Cardiosvascular Disease Prevention through Dietary Salt Reduction

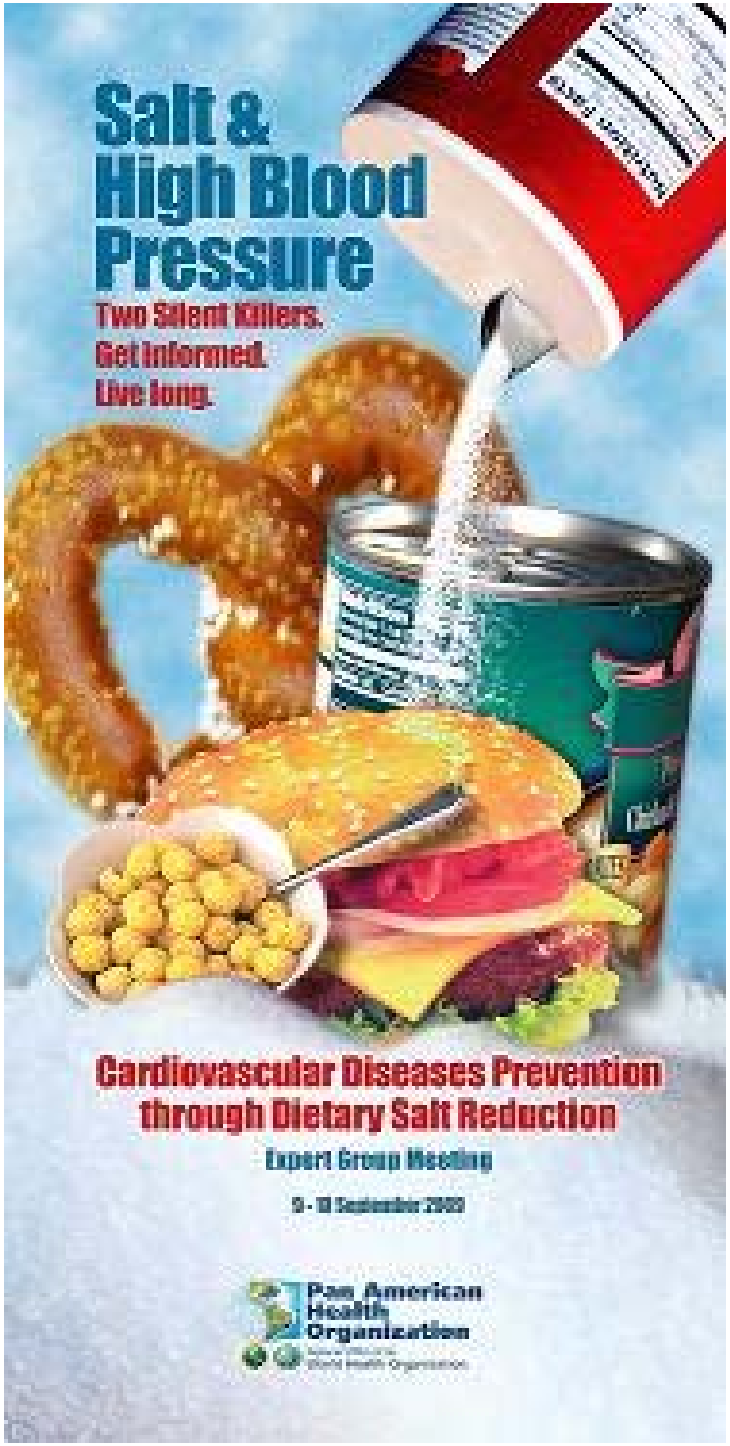
First PAHO Expert Group Meeting

Washington, D.C.

9-10 September 2009

Pan American Health Organization

Regional Office of the World Health Organization



Cardiovascular Disease Prevention through Dietary Salt Reduction
Washington, D.C: Sept 9-10, 2009

Salt, economics and health

Dan Chisholm, PhD

Dept of Health Systems Financing, WHO Geneva

World Health Organization

Royal Saltworks at Arc-et-Senans (Doubs, France)

Salt and the economy

- Salt is an essential physiological need for human life, yet historically supply was scarce; salt was therefore a highly valued resource …
  … so much so that people were paid – or indeed sold – in units of salt (a 'salary'), & were prepared to take up arms in order to exercise control over it, e.g. in order to monopolise supply & raise taxes

- Salt still state-monopolised in most countries, but supply is now plentiful and cheap, meaning that a key concern today is one of excessive demand / over-consumption, in particular its effects on CVD outcomes (and ultimately on economic output /productivity)

- So where before the concern with salt was all about *increasing & protecting supply / production*, the concern now is around *reducing demand & protecting the public health*

How to reduce demand for / consumption of salt?

Strategy	Example	State intervention
Promotion	*Mass media awareness campaign*	Light
Regulation	*Voluntary or mandatory code of conduct for food manufacturers*	Moderate
Taxation	*Excise tax on salt (use to subsidise healthy foods?)*	Heavy
Substitution	*Replace sodium with potassium*	Heavy

Economic evidence from the literature

Authors	Interventions assessed	Design / Setting
Selmer et al (JEPH, 2000)	*Information campaign* *Reduced & declared salt content by industry* *Tax and subsidies*	Simulation model Norwegian popn (40+ yrs) 25 yrs of health effects
Murray et al (Lancet, 2003)	*Voluntary cooperation of manufacturers to reduce salt in processed foods, plus labelling* *Legislation and enforcement of reduced salt in processed foods, plus labelling*	Cost-effectiveness model WHO regions (30+ yrs) 10 yrs of health effects
Asaria et al (Lancet, 2007)	*Mass media awareness campaign* *Voluntary cooperation of manufacturers to reduce salt in processed foods, plus labelling*	Scaling-up model 23 large developing countries (30+ yrs) 10 yrs of health effects

Costs and consequences of reduced salt intake in Norway over 25 year

(Selmer et al; JEPH, 2000)

Implementation costs	US$, million	Avoided costs (economic benefits)	US$, million
Information campaign & devt of new recipes	45	Reduced hypertension treatment	147
Taxes & subsidies	355	Increased productivity	404
Health care costs in extended years of life	223	Avoided care for MI & stroke	286
		Avoided time losses	23
Total implementation costs	**625**	**Total avoided costs**	**862**

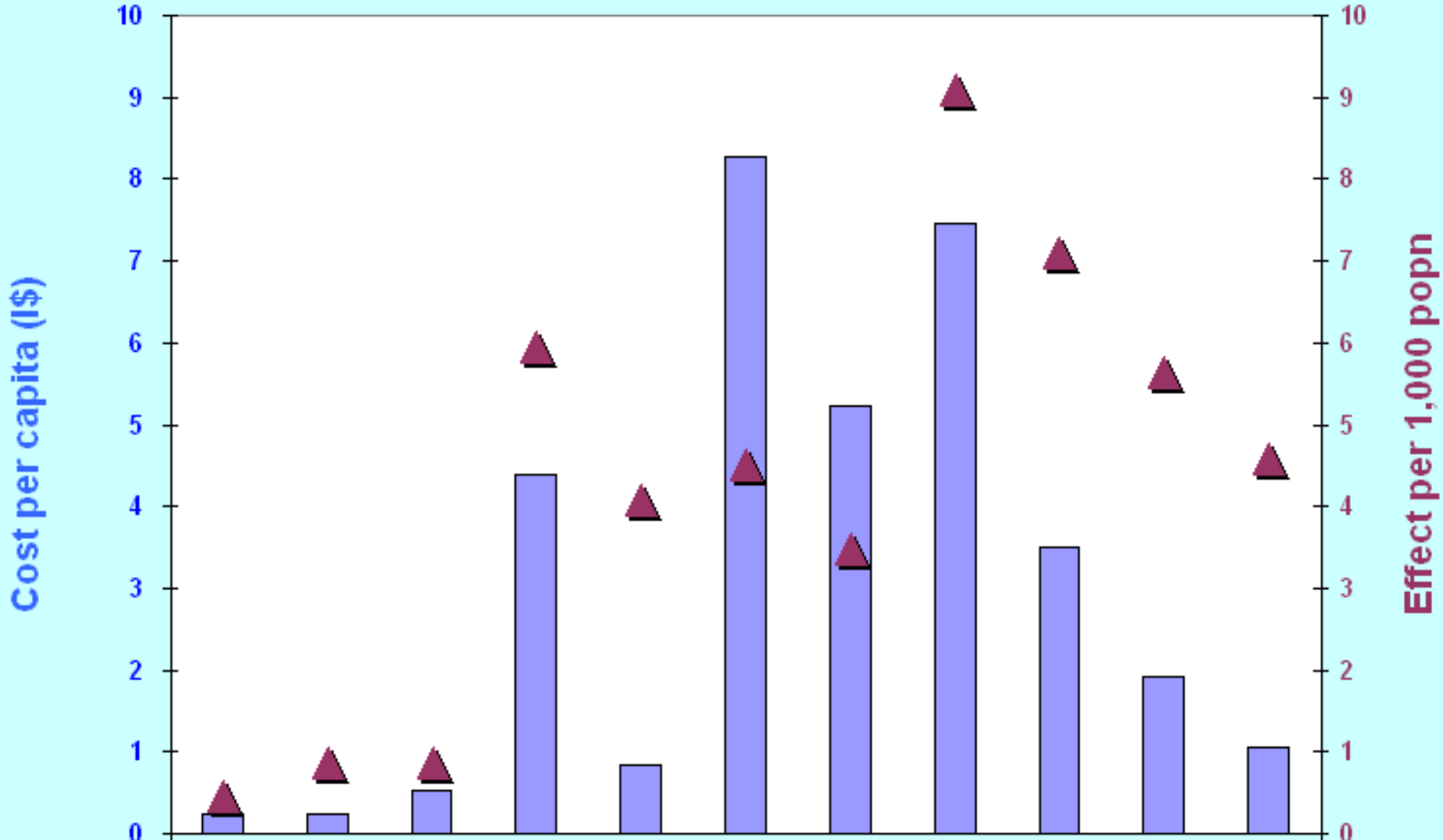
Net cost / gain: *$ 237 million*

WHO cost-effectiveness analysis of CVD prevention

(Murray et al; Lancet, 2003)

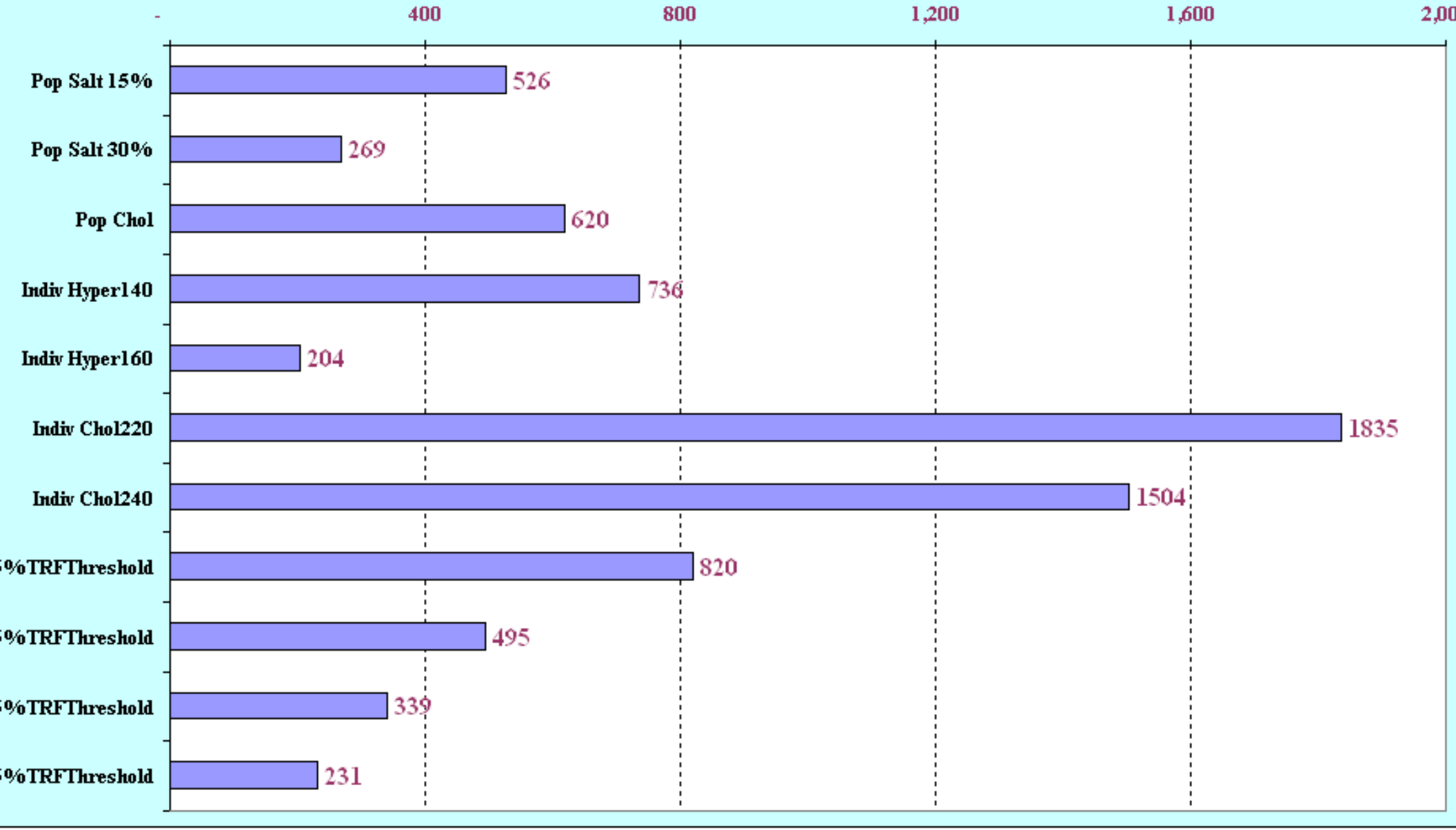
- Comparative, population-based, sector-wide approach, operationalised via the CHOICE project (CHOosing Interventions that are Cost-Effective; www.who.int/choice)
  - effectiveness: healthy years gained / DALYs averted over the lifetime of a population, with and without intervention(s) in place
  - resource costs: patient + programme level (international $)
- Range of current and new/potential interventions assessed
  - personal: anti-hypertensive and ant-cholesterol drugs; poly-drug thearpy / absolute risk approach
  - non-personal: salt (15 and 30% reduction); mass media to reduce cholesterol
- Results summarised in WHO regional C-E databases
  - available for country-level adaptation / analysis

Costs and effects of CVD prevention; WHO sub-region AmrB



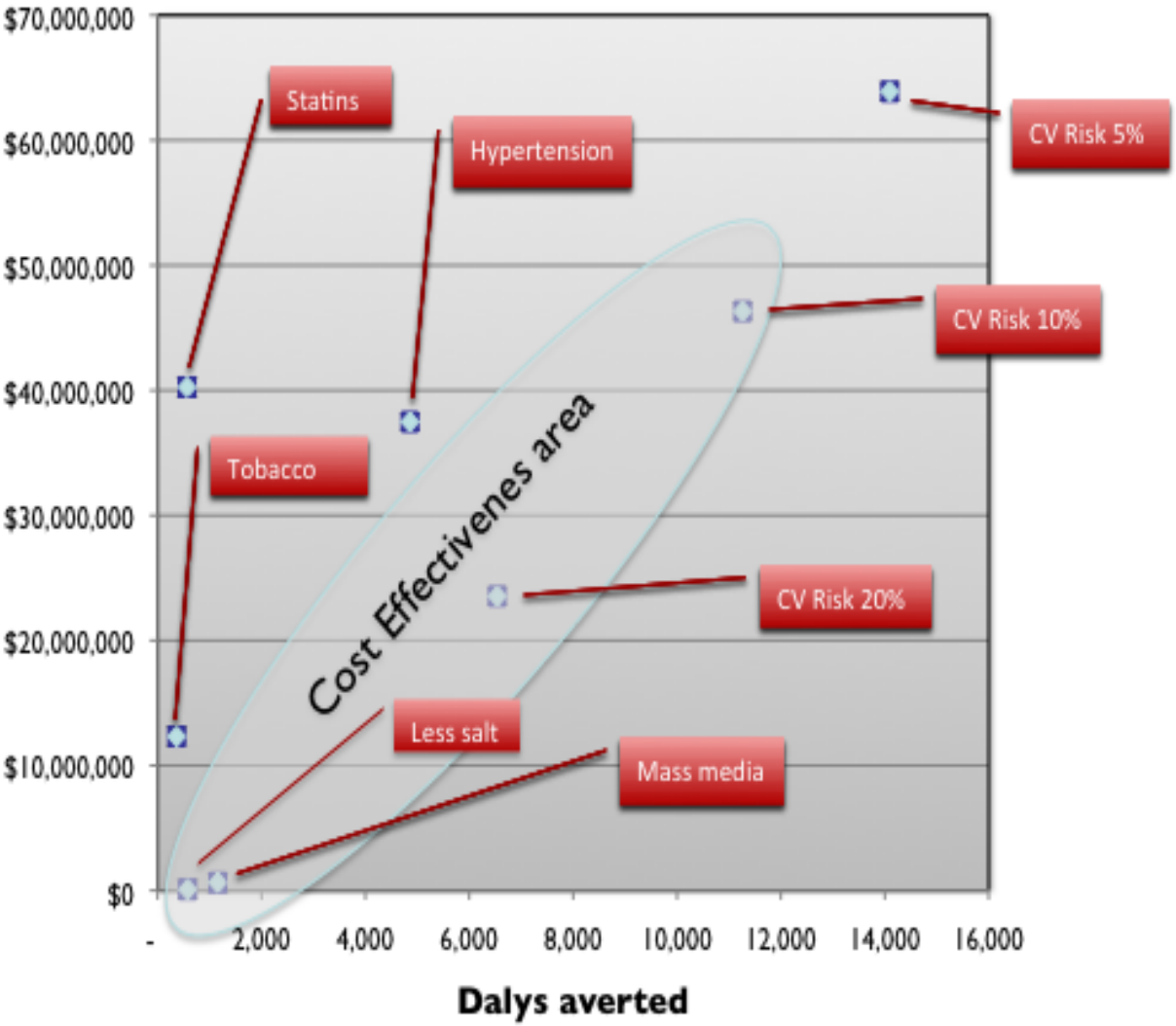
	Pop Salt 15%	Pop Salt 30%	Pop Chol	Indiv Hyper140	Indiv Hyper160	Indiv Chol220	Indiv Chol240	5%TRFT hreshold	15%TRF Threshold	25%TRF Threshold	35%TRF Threshold
Intervention cost per year per capita (I$) I$	0.23	0.23	0.53	4.38	0.83	8.27	5.22	7.45	3.51	1.91	1.06
Annual DALYs averted per 1,000 popn (DALYs averted)	0.44	0.87	0.86	5.95	4.08	4.51	3.47	9.09	7.09	5.64	4.58

Cost-effectiveness of CVD prevention (I$ per DALY averted); WHO subregion AmrB



WHO-CHOICE contextualisation study in Buenos Aires

(Rubinstein et al; CERA, 2009)



Key points

- Chronic disease accounts for > 50% of disease burden in Argentina
- Salt use per head in Argentina = 12g per day (3.4g from bread)
- Intervention: to remove 1 gram of salt per 100 grams of bread made / sold
- Less salt in bread
  - **Low cost**
    (< ARS$ 100k per year, for city of 3m)
  - **Highly cost-effective**
    (ARS$ 151 per DALY averted)
  - **Modest health gain**
    (compared to poly-drug therapy for individuals at high risk of a CVD event

Scaling-up salt interventions; costs and health impacts

(Asaria et al; Lancet, 2007)

- Intervention: Reduce daily salt intake in popn by 15%
  - Work with industry to reduce salt content of prepared food
  - Sustained mass media campaign to reduce salt added in cooking and at the table
- Costs & effects (in 23 low- & middle-income countries):
  - Financial outlay (per person per year): US$ 0.04 - 0.32
  - Health impact (over 10 years): 8.5 million deaths prevented

Estimated change in mean SBP (mm Hg) as a result of 100 mmol per day (5·8 g per day) change in sodium intake

	Men				
	30–44 years	45–59 years	60–69 years	70–79 years	80–100 years
Law and colleagues[17,45]	5·81	7·03	10·43	12·99	16·03
Intersalt study[60]*	2·1	2·1	2·1	2·1	2·1

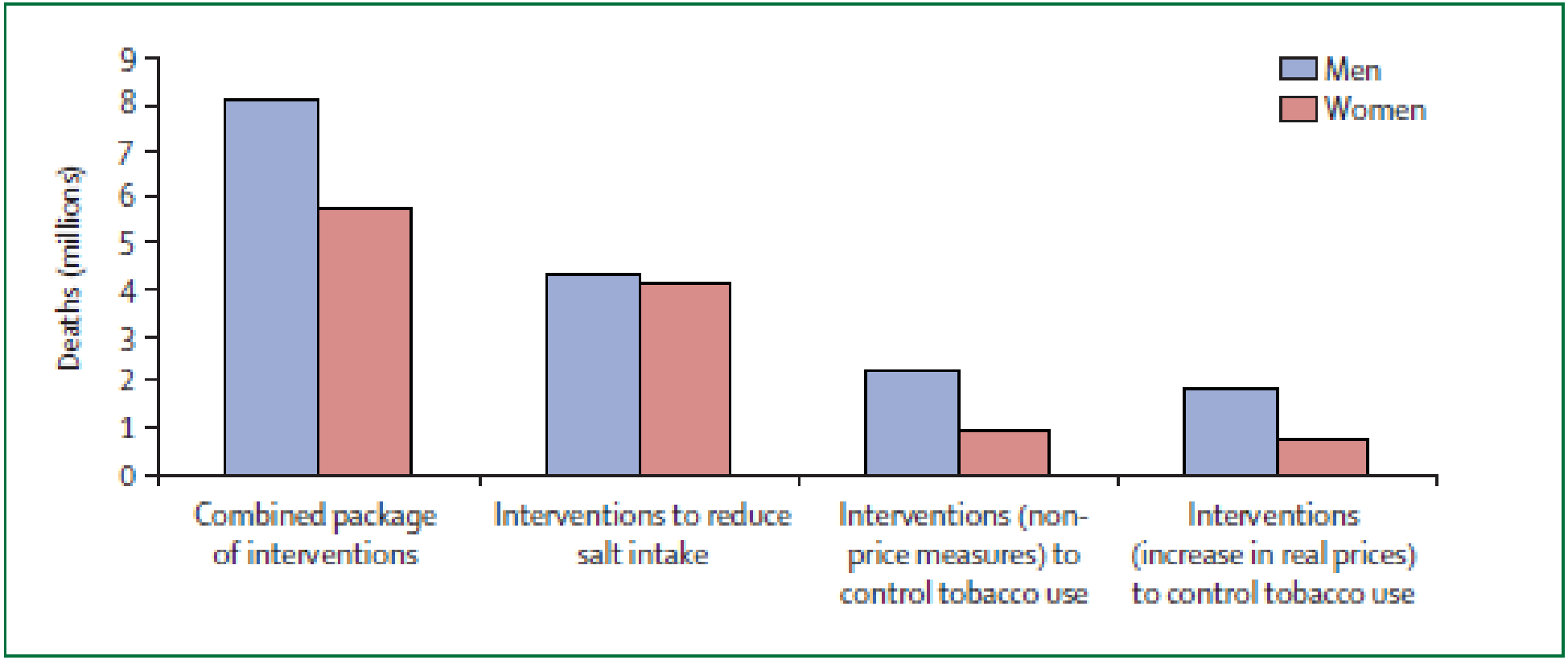
Data from Law and colleagues are means; those from Intersalt are medians.

* the uncorrected coefficient from the Intersalt data in the sensitivity analysis. *Correcting the Intersalt coefficient for regression dilution bias results in values similar to those in other studies; however, the method of applying the correction is controversial.*

	30–44 years	45–59 years	60–69 years	70–79 years	80–100 years
alt-reduction intervention					
eduction in salt intake (g per day)*	1·70 (0·42)	1·69 (0·46)	1·68 (0·46)	1·68 (0·46)	1·68 (0·46)
ecrease in mean systolic blood pressure (mm Hg)†	1·24 (0·26)	1·70 (0·37)	2·34 (0·52)	2·83 (0·64)	3·46 (0·82)

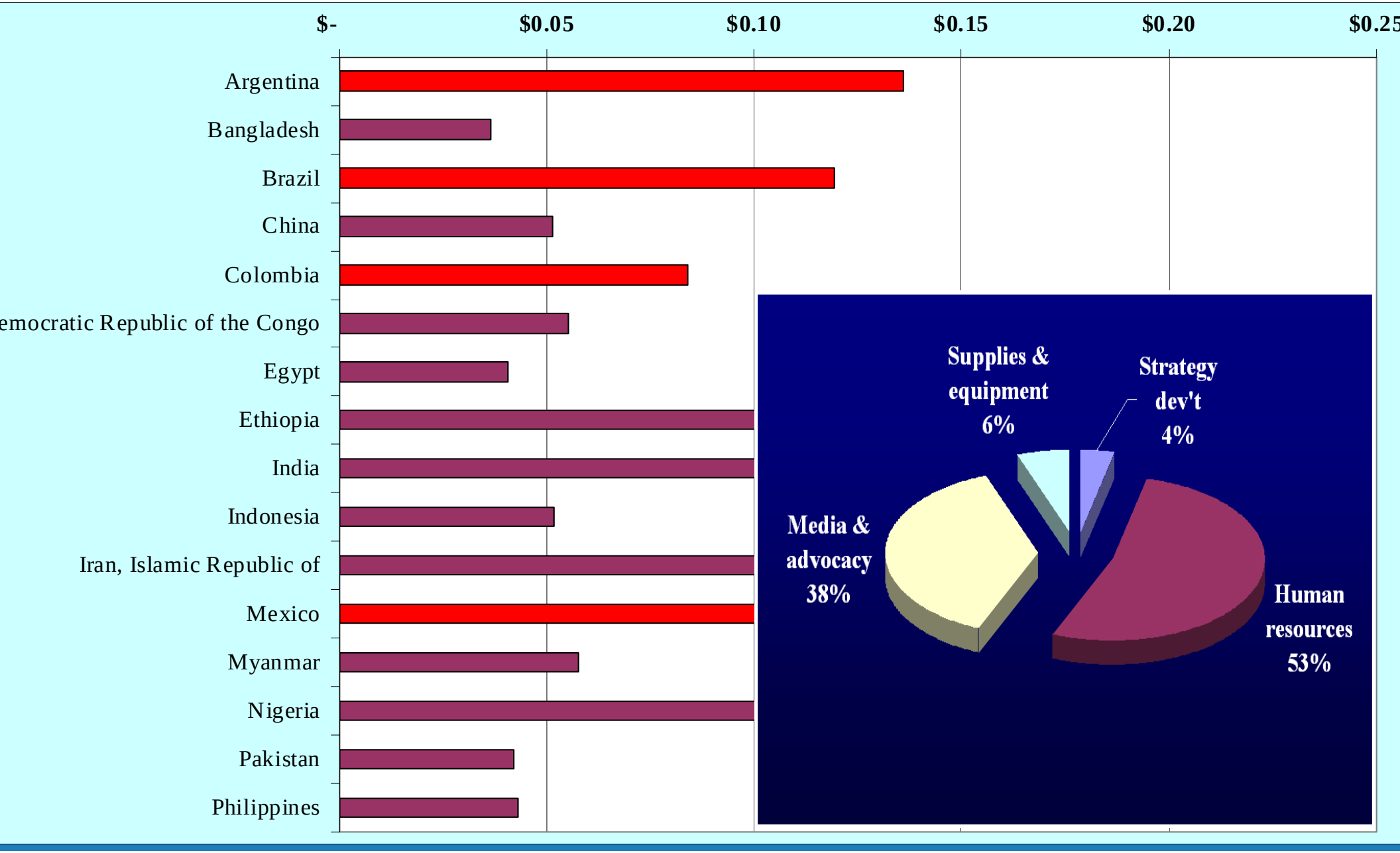
Estimated health impact of salt reduction & tobacco control strategies in 23 large low- & middle-income countries

(Deaths averted, 2006-2015)



Estimated cost of a salt reduction programme

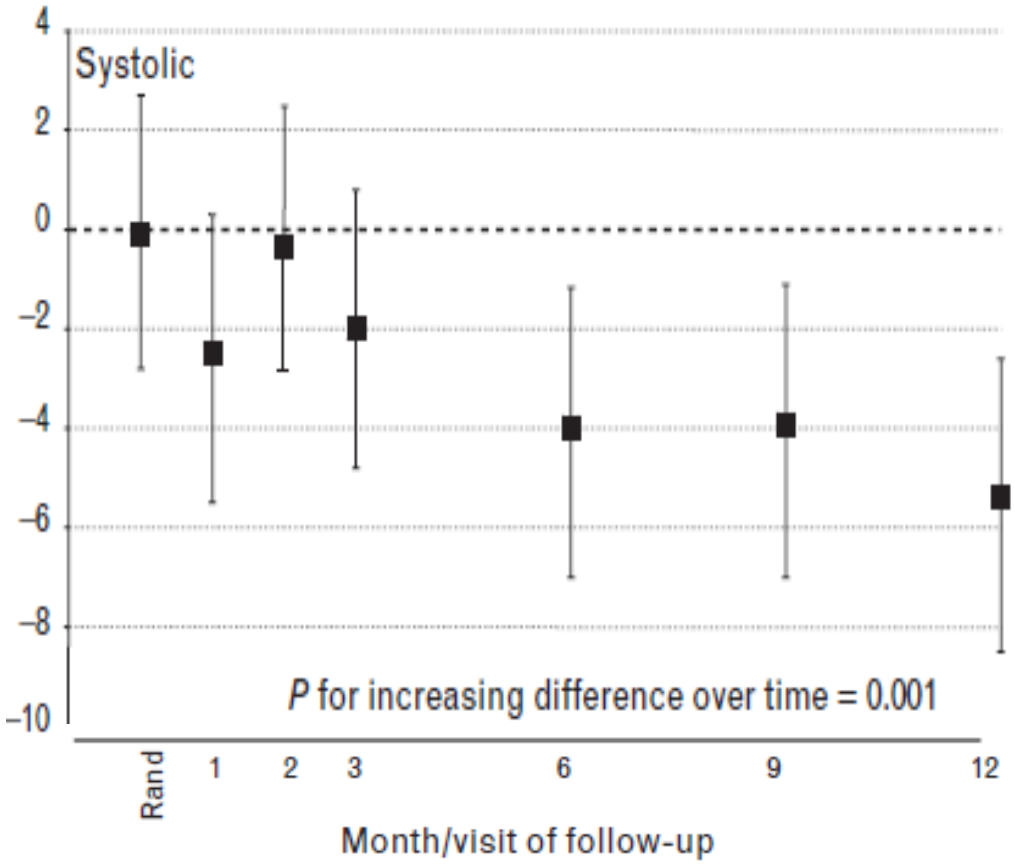
(US$ per person per year, 2005)



Salt substitution: China study
(Neal et al, J Hypertension, 2007)

- Effectiveness

SBP change: 3.7 mmHg



- Costs & cost-effectiveness
  - Not specifically assessed
  - But v low cost as intervention is implemented at source of supply / manufacture (similar to voluntary agreement to reduce salt levels)
  - Cost-effectiveness expected to be as favourable as the 15% reduction modelled in CHOICE (which also resulted in SBP change of 3-4 mmHg)
  - Practical and feasible to implement

Salt, economics and health - conclusions

- The market value / price of salt has diminished over time:
  - No longer the 'salvation' it once was..? (you can have too much of a good thing)
  - Demand strong / inelastic, but supply now cheap, so tax no longer a good option?
- The economic value of intervention is high:
  - Millions of deaths can be averted for an investment of less than 50 cents per capita
  - Each healthy life year gained costs a small fraction of average income per capita (CMH / CHOICE threshold for considering an intervention to be v cost-effective)
- Transaction costs of getting something done are low / modest