The Importance of Local Research in Developing Health Strategy

– The Case of Cardiovascular Disease Prevention in Sri Lanka

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Part 1

Background

Cardiovascular disease (CVD) in Sri Lanka

- Largest single cause of mortality
  - 16% in 2005
- Largest single disease component in national health spending
  - 8% in 2005
- ASMRs for CVD substantially higher in Sri Lanka than in developed nations, despite being poorer
- Leading reason for stagnation in adult male life expectancy in Sri Lanka since 1970s

Explanations for higher IHD/CVD mortality in Sri Lanka

Not important

- Smoking
- Hypertension
- Obesity
- Physical inactivity

Important

- High lipid levels/diet
- Inadequate treatment – medical therapy in high risk individuals, clinical management

Evolution of CVD/IHD strategy in Sri Lanka

- 2000s
  - Growing global evidence of importance of medical therapy in improving population outcomes
  - Consensus at WHO HQ of necessity of IHD secondary prevention in developing countries
  - Rejection of global and local research evidence in Sri Lanka
    - Dominant influence of international agencies on MOH
- Early 2010s
  - Decision to fund preventive therapy in high risk patients
  - Adoption of WHO PEN strategy

Current MOH approach

Official response

- Establishment of 650 Healthy Lifestyle Centres (HLCs) to screen adults for NCDs
- CVD high-risk patients to be prescribed anti-hypertensives, statins
- Ear-marked budget allocation for NCD medicines (Rs 350 million)

Informal response

- Continued development of NCD clinics in secondary/ tertiary hospitals to manage patient burden

MOH screening strategy

- Adults aged 40–65 to visit HLCs for screening
  - BP, FBG, BMI, smoking status
  - CVD risk estimated using WHO/ISH chart, assuming cholesterol = 5 mmol/L

- Prescribe therapy
  - CVD risk>30% Rx statin
  - CVD risk>30% + BP>130/80 Rx statin + Anti-HT
  - CVD risk>20% + BP>140/90 Rx Anti-HT

Critical questions

How does this compare?

Treatment protocol	Treatment indicators				
	hypoglycaemic	antihypertensive		statin	
Sri Lankan protocol	fasting BSL > 7 mmol/L (126mg/dL)	BP ≥ 160/100	CVD risk of 20-30% with BP > 140/90 CVD risk of > 30% with BP > 130/80	CVD risk > 30%	
Sri Lankan protocol (cholesterol known)	fasting BSL > 7 mmol/L (126mg/dL)	BP ≥ 160/100	CVD risk of 20-30% with BP > 140/90 CVD risk of > 30% with BP >130/80	CVD risk > 30%	cholesterol ≥ 8 mmol/L
New Zealand Guidelines 2012	fasting BSL > 7 mmol/L (126mg/dL)	BP ≥ 170/100	CVD risk of > 15% with BP> 130/80	CVD risk > 15%	cholesterol ≥ 8 mmol/L
UK NICE 2014	HbA_{1c} > 6.5%	BP ≥ 160/100	CVD risk ≥ 20% with BP > 140/90	CVD risk ≥ 10%	cholesterol ≥ 8 mmol/L

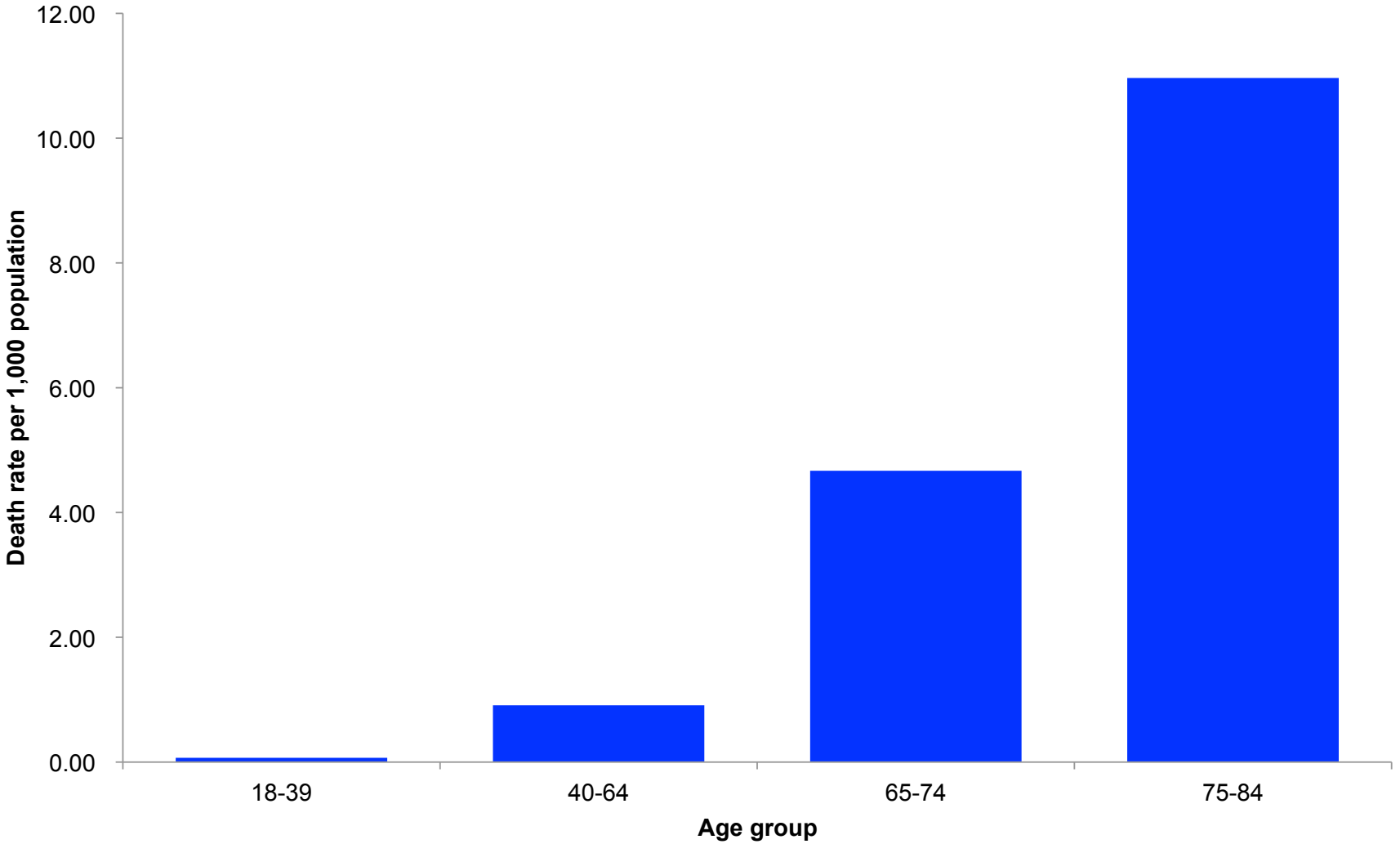
- Why only 40–65 years?
- Why these risk thresholds?

Critical questions

Answers

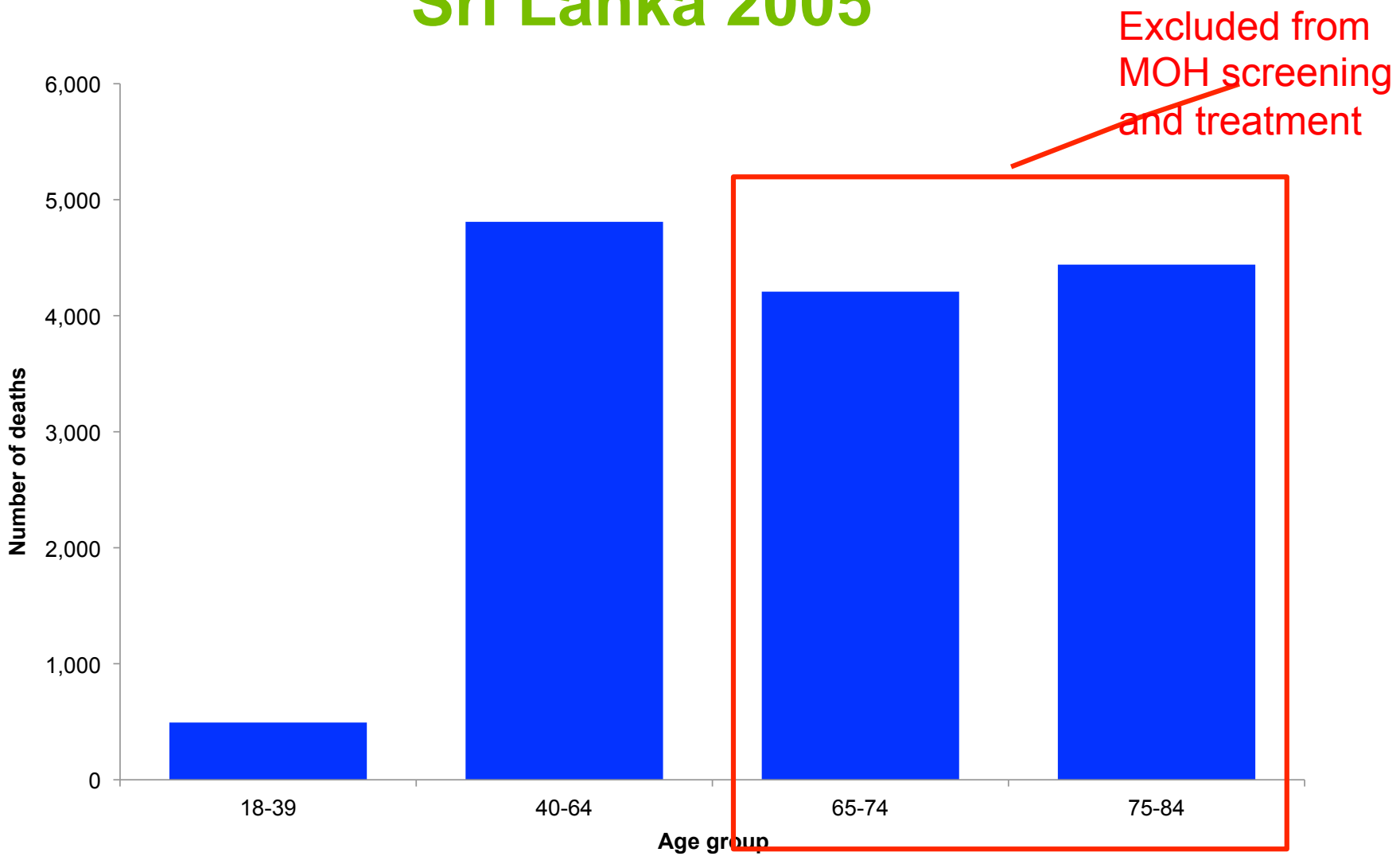
- Because that's what WHO recommends for developing countries in our region
  - Medicines and screening options are expensive or limited
- No analysis done of Sri Lankan epidemiological data or health systems costs which differ significantly to other lower income countries
- CVD deaths in Sri Lankans aged>65 years deemed small in number and less priority

CVD mortality rates by age group
Sri Lanka 2005



Source: IHP analysis of RG Mortality Data, 2005

CVD deaths by age group
Sri Lanka 2005



Source: IHP analysis of RG Mortality Data, 2005

Part 2

Our research assessing alternative strategies to screen and treat high CVD risks

Screening protocols assessed

Using Sri Lanka Diabetes & Cardiovascular Survey (SLDCS) 2005

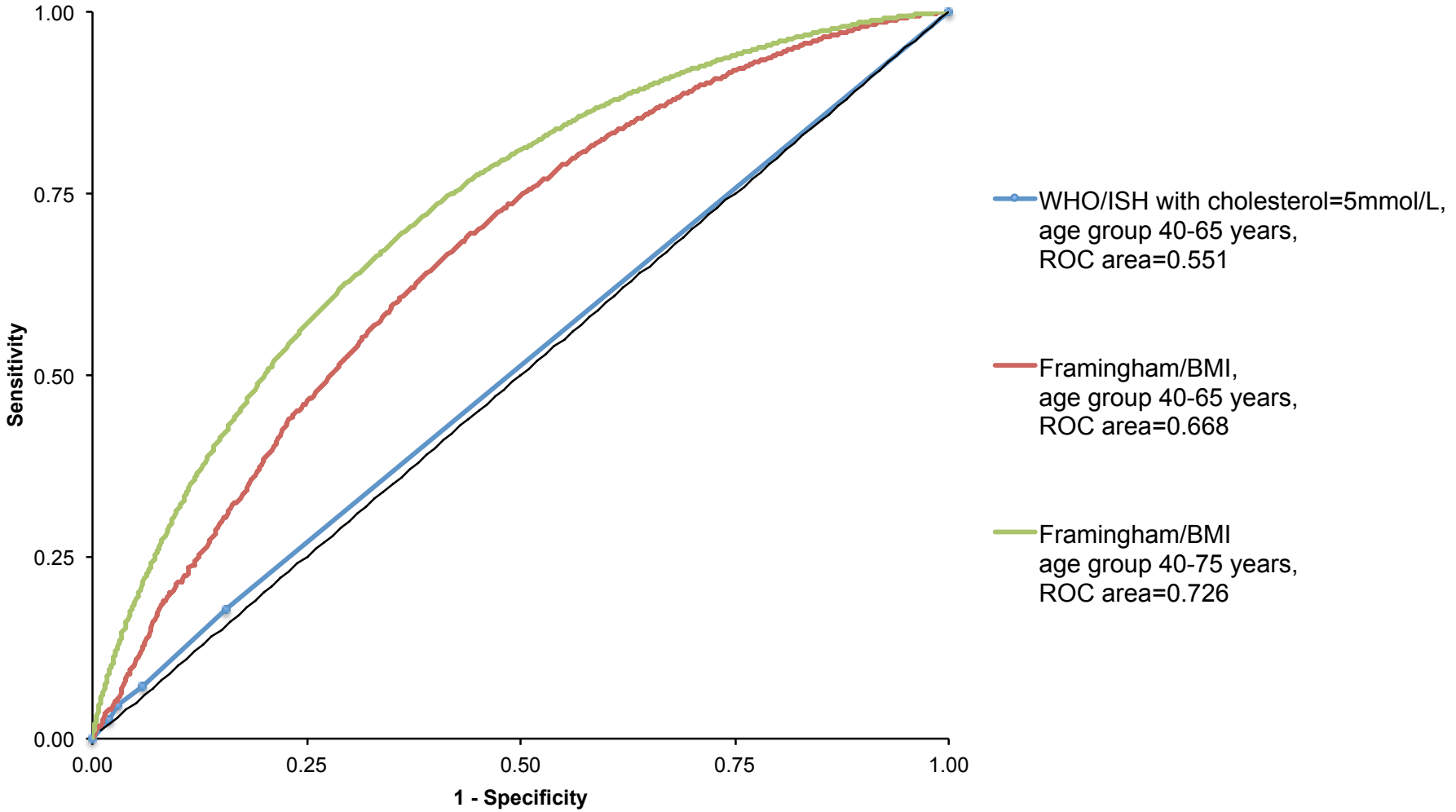
1. **Current MOH approach**
   - 40–65 years
   - Age, Sex, BP, FBG, WHO/ISH charts

2. **Framingham risk prediction model using BMI instead of cholesterol**
   - 40–65 years
   - Age, Sex, BP, FBG, BMI

3. **Framingham risk prediction model using BMI instead of cholesterol**
   - 40–75 years
   - Age, Sex, BP, FBG, BMI

Receiver operating characteristic (ROC) curves for CVD screening protocols

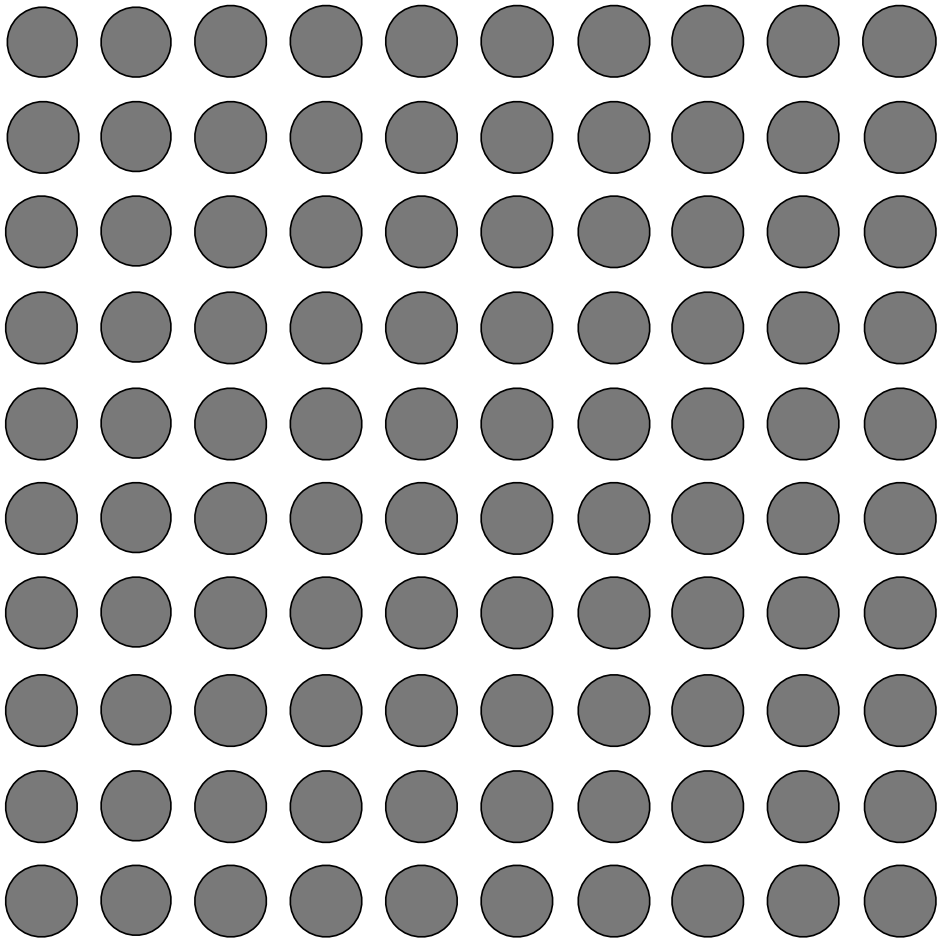
40-75 year olds in Sri Lanka



Source: IHP analysis of Katulanda et. al (2008) survey data

Impact of screening and treatment protocols on CVD deaths over 10 years

Projected deaths with no intervention from 2005 baseline

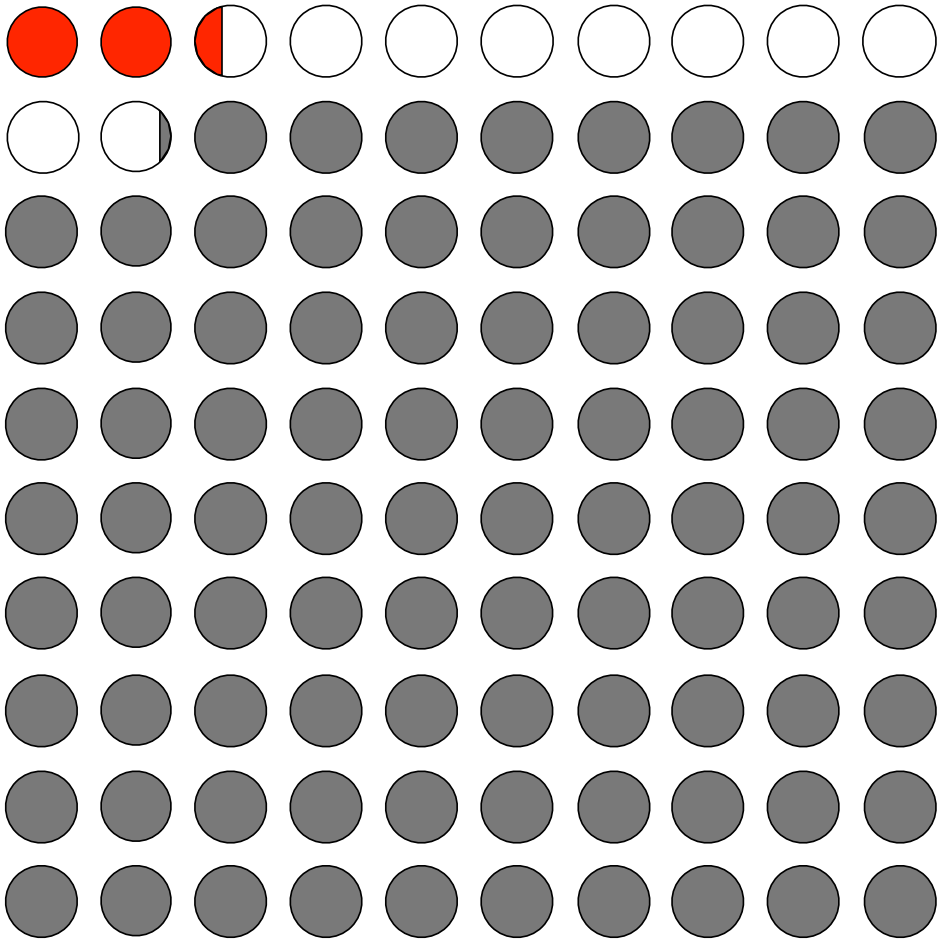


Deaths due to CVD, without treatment of risk factors

Source: IHP analysis of Katulanda et. al (2008) survey data

Impact of screening and treatment protocols on CVD deaths over 10 years

Current MOH therapy (40–65 years)



Deaths due to CVD, without treatment of risk factors

Deaths due to CVD, despite treatment of risk factors

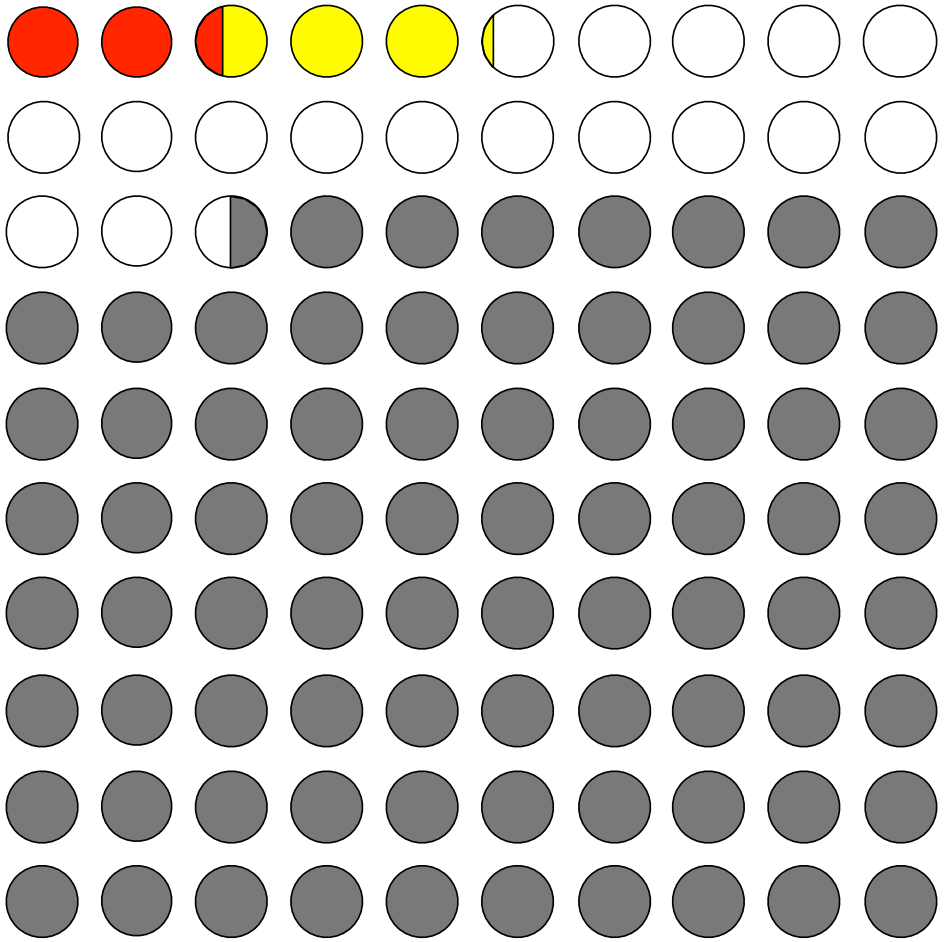
CVD deaths avoided by various screening and treatment protocols:

WHO/ISH, chol=5mmol/L screening + SL treatment 40-65 years

Source: IHP analysis of Katulanda et. al (2008) survey data

Impact of screening and treatment protocols on CVD deaths over 10 years

MOH therapy + Framingham risk prediction using BMI (40–65 years)



Deaths due to CVD, without treatment of risk factors

Deaths due to CVD, despite treatment of risk factors

CVD deaths avoided by various screening and treatment protocols:

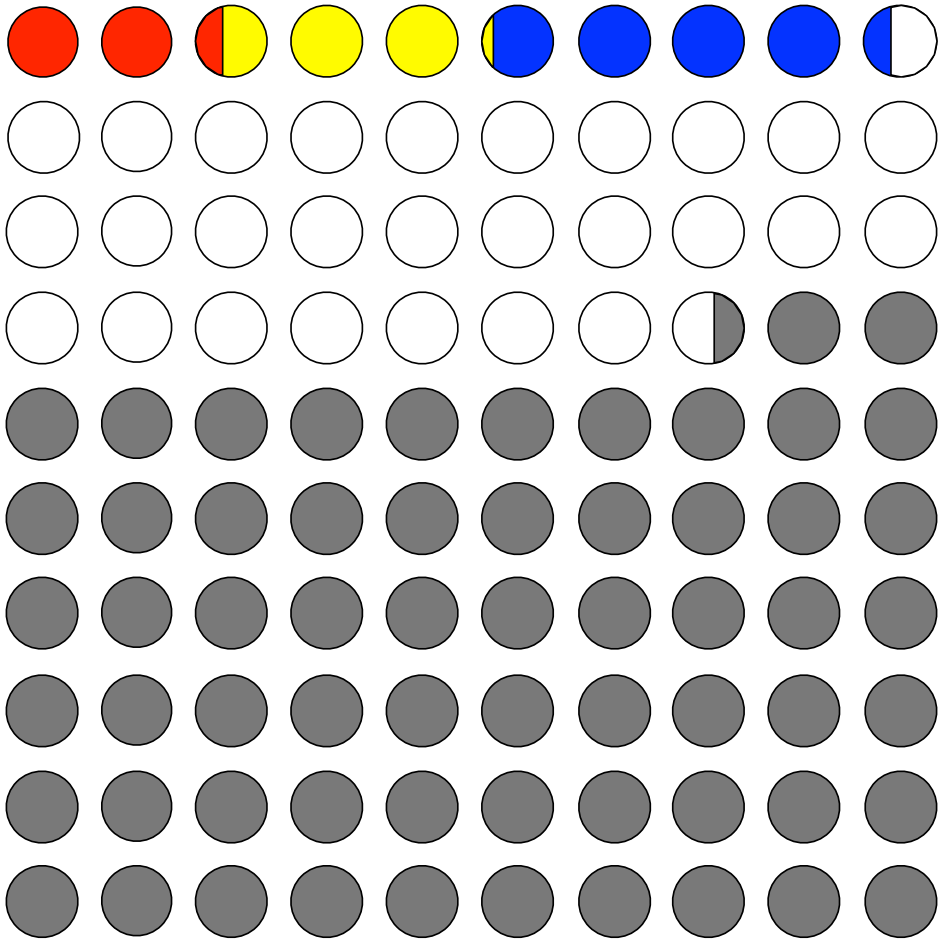
WHO/ISH, chol=5mmol/L screening 40-65 years + SL treatment

Framingham/BMI screening 40-65 years + SL treatment

Source: IHP analysis of Katulanda et. al (2008) survey data

Impact of screening and treatment protocols on CVD deaths over 10 years

MOH therapy + Framingham risk prediction using BMI (40–75 years)



Deaths due to CVD, without treatment of risk factors

Deaths due to CVD, despite treatment of risk factors

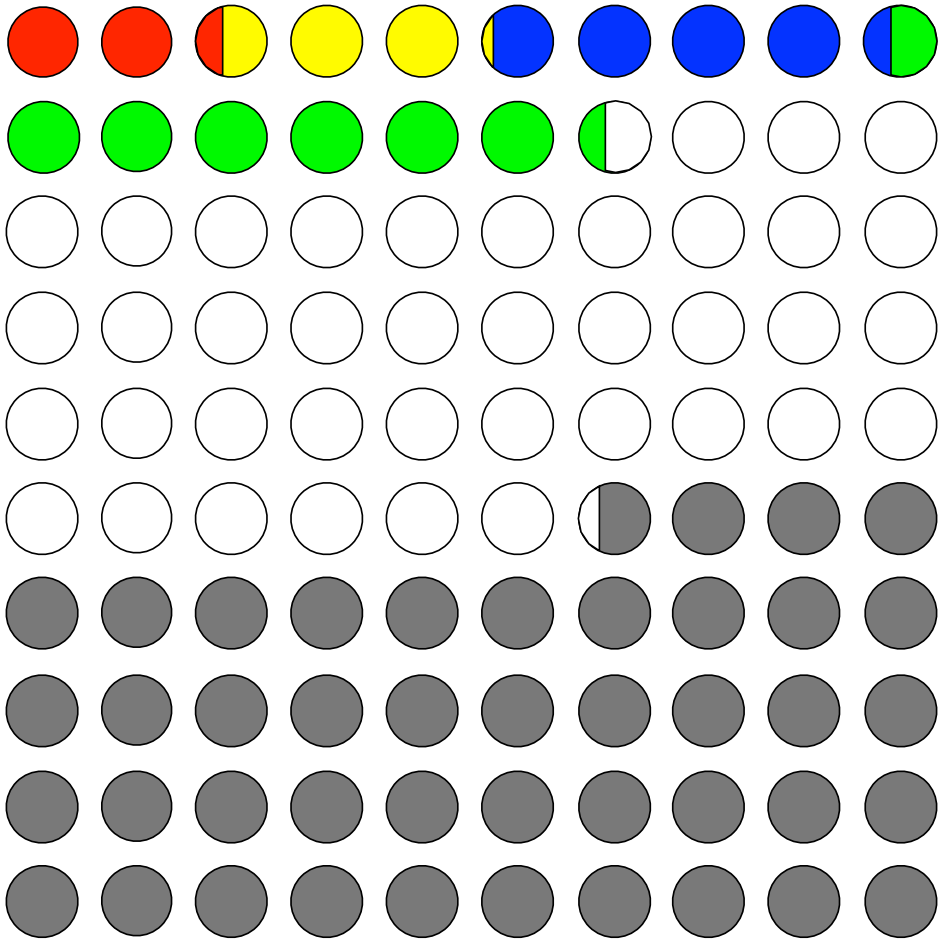
CVD deaths avoided by various screening and treatment protocols:

- WHO/ISH, chol=5mmol/L screening 40-65 years + SL treatment
- Framingham/BMI screening 40-65 years + SL treatment
- Framingham/BMI screening Expanded age group (40-75 years) + SL treatment

Source: IHP analysis of Katulanda et. al (2008) survey data

Impact of screening and treatment protocols on CVD deaths over 10 years

NZ guidelines + Framingham risk prediction using BMI (40–75 years)



Deaths due to CVD, without treatment of risk factors

Deaths due to CVD, despite treatment of risk factors

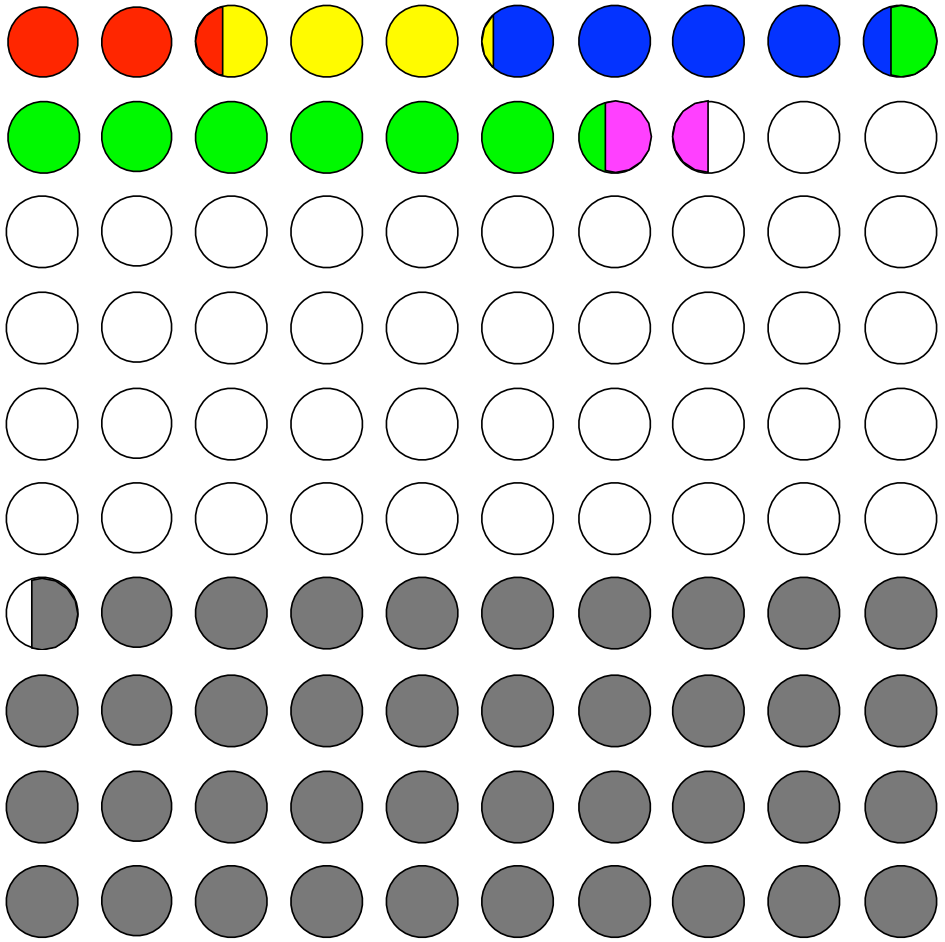
CVD deaths avoided by various screening and treatment protocols:

- WHO/ISH, chol=5mmol/L screening 40-65 years + SL treatment
- Framingham/BMI screening 40-65 years + SL treatment
- Framingham/BMI screening Expanded age group (40-75 years) + SL treatment
- Framingham/BMI screening Expanded age group (40-75 years) + New Zealand treatment

Source: IHP analysis of Katulanda et. al (2008) survey data

Impact of screening and treatment protocols on CVD deaths over 10 years

MOH therapy + Framingham risk prediction using Chol (40–75 years)



Deaths due to CVD, without treatment of risk factors

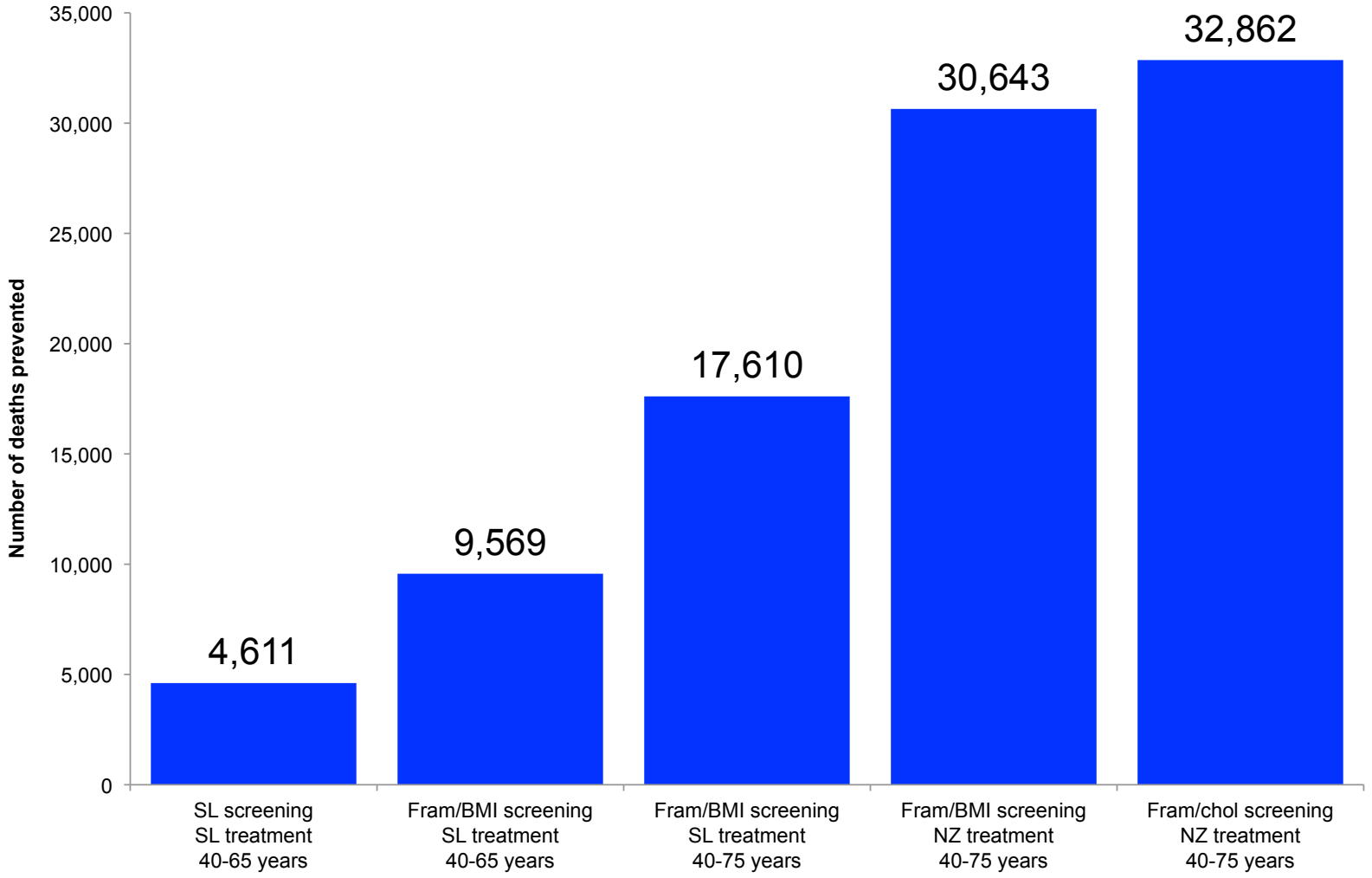
Deaths due to CVD, despite treatment of risk factors

CVD deaths avoided by various screening and treatment protocols:

- WHO/ISH, chol=5mmol/L screening 40-65 years + SL treatment
- Framingham/BMI screening 40-65 years + SL treatment
- Framingham/BMI screening Expanded age group (40-75 years) + SL treatment
- Framingham/BMI screening Expanded age group (40-75 years) + New Zealand treatment
- Framingham/cholesterol screening Expanded age group (40-75 years) + New Zealand treatment

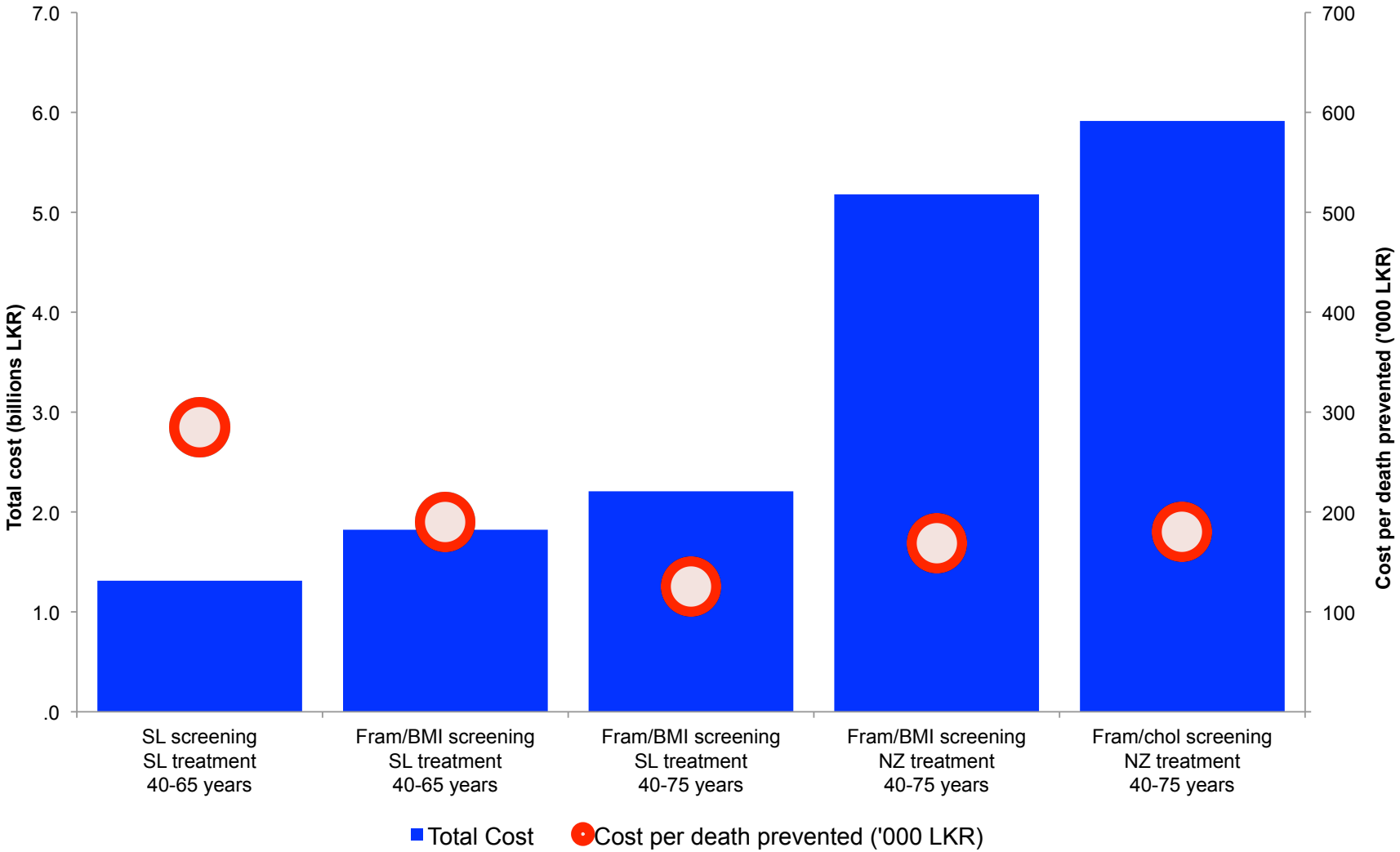
Source: IHP analysis of Katulanda et. al (2008) survey data

Deaths prevented by strategy, over 10 years



Source: IHP analysis of Katulanda et. al (2008) survey data

Total cost and cost/death prevented by strategy, over 10 years



Source: IHP analysis of Katulanda et. al (2008) survey data

Part 3

Conclusions

Why are WHO recommendations so off-target?

- Methodology
  - WHO protocols never validated using real data
  - Recent Malaysia validation study confirms poor results
- Epidemiology
  - Much older population in SrI Lanka than other comparable developing countries owing to longer life expectancy
- Costs
  - Much lower medicine prices owing to highly efficient MOH purchasing
  - Cost of 1 year of statins
    - Nepal $ 52, Pakistan $ 59, Sri Lanka $ 14 [WHO 2005]
    - UK $ 59, Sri Lanka $ 4 [Current prices]

Should and could local research have informed MOH strategy?

- Should? – YES
  - Current IHD prevention strategies imply placing 1 million+ Sri Lankans on therapy. Getting it right matters from both an ethical and cost perspective
  - Optimal strategy critically depends on local factors

- Could? - YES
  - Sri Lanka had the data to model impacts
  - Sri Lanka had the knowledge in its research community to model impacts

Challenges in improving national strategy and contribution of local research?

- Awareness and willingness of government to make use of local research capacity
  - Bureaucratic staffing deprives MOH of institutional memory and technical expertise
  - Barriers to collaboration with experts outside MOH
  - Failure to appreciate knowledge implications of unique Sri Lanka health situation
- Research funding and strategy
  - Lack of framework to align local research effectively towards national health goals
  - Lack of funding for health services research