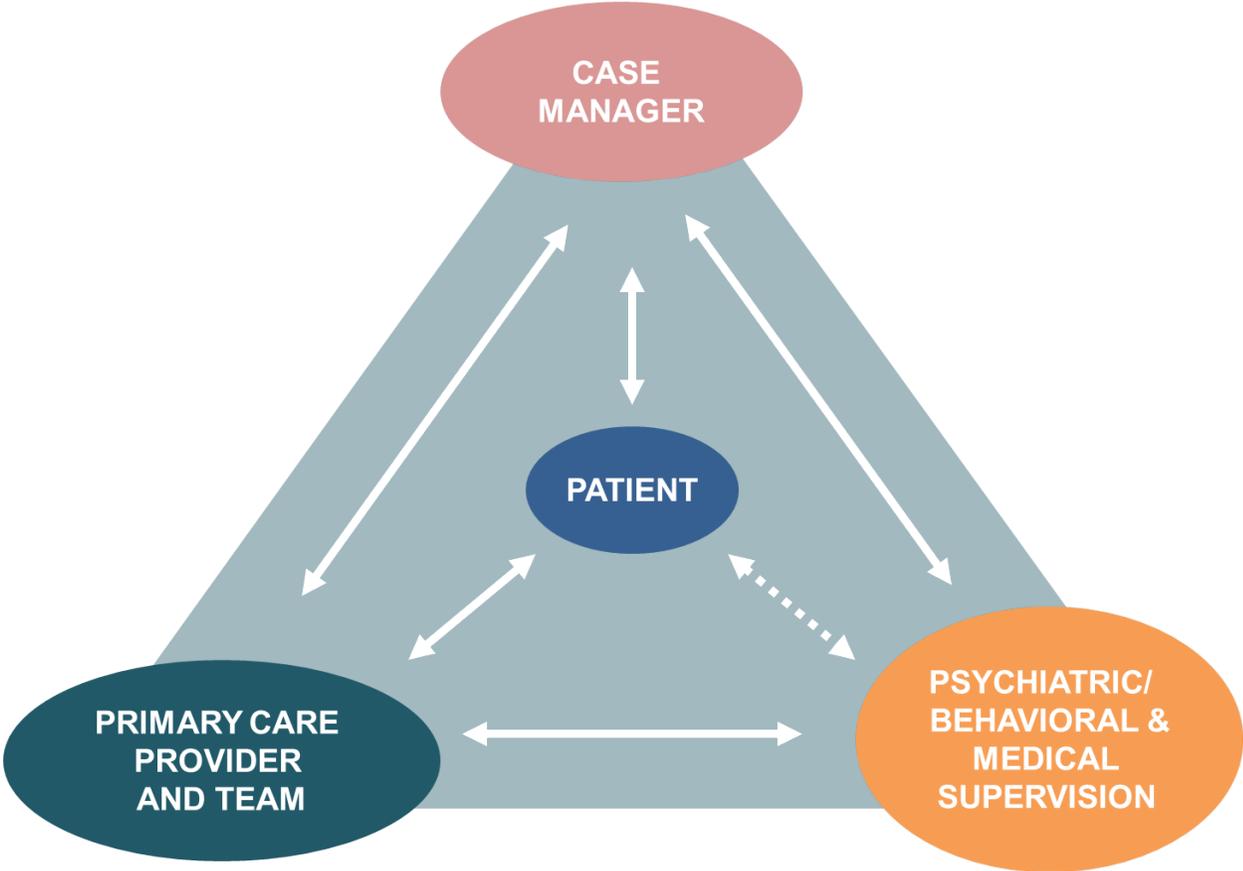


Collaborative care

(Patel et al, PLoS Med 2014)

- Proactive or opportunistic detection
- Complex interventions combining pharmacological and psychosocial treatments delivered in a tailored, stepped care manner
- Long-term monitoring and adherence support
- Active participation of patient in self-management
- Concern with clinical and social outcomes (consistent with the 'recovery' movement in mental health)





The TEAMcare model



Does it work?

- >70 RCTs for mental disorders alone demonstrating effectiveness of model for integration of mental health care in primary care
- Until recently, all RCTs in high income countries, where the role of the case manager was played by health care professionals such as nurses or social workers



The MANAS trial

(Patel et al, Lancet 2010; Br J Psych 2011; Bull WHO 2012, Soc Sci Med 2012)

To evaluate the effectiveness of a lay health worker led Collaborative Stepped Care intervention for the treatment of depressive and anxiety disorders in primary care in India

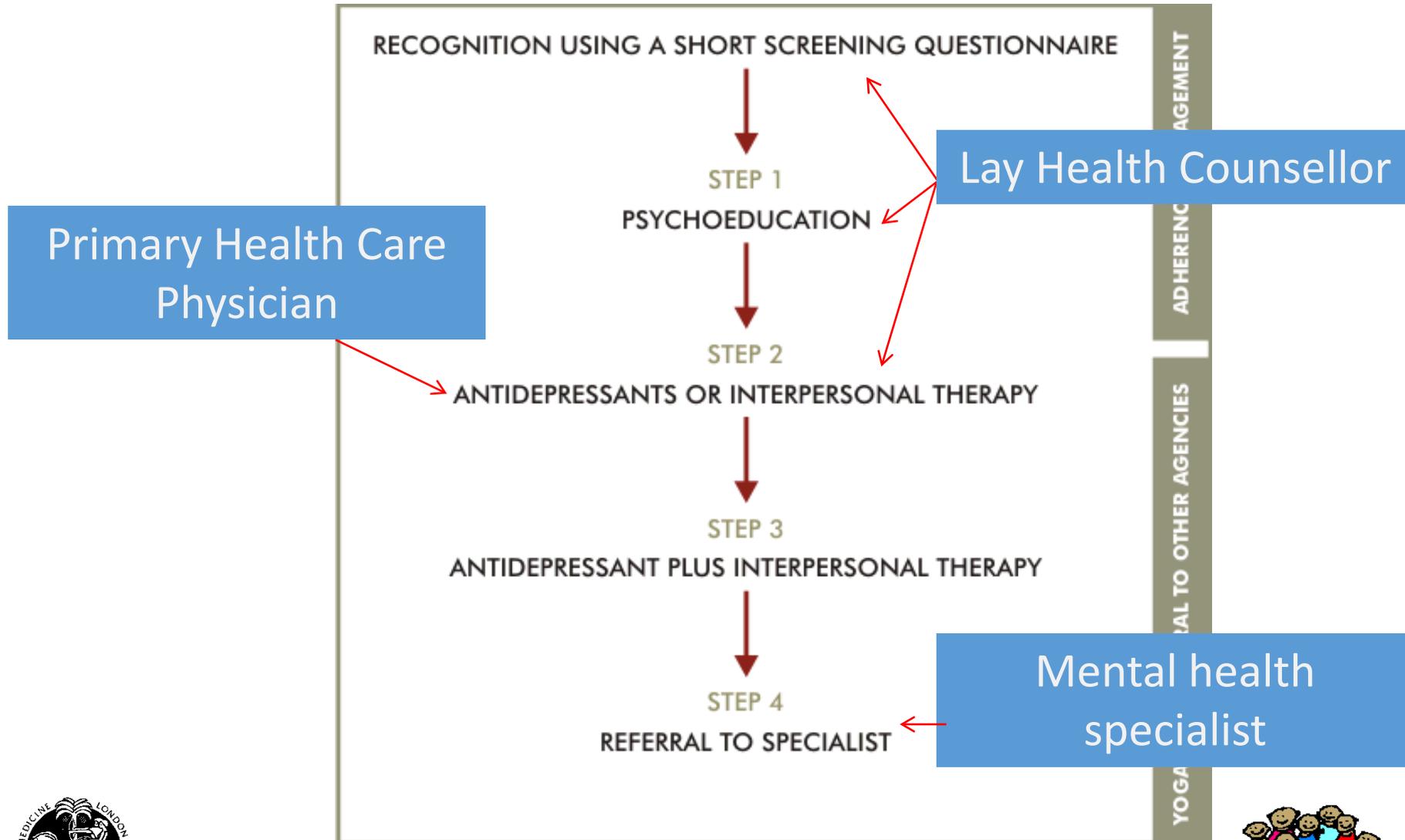


Study design

- Effectiveness trial in real world setting comparing two models of services in primary care
 - Enhanced Usual Care (EC)
 - Collaborative Stepped Care (CSC)
- Cluster randomised trial in primary care facilities in Goa, India



Collaborative Stepped Care Intervention





In the clinics





Impact of intervention over 12 months in PHC attenders

30% decrease in the prevalence of disorder
(RR=0.70, 95%CI 0.53, 0.92)

36% reduction in suicide attempts/plans
(RR=0.64, 95%CI 0.42, 0.98)

5-6 fewer days of disability in the past month



The economics

(Buttrock et al, Bull WHO 2012)

- Economic analyses show that the intervention is associated with reduced health care costs in both settings
- Thus, in PHCs, the intervention is **DOMINANT** in economic terms (more effective and cost-saving)



The human experience

Experiences of people with
schizophrenia,
their family members and the
collaborative team in a trial of
community based care in India

(Chatterji et al, Lancet 2014)



OXFORD

global mental health trials



edited by GRAHAM THORNICROFT & VIKRAM PATEL



The roles of the case manager

- Education and information to the patient and family
- Family support, include home-based care
- Adherence support
- Befriending
- Detecting early relapse and appropriate referral
- Promoting healthy behaviours/lifestyles
- Psychological treatments



Addressing multiple morbidities



The prevalence (WHO-SAGE studies of 42000+ adults in six LMIC)

	Any morbidity % (95% CI)	Multi-morbidity % (95% CI)	1+ ADL % (95% CI)	Depression % (95%CI)
India	51.6 (50-53)	22.0 (21-24)	26.2 (25-28)	11.6 (10-13)
China	55.0 (53-57)	20.3 (19-22)	5.6 (5-6)	1.6 (1-2)
Ghana	62.1 (59-65)	22.0 (19-25)	16.7 (15-19)	5.2 (4-7)
Mexico	52.7 (45-60)	22.1 (18-26)	19.0 (15-24)	9.3 (7-13)
Russia	59.7 (52-67)	34.7 (27-43)	11.6 (9-14)	4.9 (4-7)
South Africa	69.4 (62-76)	22.5 (18-27)	19.4 (15-25)	5.0 (3-10)

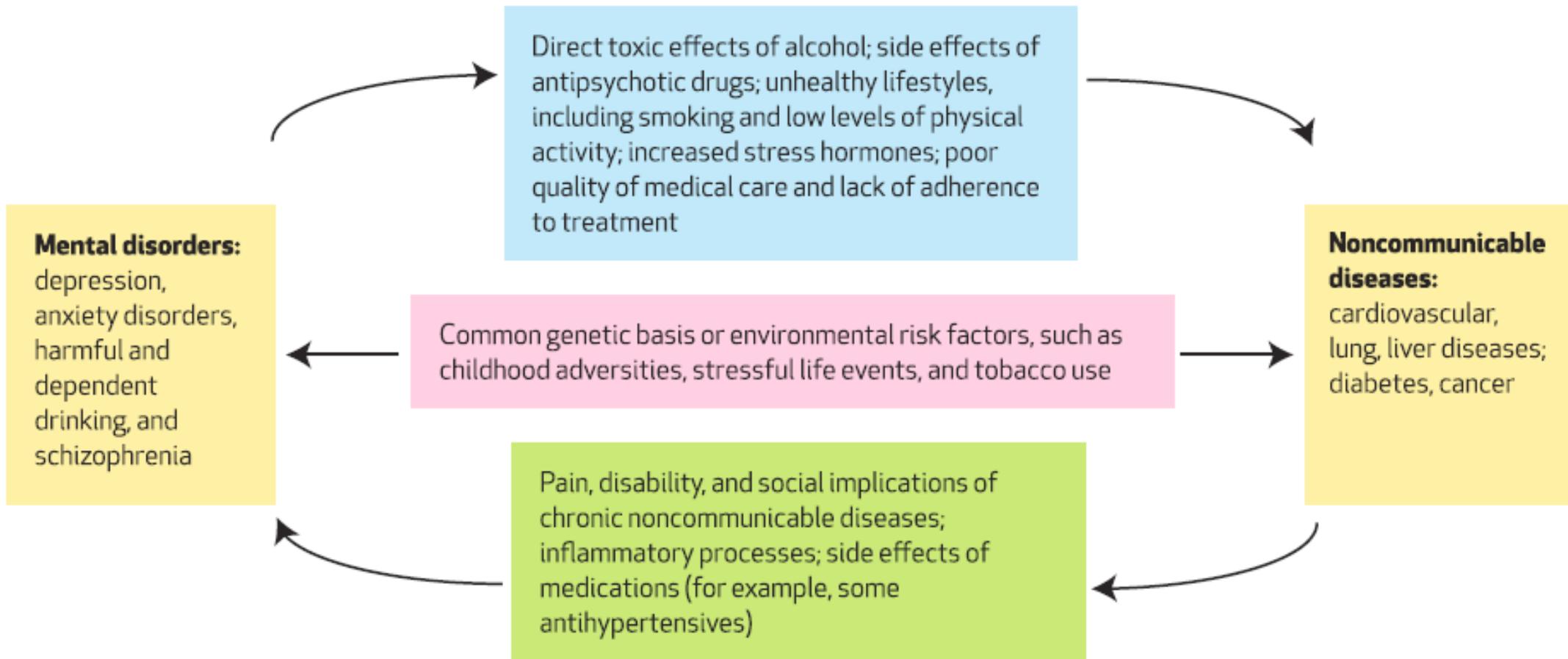
Ariokiasamy et al, BMC Med 2015

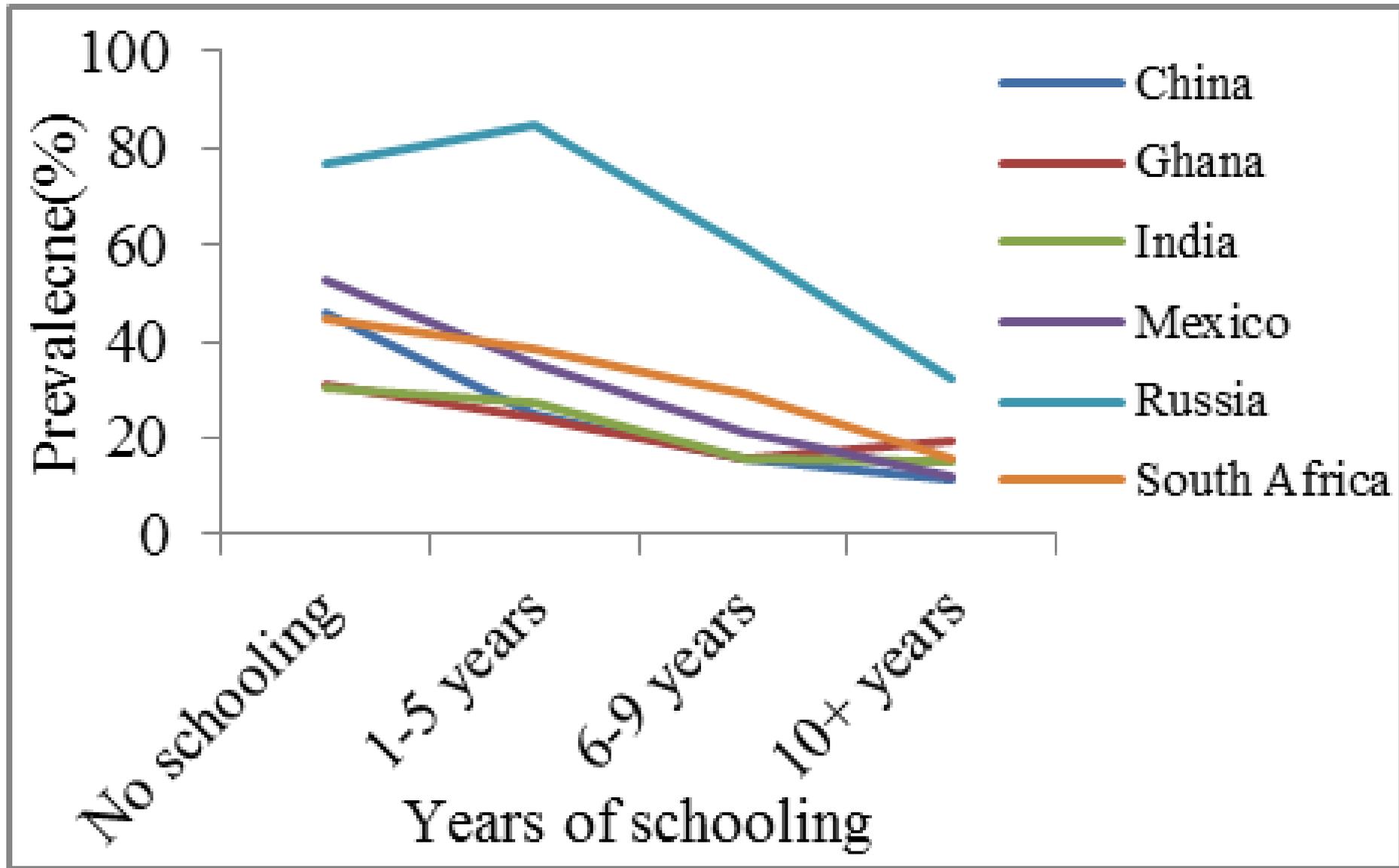


The mechanisms

(Patel & Chatterji, Health Aff 2015)

The Mechanisms Of Comorbidity Of Mental Disorders With Other Noncommunicable Diseases





The impact

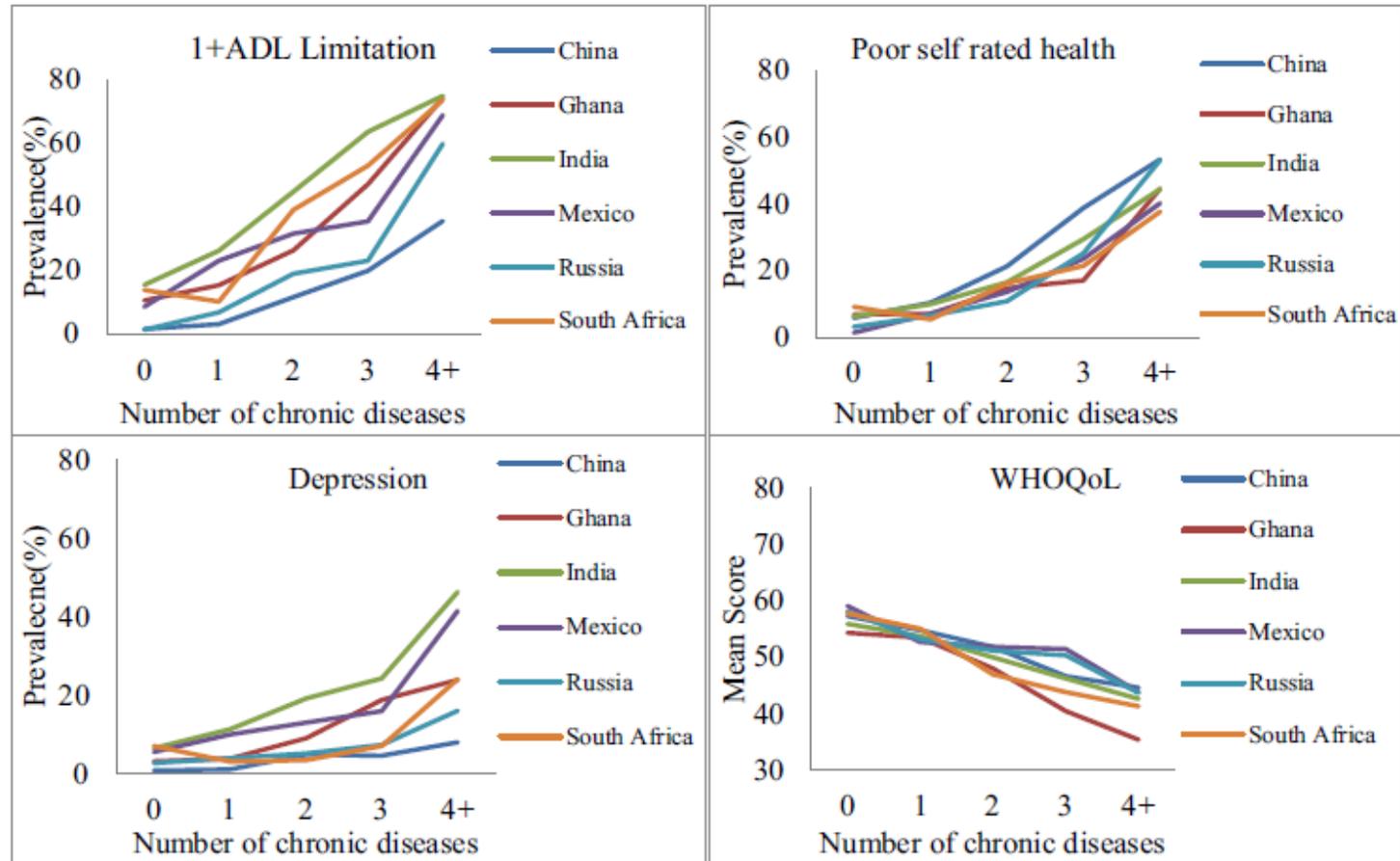


Fig. 2 Prevalence of 1+ ADL limitations, poor self-rated health, and depression and mean quality of life scores, by count of diseases and country, WHO SAGE Wave 1 (2007/10)

Integrating care for multiple chronic conditions through primary care

RESEARCH

 OPEN ACCESS



Integrated primary care for patients with mental and physical multimorbidity: cluster randomised controlled trial of collaborative care for patients with depression comorbid with diabetes or cardiovascular disease

Peter Coventry,¹ Karina Lovell,² Chris Dickens,³ Peter Bower,⁴ Carolyn Chew-Graham,⁵ Damien McElvenny,¹ Mark Hann,⁶ Andrea Cherrington,⁷ Charlotte Garrett,⁸ Chris J Gibbons,⁹ Clare Baguley,¹⁰ Kate Roughley,¹¹ Isabel Adeyemi,¹ David Reeves,⁴ Waquas Waheed,¹² Linda Gask⁸

The NEW ENGLAND JOURNAL *of* MEDICINE

ORIGINAL ARTICLE

Collaborative Care for Patients with Depression and Chronic Illnesses

Wayne J. Katon, M.D., Elizabeth H.B. Lin, M.D., M.P.H., Michael Von Korff, Sc.D., Paul Ciechanowski, M.D., M.P.H., Evette J. Ludman, Ph.D., Bessie Young, M.D., M.P.H., Do Peterson, M.S., Carolyn M. Rutter, Ph.D., Mary McGregor, M.S.N., and David McCulloch, M.D.



Knowledge generation in LMIC



INtegrating DEPrEssioN and Diabetes treatmENT (INDEPENDENT**) Study**

ClinicalTrials.gov NCT02022111

Madras Diabetes Research Foundation, Chennai, India

Emory University, Atlanta, USA

University of Washington, Seattle, USA



The PRIME PC-101 trials, South Africa

Counselling Training Manual for Depression

The lay counsellor's guide
to running depression
GROUPS

2014
PRIME/COBALT
edition

1 2 3 4 5

primecare
for
africa

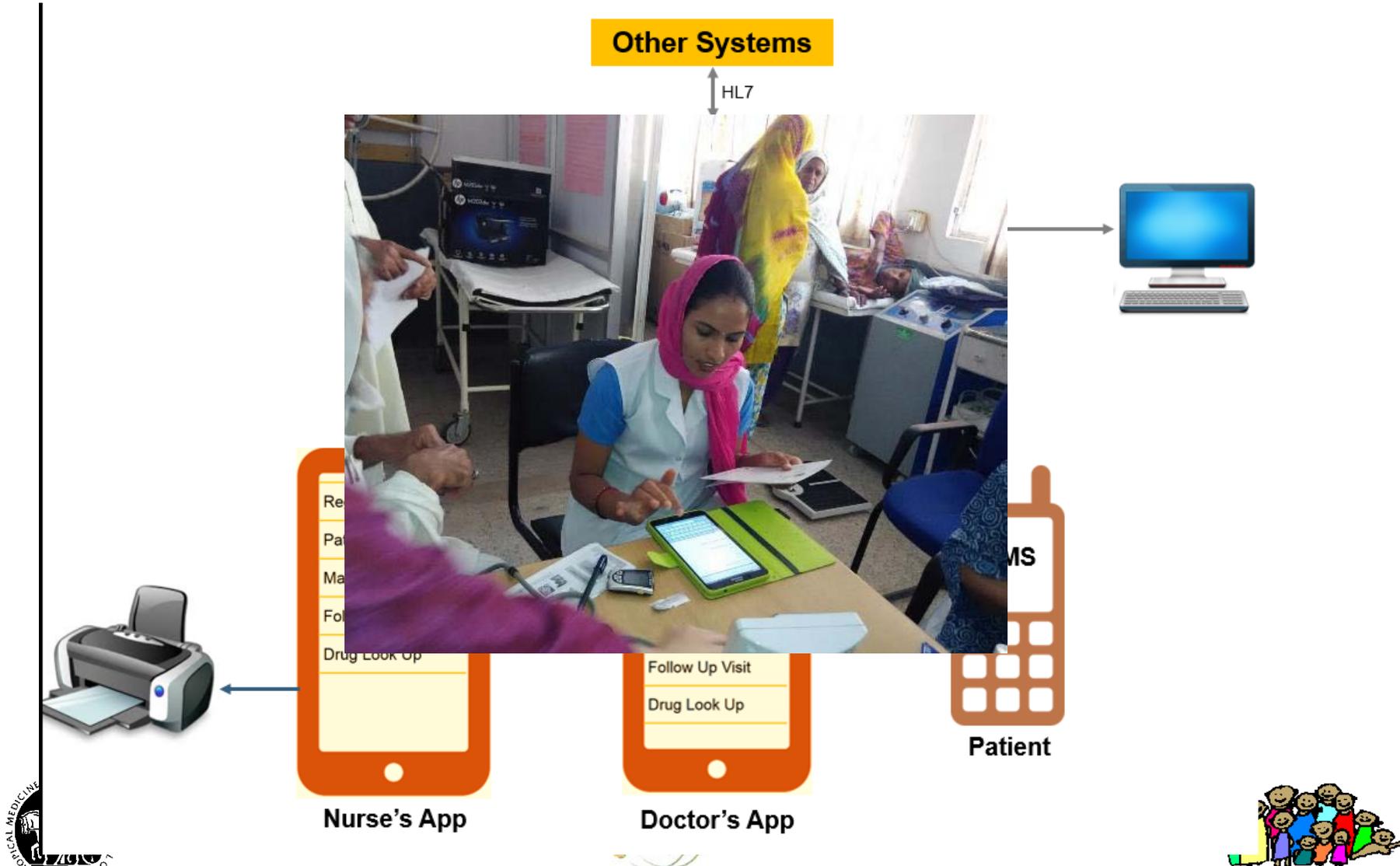
Name

CobALT

PRIME



THE MWELLCARE trial, India



Beyond individuals



Photo Farai Divan Patel

© 2014



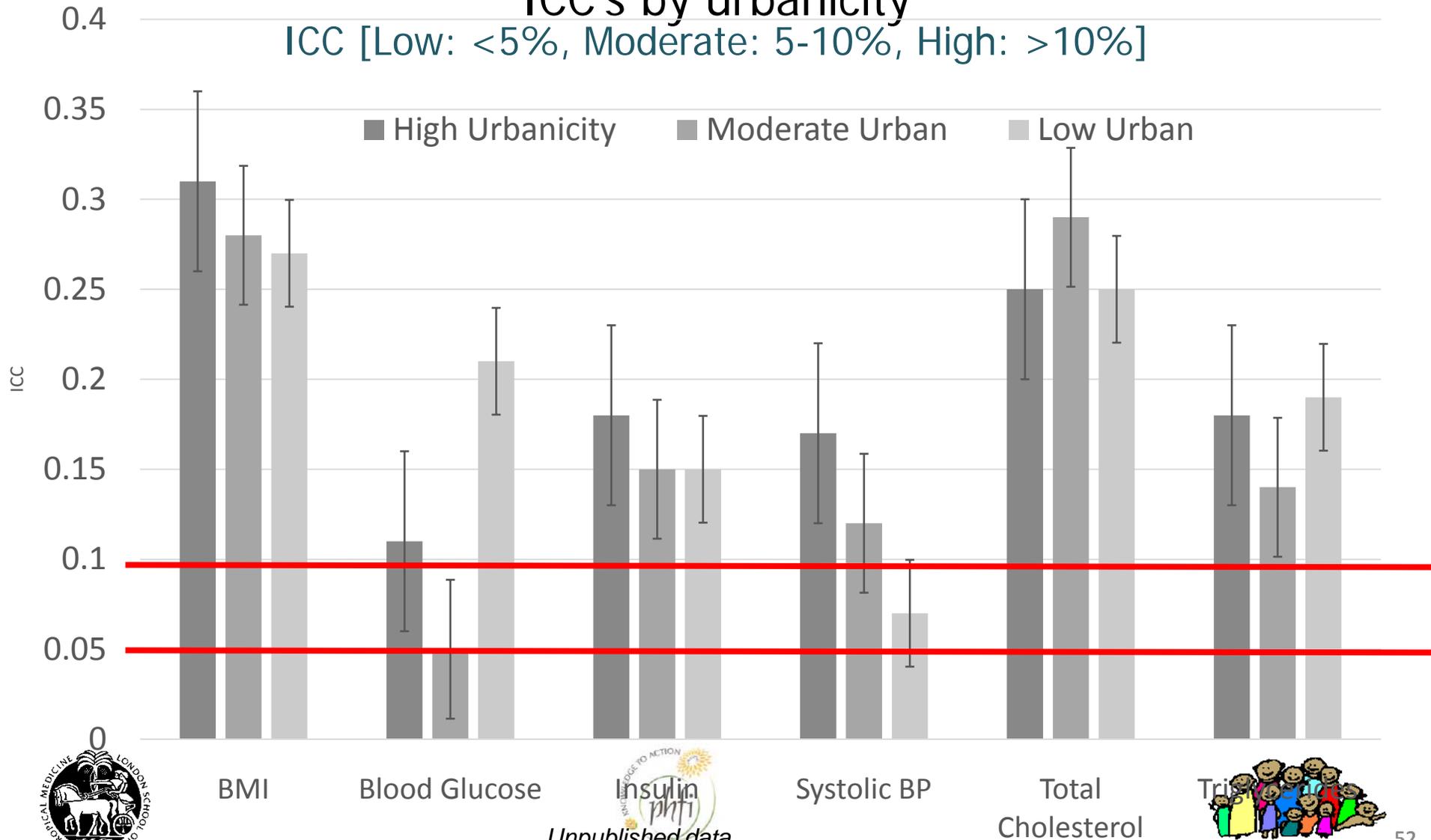


Andhra Pradesh Children and Parents Study

Birth cohort of children and families, N=5,581, 18+yrs

ICC's by urbanicity

ICC [Low: <5%, Moderate: 5-10%, High: >10%]



Clustering *across* disorders

- Center for Cardio-metabolic Risk Reduction in South Asia Study, 2010-2011
- 13890 individuals aged 20+ years in 6934 households in 2010/11 in Chennai, New Delhi, Karachi
 - (Nair et al., 2012, BMC Public Health 2012)
- Risk of a chronic condition or risk factor in another family member: OR 1.8 (1.6-2.04)



Mechanism?

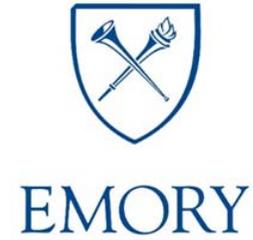
Genetic

Shared environment

Inter-personal/behavioural



The 4C Centre for Control of Chronic Conditions



LONDON
SCHOOL of
HYGIENE
& TROPICAL
MEDICINE





A trans-disciplinary approach to addressing chronic conditions

Across disorders: CVD, diabetes, cancer, mental health, injuries

Biology and Social Sciences

Clinical sciences and public health



The re-engineering continuum

Treatment of specific diseases by specialists in hospitals

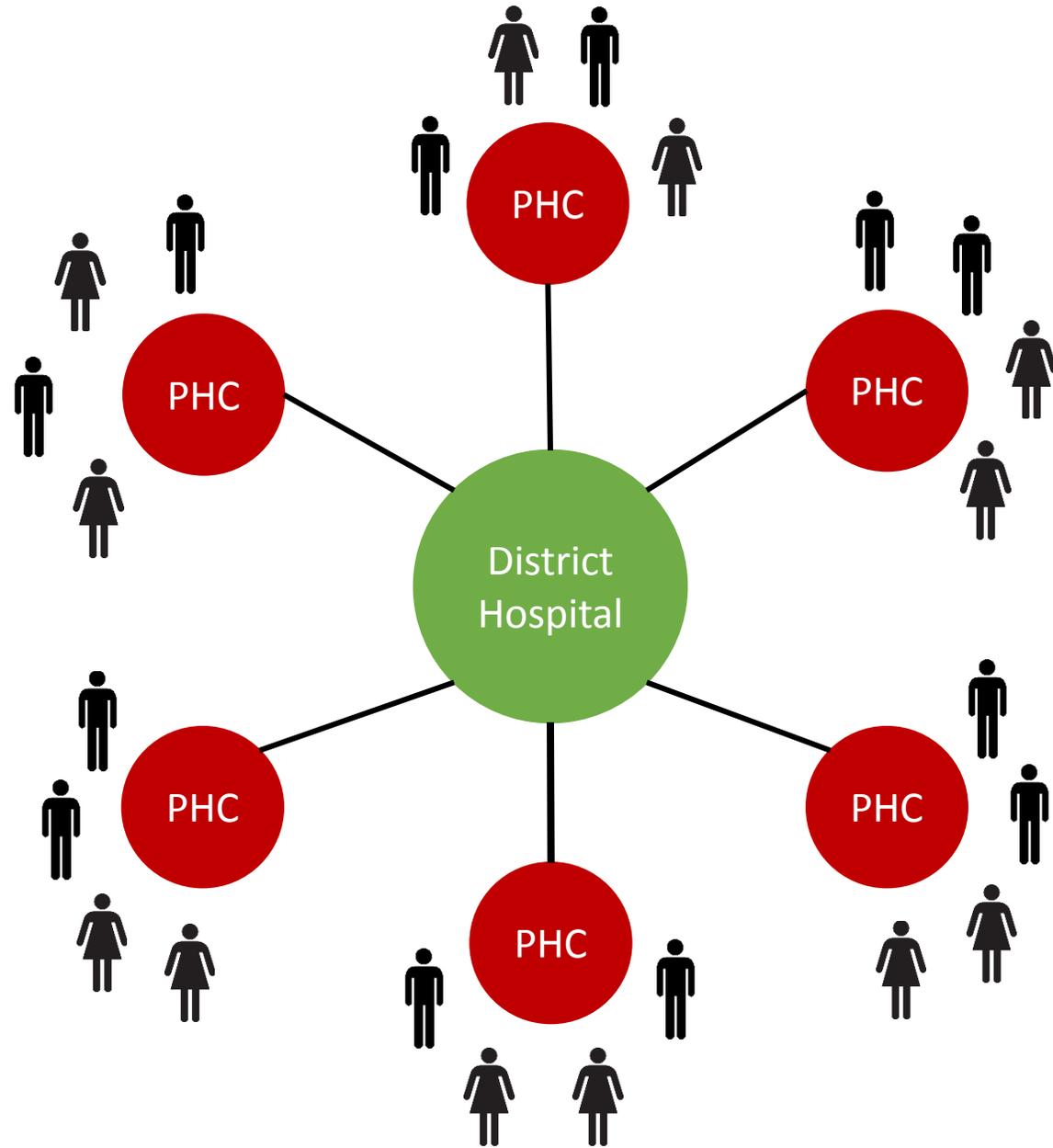
Management of multiple morbidities through primary care

Community based care for chronic conditions and risk factors in families



Integration of care of specific diseases in primary care





Re-engineering personalized health care for chronic conditions: the 4C approach

Supporting individuals and families to care for and prevent chronic conditions through care which is:

Collaborative

Coordinated

Continuing

Community based



Acknowledgements

- Shivani Patel
- Preet Dhillon
- Agnes Becker
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- Mo Ali
- Alize Ferrari
- Inge Petersen
- Dilip Kumar

Supported by
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Professor Vikram Patel FMedSci

Re-engineering personalised medicine for chronic conditions



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