



Health behaviour intervention priorities in low and middle income countries, with a focus on diet related disorders and physical inactivity

Presentation: Faculty of Medical Sciences,
University of the West Indies, 11 Jan 12

Social science that makes a difference

Karl Peltzer & Supa Pengpid



Overview

1. Transition, Risk factors, Burden of disease
2. Other diet-related risk factors & physical inactivity
3. Health behaviour interventions (Pengpid)

The Demographic Transition

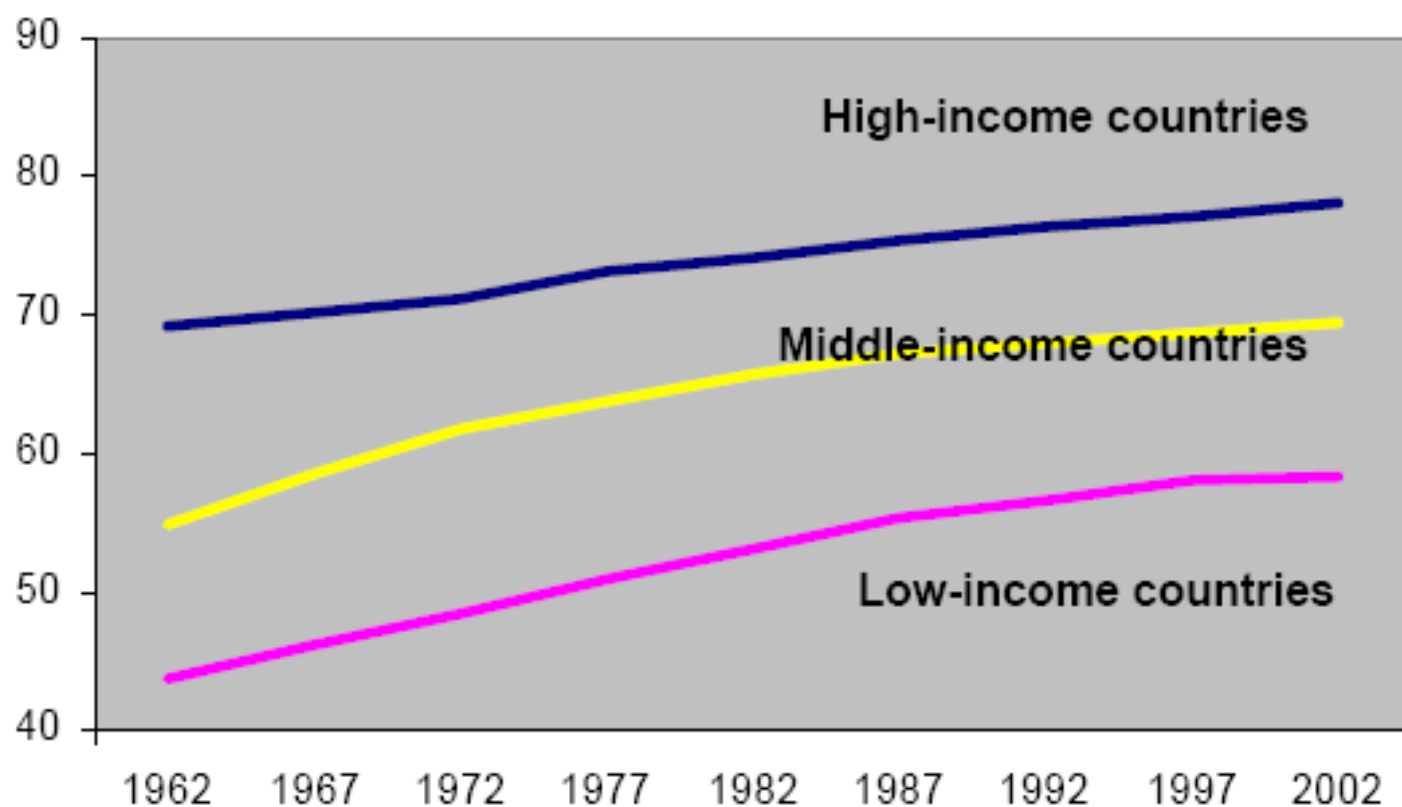
- **A change in the population dynamics of a country as it moves from high fertility and mortality rates to low fertility and mortality rates.**

The Epidemiologic Transition

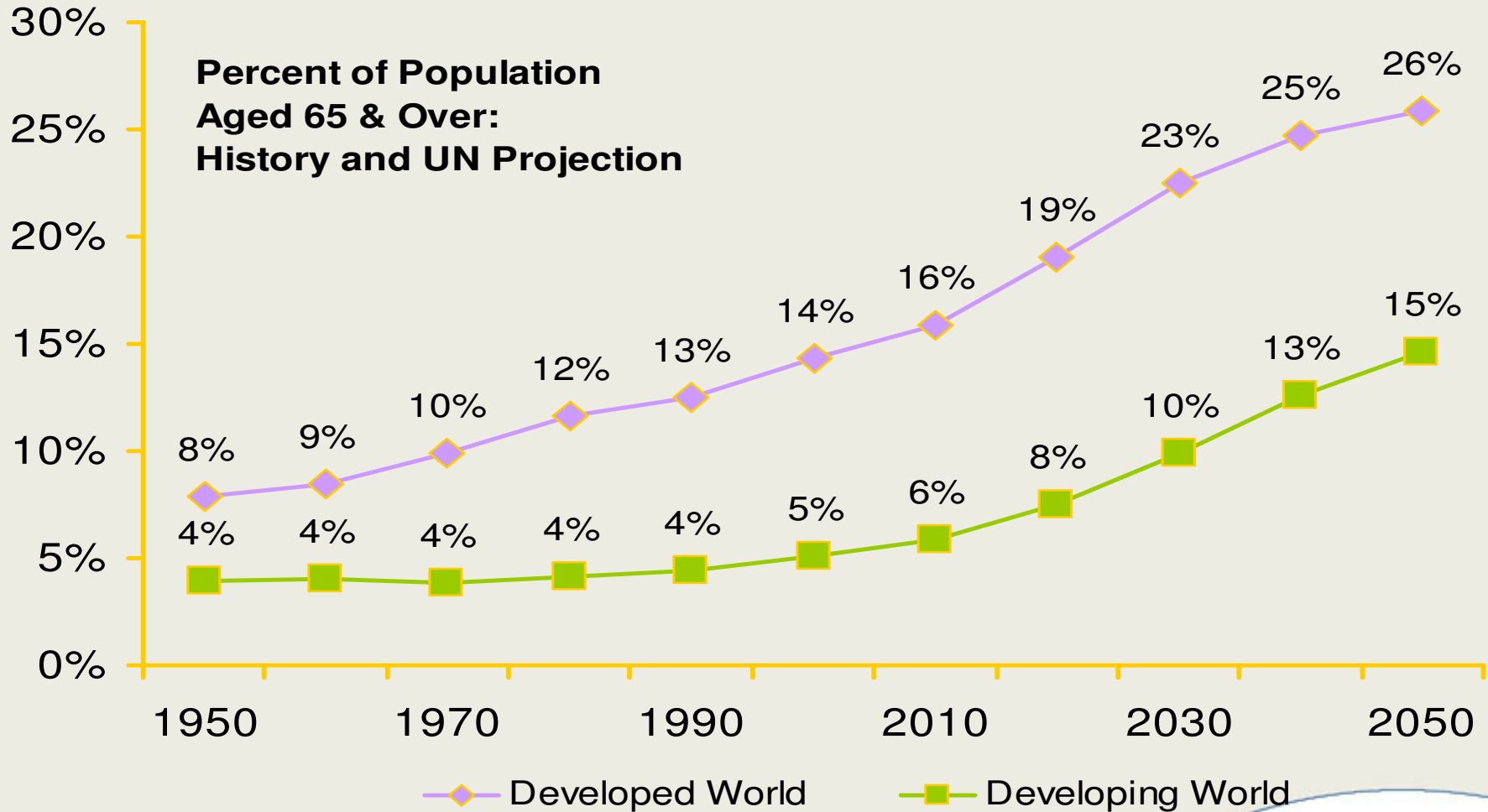
- **A transition from infectious disease to chronic, degenerative, or man-made diseases as the primary causes of mortality.**

Dramatic improvement in health in the 20th century...

Life Expectancy (years)



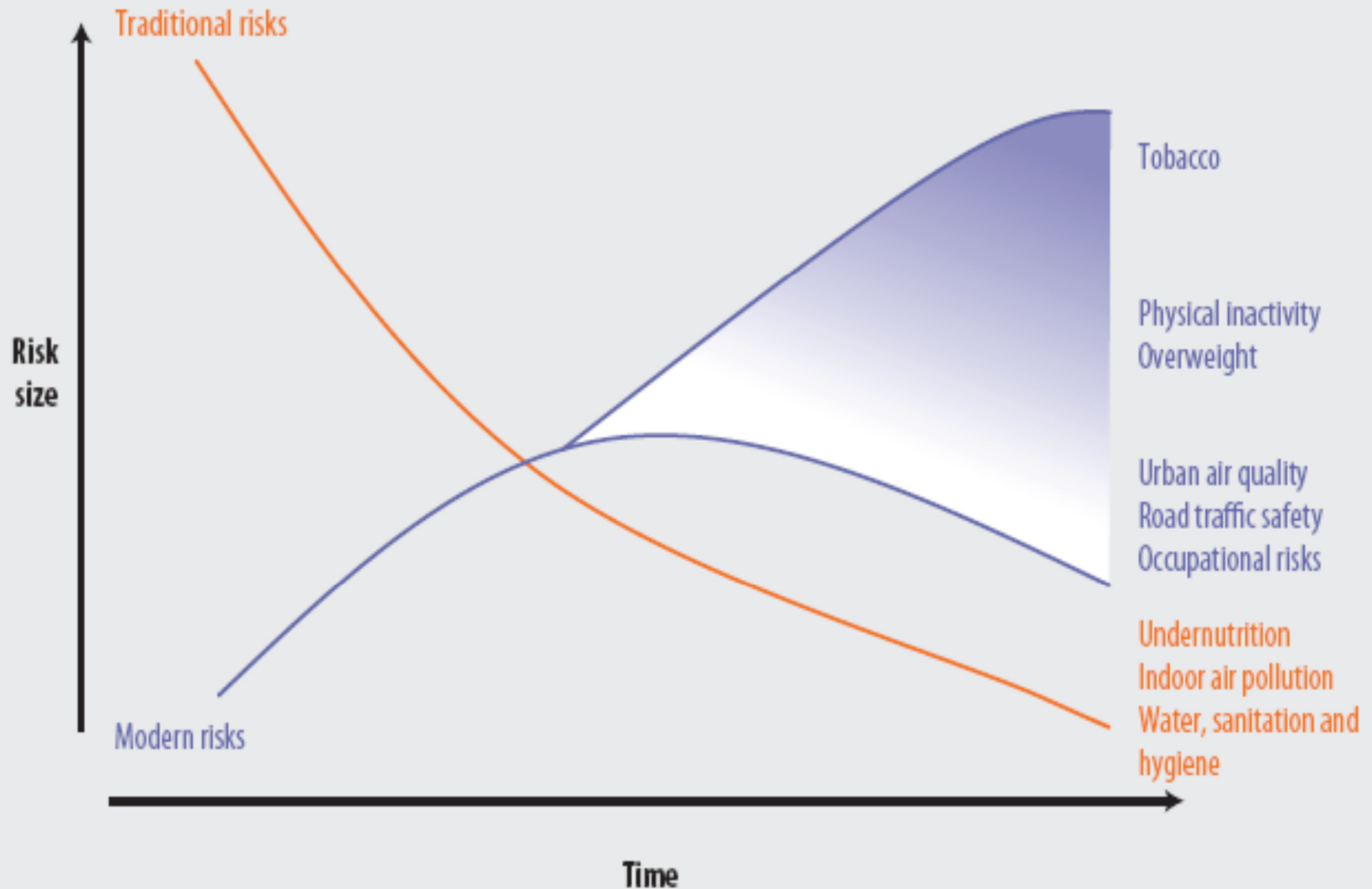
Trends in Global Ageing



Source: UN (2005)

Social science that makes a difference

Health risk transition



3) The Behavioural Transition

An increase in individual and collective behaviours, promoted and spread by global communication (media, sports, TV, cinema, social pressure, increased affluence, urbanization) that leads to the increased prevalence of unwanted health outcomes.

The behavioural transition has led to an increase in “communicated diseases.”

Communicable/Communicated Diseases

AGENTS

- Communicable:**
- **Micro organisms**
 - viruses
 - bacteria
 - parasites

- Communicated:**
- **Food**
 - **Drink**
 - **Tobacco**
 - **Inactivity**

Communicable/Communicated Diseases

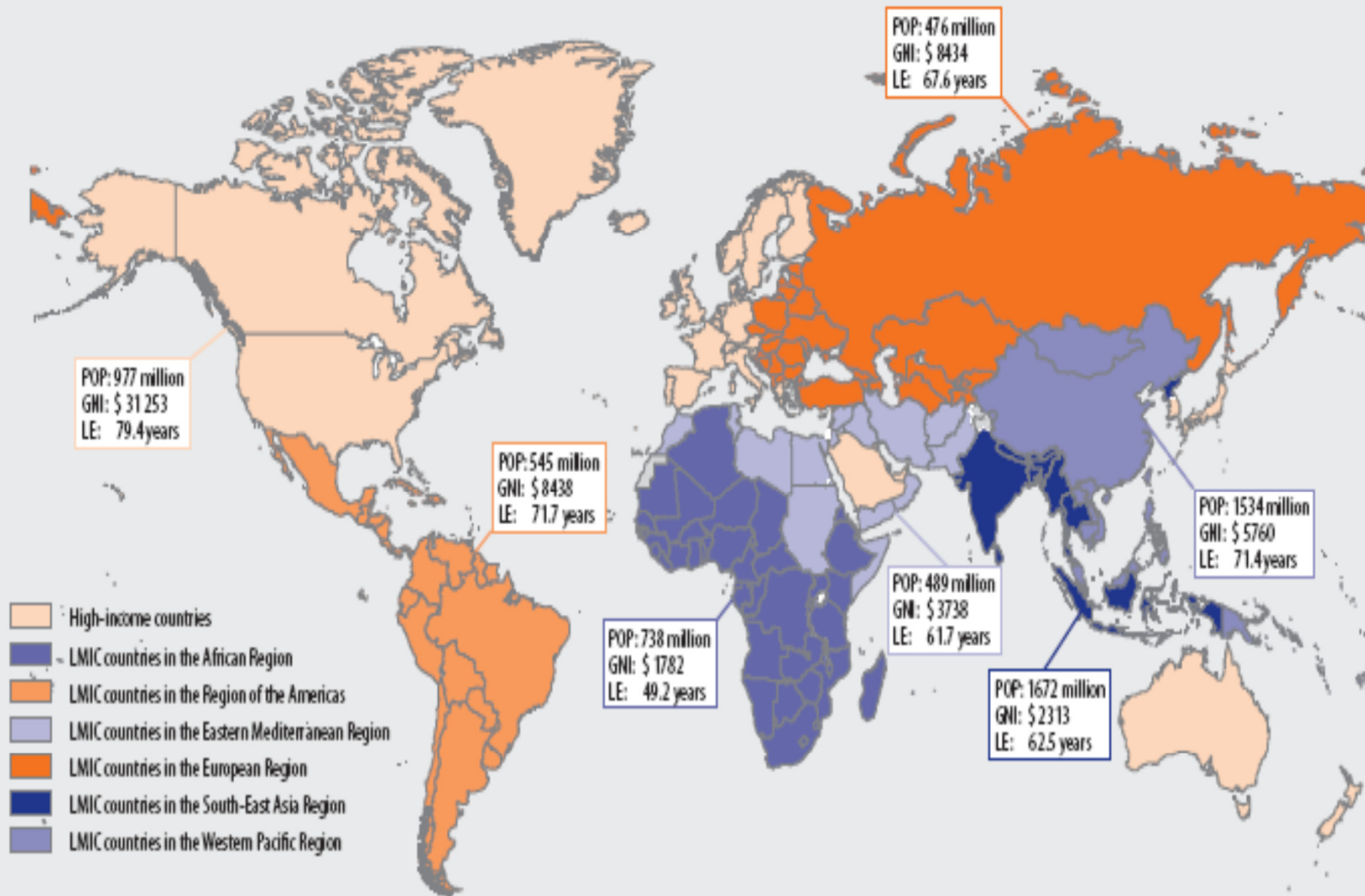
Communicable:

Vectors

- **Insects**

Communicated:

- **Media**
- **Sports**
- **TV/Cinema**
- **Social pressure**



POP, population; **GNI**, gross national income per capita (international dollars); **LE**, life expectancy at birth;
LMIC, low- and middle-income countries.

Table 1: Ranking of selected risk factors: 10 leading risk factor causes of death by income group, 2004

Source: WHO (2009). Global health risks: mortality and burden of disease attributable to selected major risks. Geneva: WHO. Reprinted with permission from WHO.

Low-income countries			Middle income countries		
Rank	Risk factor	Death in millions (% of total)	Rank	Risk factor	Death in millions (% of total)
1	Childhood underweight	2.0 (7.8)	1	High blood pressure	4.2 (17.2)
2	High blood pressure	2.0 (7.5)	2	Tobacco use	2.6 (10.8)
3	Unsafe sex	1.7 (6.6)	3	Overweight and obesity	1.6 (6.7)
4	Unsafe water, sanitation, hygiene	1.6 (6.1)	4	Physical inactivity	1.6 (6.6)
5	High blood glucose	1.3 (4.9)	5	Alcohol use	1.6 (6.4)
6	Indoor smoke from solid fuels	1.3 (4.8)	6	High blood glucose	1.5 (6.3)
7	Tobacco use	1.0 (3.7)	7	High cholesterol	1.3 (5.2)
8	Physical inactivity	1.0 (3.8)	8	Low fruit and vegetable intake	0.9 (3.9)
9	Suboptimal breast feeding	1.0 (3.7)	9	Indoor smoke from solid fuels	0.7 (2.8)
10	High cholesterol	0.9 (3.4)	10	Urban outdoor air pollution	0.7 (2.8)

Table 2: Ranking of selected risk factors: 10 leading risk factor causes of DALYs by income group, 2004

Source: WHO (2009). Global health risks: mortality and burden of disease attributable to selected major risks. Geneva: WHO. Reprinted with permission from WHO.

Low-income countries			Middle income countries		
Rank	Risk factor	DALYs in millions (% of total)	Rank	Risk factor	DALYs in millions (% of total)
1	Childhood underweight	82 (9.9)	1	Alcohol use	44 (7.6)
2	Unsafe water, sanitation, hygiene	53 (6.3)	2	High blood pressure	31 (5.4)
3	Unsafe sex	52 (6.2)	3	Tobacco use	31 (5.4)
4	Suboptimal breast feeding	34 (4.1)	4	Overweight and obesity	21 (3.6)
5	Indoor smoke from solid fuels	33 (4.0)	5	High blood glucose	20 (3.4)
6	Vitamin A deficiency	20 (2.4)	6	Unsafe sex	17 (3.0)
7	High blood pressure	18 (2.2)	7	Physical inactivity	16 (2.7)
8	Alcohol use	18 (2.1)	8	High cholesterol	14 (2.5)
9	High blood glucose	16 (1.9)	9	Occupational risks	14 (2.3)
10	Zinc deficiency	14 (1.7)	10	Unsafe water,	11 (2.0)

Table 3: Leading causes of burden of disease (DALYs), countries grouped by income, 2004

Source: WHO (2008) The global burden of disease: 2004 update. Geneva: WHO. Reprinted with permission from WHO.

Low-income countries			Middle income countries		
Rank	Disease or injury	DALYs in millions (% of total)	Rank	Disease or injury	DALYs in millions (% of total)
1	Lower respiratory infections	76.9 (9.3)	1	Unipolar depressive disorders	29.0 (5.1)
2	Diarrheal diseases	59.2 (7.2)	2	Ischaemic heart disease	28.9 (5.0)
3	HIV/AIDS	42.9 (5.2)	3	Cerebrovascular disease	27.5 (4.8)
4	Malaria	32.8 (4.0)	4	Road traffic accidents	21.4 (3.7)
5	Prematurity and low birth weight	32.1 (3.9)	5	Lower respiratory infections	16.3 (2.8)
6	Neonatal infections and other ^a	31.4 (3.8)	6	Chronic obstructive pulmonary disease	16.1 (2.8)
7	Birth asphyxia and birth trauma	29.9 (3.6)	7	HIV/AIDS	15.0 (2.6)
8	Unipolar depressive disorders	26.5 (3.2)	8	Alcohol use disorders	14.9 (2.6)
9	Ischaemic heart disease	26.0 (3.1)	9	Refractive errors	13.7 (2.4)
10	Tuberculosis	22.4 (2.7)	10	Diarrheal diseases	13.1 (2.3)

3. Other diet-related risk factors & physical inactivity

- High blood pressure
- High blood glucose
- High cholesterol
- Overweight and obesity
- Low fruit and vegetable intake
- Physical inactivity
- Salt intake



Source: <http://jat.esmartweb.com/china-2004/china-2004.htm>

Social science that makes a d



At just 5 years old, Malri Twalib is obese. Community health workers spotted his weight problem last year during a health monitoring activity, in his village in Kilimanjaro, United Republic of Tanzania.

His mother Fadela, herself obese, wasn't aware of the increased risk of chronic disease associated with little Malri's sedentary life and a diet high in animal fats.

Fortunately with the intervention of health workers Malri is being encouraged to eat more fruit and vegetables and spend more time playing outside.

- 22 million children under 5 years are overweight.
- Deaths from chronic disease are forecast to increase by 17% in the next 10 years.

Evidence in support of dietary intervention

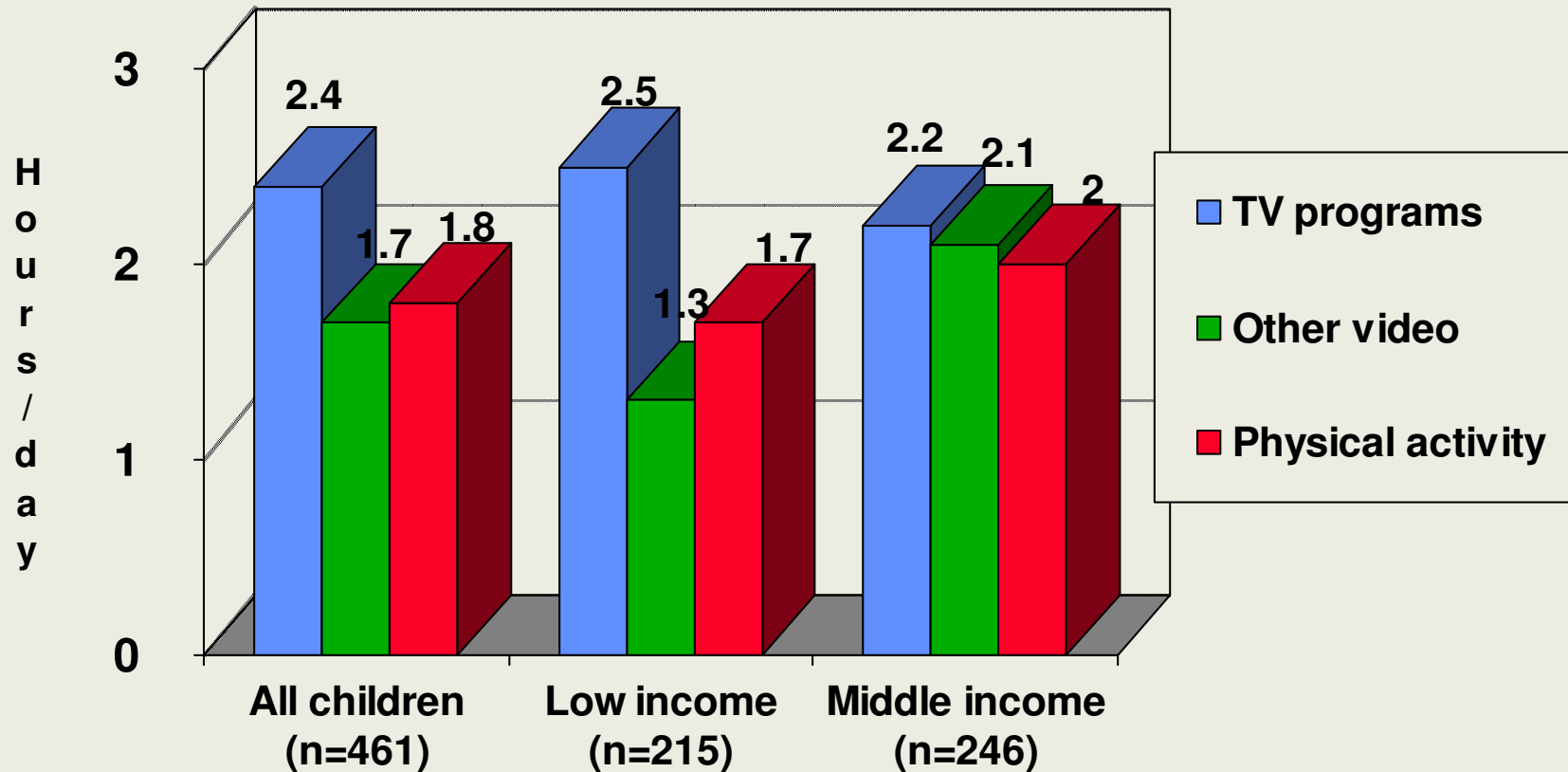
Intervention level	High-income countries		Low and middle income countries	
	Evidence	Level of evidence*	Evidence	Level of evidence*
Population	Legislating reduction of salt in processed food and salt contents labeling (He and MacGregor 2010)	1	Mauritius (Uusitalo et al. 1996)	2
	Nutrition labels (Variyam 2008)	2		
	Pricing strategies (fiscal policies) (WHO 2009b)	1		
	Point-of-purchase prompts in grocery stores, vending machines, cafeterias and restaurants to support healthier choices (Swinburn et al. 2004; Matson-Koffman et al. 2005; Pomerleau et al. 2005; WHO 2009b)	3		
Regulating food advertising (Swinburn et al. 2004; Cecchini et al. 2010)	2	Micronesia (Kaufer et al. 2010)	3	
Mass media campaigns (Matson-Koffman et al. 2005; Pomerleau et al. 2005)	3			
Community	Community interventions [salt reduction](He and MacGregor (2010)	1	China [salt reduction](Tian et al. 1995)	2
	Diet education (WHO 2009b)	2/3	Pakistan [cooking fats, salt](Aziz et al. 2003); Brazil [F&V] (Jaime et al. 2007)	3
	School-based interventions (De Sa and Lock 2007; [prevent obesity] (Brown and Summerbell 2009; WHO 2009b);	2	China (Hu et al. 2010); India (Singhal et al. 2010)	3
	Garden-based youth nutrition intervention (Robinson-O'Brien et al. 2009)	3		
Worksite interventions (Engbers et al. 2005; Pomerleau et al. 2005; Ni Mhurchu et al. 2010; WHO 2009b)	2/3	Chile (Leighton et al. 2009)	3	
Religious setting interventions (Pomerleau et al. 2005; WHO 2009b)	2/3			
Individual	Primary care interventions (Ammerman et al. 2002; Oude Luttikhuis et al. 2009; Pignone et al. 2003; WHO 2009b; Dodd et al. 2010; Sargent et al. 2010)	2	India (Singh et al. 1992) Brazil (Sarotelli et al. 2005); China (Liu et al. 2009)	3
	-Lower intensity (Hooper et al. 2009; Brunner et al. 2009)	3		
	-Medium/high intensity (United States Preventive Services Task Force 2003)	1		
	Internet-based interventions (Enwald and Huotari 2010)	2		
	Family-based intervention (Epstein et al. 2008; Birch and Ventura 2009; Ciampa et al. 2010)	3		
Telephone-based interventions (Eakin et al. 2007)	2			

*Levels of evidence: 1=good evidence; 2=emerging or promising evidence; 3=mixed evidence; 4=no evidence



Social science that makes a difference

Mean Time dedicated to video viewing and physical activity, Mexico City Children 9-16 years old 1999



Ref: Mexico Nutrition Survey 1999

Social science that makes a difference

Evidence in support of physical activity interventions

	High-income countries		Low and middle income countries	
Intervention level	Evidence	Level of evidence*	Evidence	Level of evidence*
Population	Policy and environment (Saelens and Handy 2008; WHO 2004; WHO 2009b)	2	Columbia (Gomez et al. 2004)	3
	Mass media interventions (Finlay and Faulkner 2005; Wakefield et al. 2010)	3	Brazil (Matsudo et al. 2002)	3
Community	Community interventions (WHO 2009b; Yang et al. 2010)	2	Columbia (Gámez et al. 2006); Iran (Pazoki et al. 2007)	3
	School-based programmes (Brown and Summerbell 2009; Dobbins et al. 2009; Harris et al. 2009; Jepson et al. 2010)	2	Latinamerica (Hoehner et al. 2008; Ribeiro et al. 2010); China (Liu et al. 2008); Chile (Kain et al. 2004; Bonhauser et al. 2005); Thailand (Mo-Suwan et al. 1998)	2
	Worksite interventions (Conn et al. 2009; Groeneveld et al. 2010; Verweij et al. 2010)	2	South Africa (Skaal 2010)	3
	Group interventions (Conn et al. 2003); Physical activity interventions for older adults (Van der Bij et al. 2002)	3	South Africa (Kolbe-Alexander et al 2006)	3
Individual	Health care setting interventions (Hillsdon et al. 2005; Bratava et al. 2007; Hudon et al. 2008; Oude Luttikhuis et al. 2009; Dodd et al. 2010; Lee et al. 2010)	2	Brazil (Santos et al. 2005)	3
	Telephone counselling (Eakin et al. 2007)	2		
	Internet-based physical activity interventions (Van den Berg et al. 2007)	2		
	Engaging parents to increase youth physical activity (O'Connor et al. 2009)	3		

*Levels of evidence: 1=good evidence; 2=emerging or promising evidence; 3=mixed evidence; 4=no evidence

Evidence in support of multiple risk factor interventions

	High-income countries		Low and middle income countries	
Intervention level	Evidence	Level of evidence*	Evidence	Level of evidence*
Population	Population-based prevention (WHO 2004, 2010) Environmental policies (Willett et al. 2006) Policy interventions implemented through sporting organisations for promoting healthy behaviour change (Priest et al. 2008)	2 3 4	Population-based prevention (WHO 2004, 2010); Thailand (WHO 2010); Mauritius (Dowse et al. 1995)	3
	Mass media interventions [diet & PA] (Wakefield et al. 2010)	2		
Community	Community interventions (Shea and Basch 1990; Gaziano et al. 2007)	1	South Africa (Rossouw et al. 1993) Russia [diet, PA, smoking](Alexandrov et al. 1992)	2
	School-based programmes [Diet,PA] (Brown and Summerbell 2009; Summerbell et al. 2009)	2/3	China [Diet, PA] (Jiang et al. 2007); Chile [Diet,PA] (Kain et al. 2009)	2
	Work site intervention [Diet,PA] (Verweij et al. 2010)	2	India (Prabhakaran et al. 2009)	2
	Religious setting intervention (Yanek et al. 2001)	2		
	Group interventions [Diet, PA, Behaviour change] (Lombard et al. 2009b)	2		
Individual	Health care setting intervention (Anorim Adegboye et al. 2007; Beaglehole et al. 2008; Fleming and Godwin 2008; Brown et al. 2009; Ebrahim et al. 2009; Horton 2009; Angermayr et al. 2010); [smoking and risky/harmful alcohol use] (Goldstein et al. 2004)	2	Brazil (de Mello et al. 2004); India (Rachachandran et al. 2006); China (Li et al. 2008)	1/2
	Psychological interventions (Oude Luttikhuis et al. 2009; Whitlock et al. 2006, 2010)	1	Columbia (Castro et al. 1983)	3
	Telephone delivered intervention (Eakin et al. 2009)	2		
	Family-based intervention (Epstein et al. 1998; Ebbeling et al. 2002; Ciampa et al. 2010)	3	China (Jiang et al. 2005)	3

*Levels of evidence: 1=good evidence; 2=emerging or promising evidence; 3=mixed evidence; 4=no evidence