Economic dimensions of NCDs Region of the Americas - Overview

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Introduction

What are we worried about?

I. Public health approach is insufficient: Macro and micro economic evidence needed to justify public health policy interventions (market failures)

II. Need to capture indirect costs of NCD burdens as well as macroeconomic and fiscal impact of interventions.

III. The solutioni needs to be multisectoral: What are countires of the Region doing?

IV. How to solve methodological and data availability gaps (información es bien público)

V. Identify and evaluate impact of most effective, cost-efffective and **equitable** interventions.

I. The Global Burden of NCDS and risk factors

The burden of NCDs and risk factors

- NCDs are the first mortality and morbidity in both men and women in practically all countries of the Americas (except Haiti) and keeps growing.
- NCDs and their associated risk factors are a “democratic” burden: affect population of all ages, gender, ethnic, income level; but they reproduce inequalities.
- NCDs treatment component represents the highest burden in health costs.
- Good news: NCDs and most of their risk factors are preventable. How?
- First (political) step:

NCDs a global epidemic

36 MILLION people die annually from NCDs.

63% of all global deaths are due to NCDs.

4 X 4 Four types of noncommunicable diseases – cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases – make the largest contribution to mortality in the majority of countries. These four NCDs are largely preventable by means of interventions that tackle four risk factors for NCDs: tobacco use, unhealthy diets, physical inactivity, and harmful use of alcohol.

9 MILLION people die too young from NCDs (before the age of 60).

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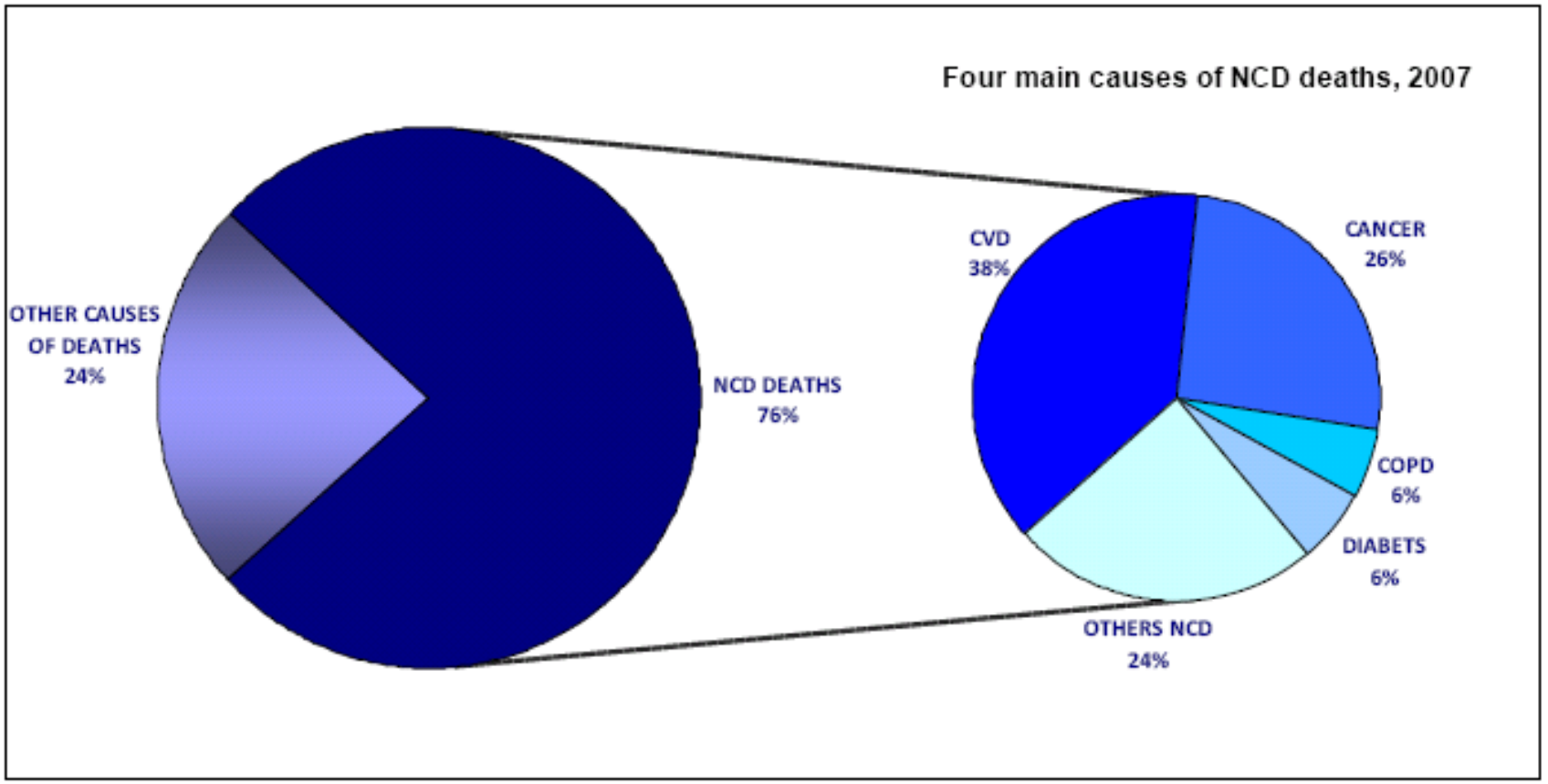
90% of these premature deaths due to NCDs occur in developing countries.

58% (6%) premature deaths among women due to NCDs range from as high as 58%, in low-income countries, to as low as 6%, in high-income countries, leading to growing inequalities between countries and populations.

Out of 5.1 million deaths in the Region of the Americas in 2007, 3.9 million (77%) were due to NCDs

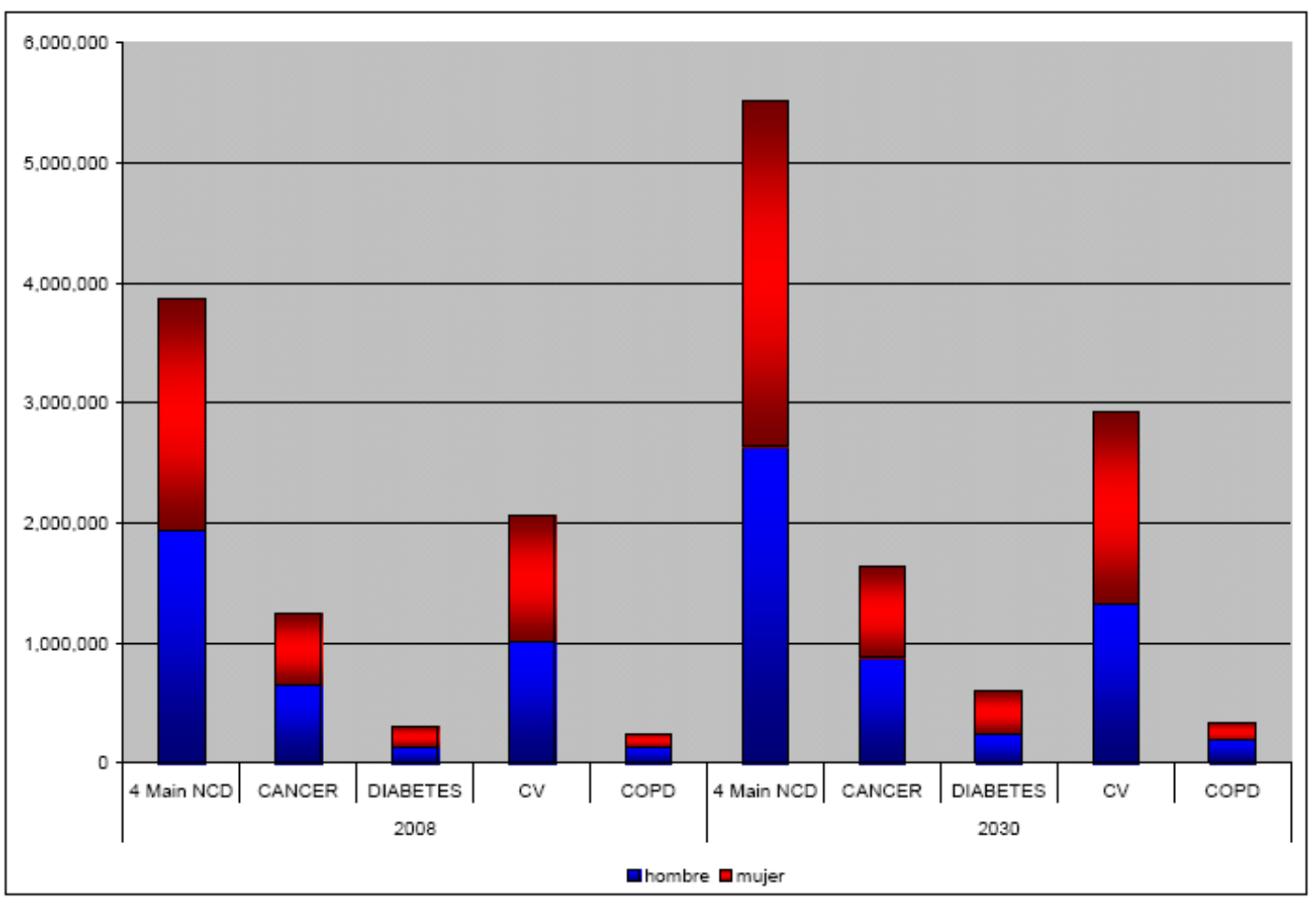
Mortality by cause of death in the Americas (2007)



Source: data from the PAHO Health Information and Analysis Project, 2010

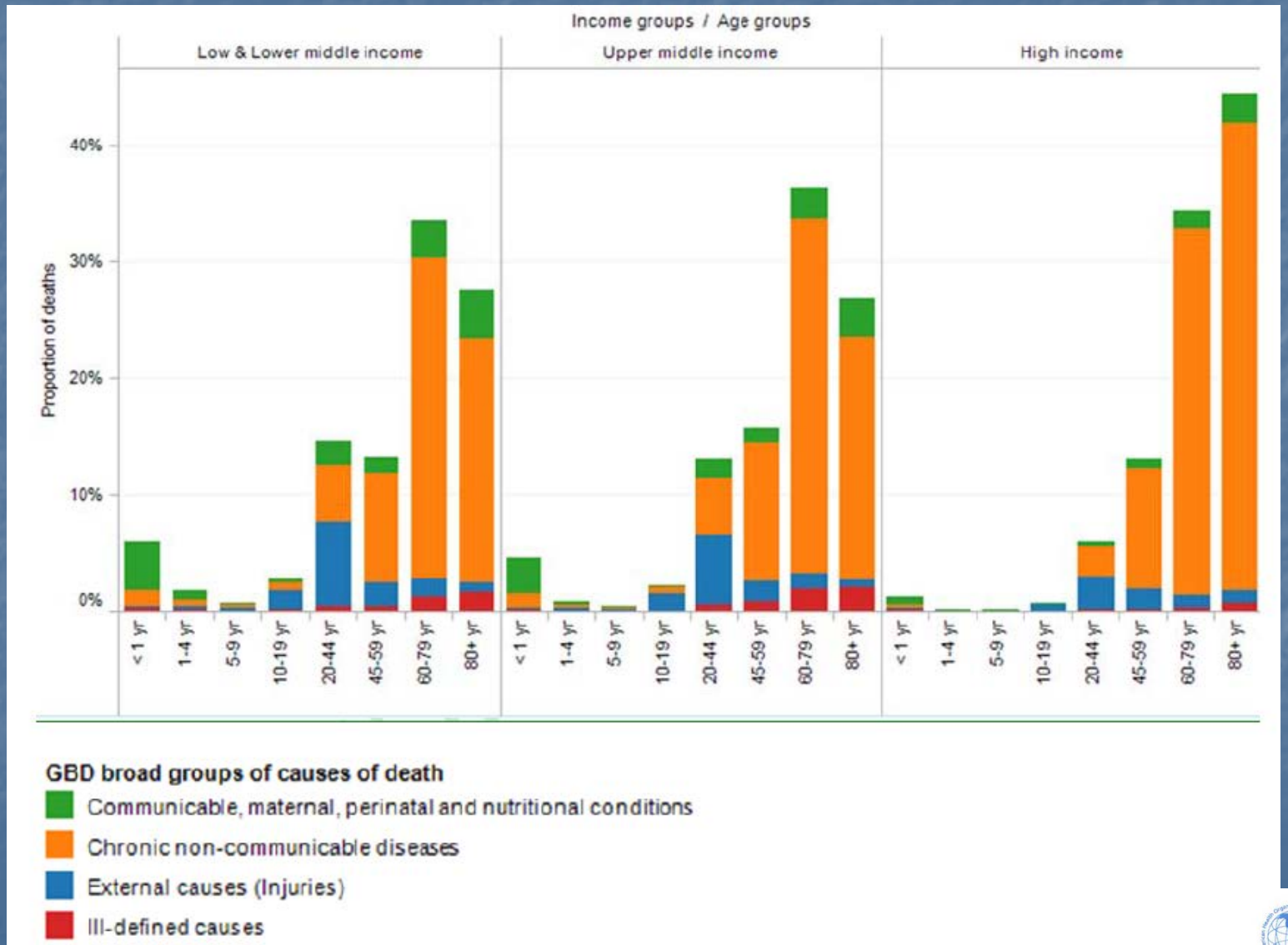
Projections indicate a substantial increase in deaths from NCDs between 2008 and 2030

Mortality by cause of death in the Americas (2007)



Source: Based on 2010 WHO Global Burden of Disease mortality projections

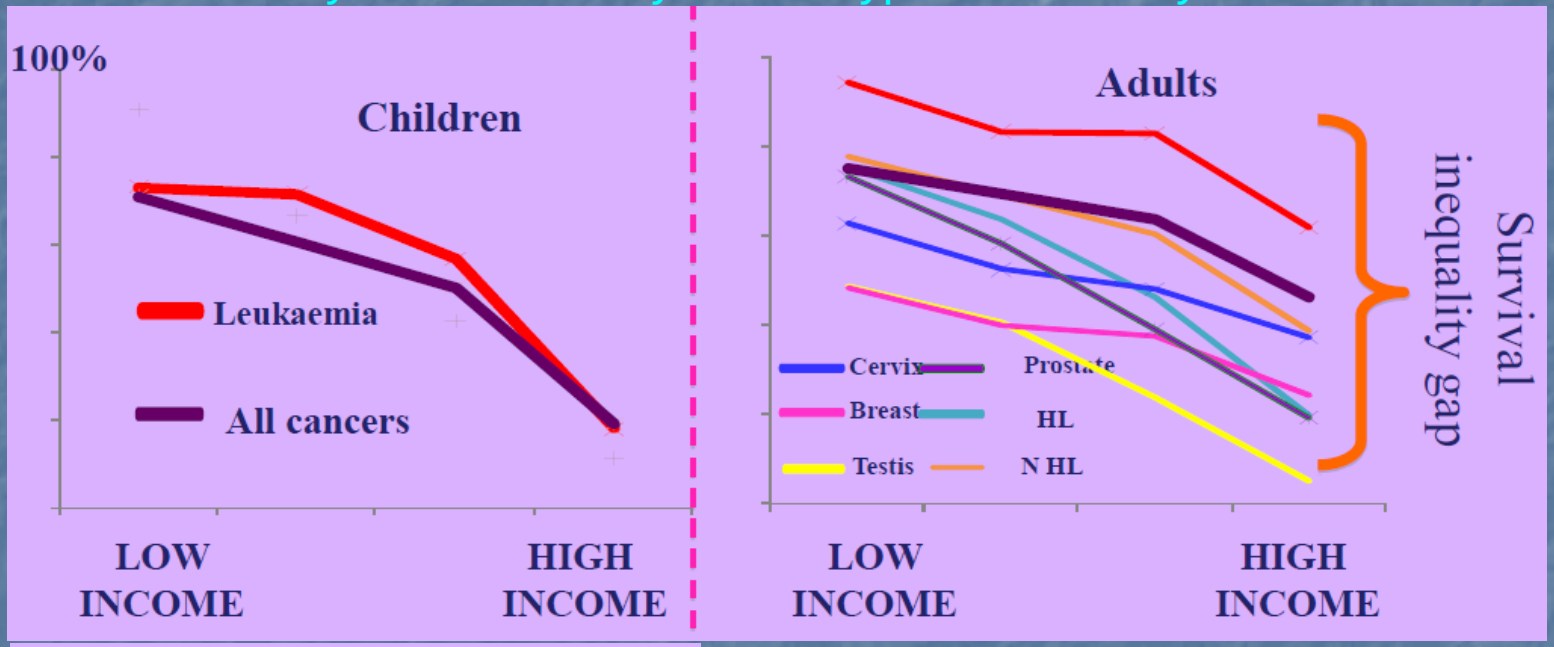
NCDs are affecting younger populations in low and middle income countries



Source: Regional Health Observatory (PAHO), 2010

NCDs also reproduce health inequalities

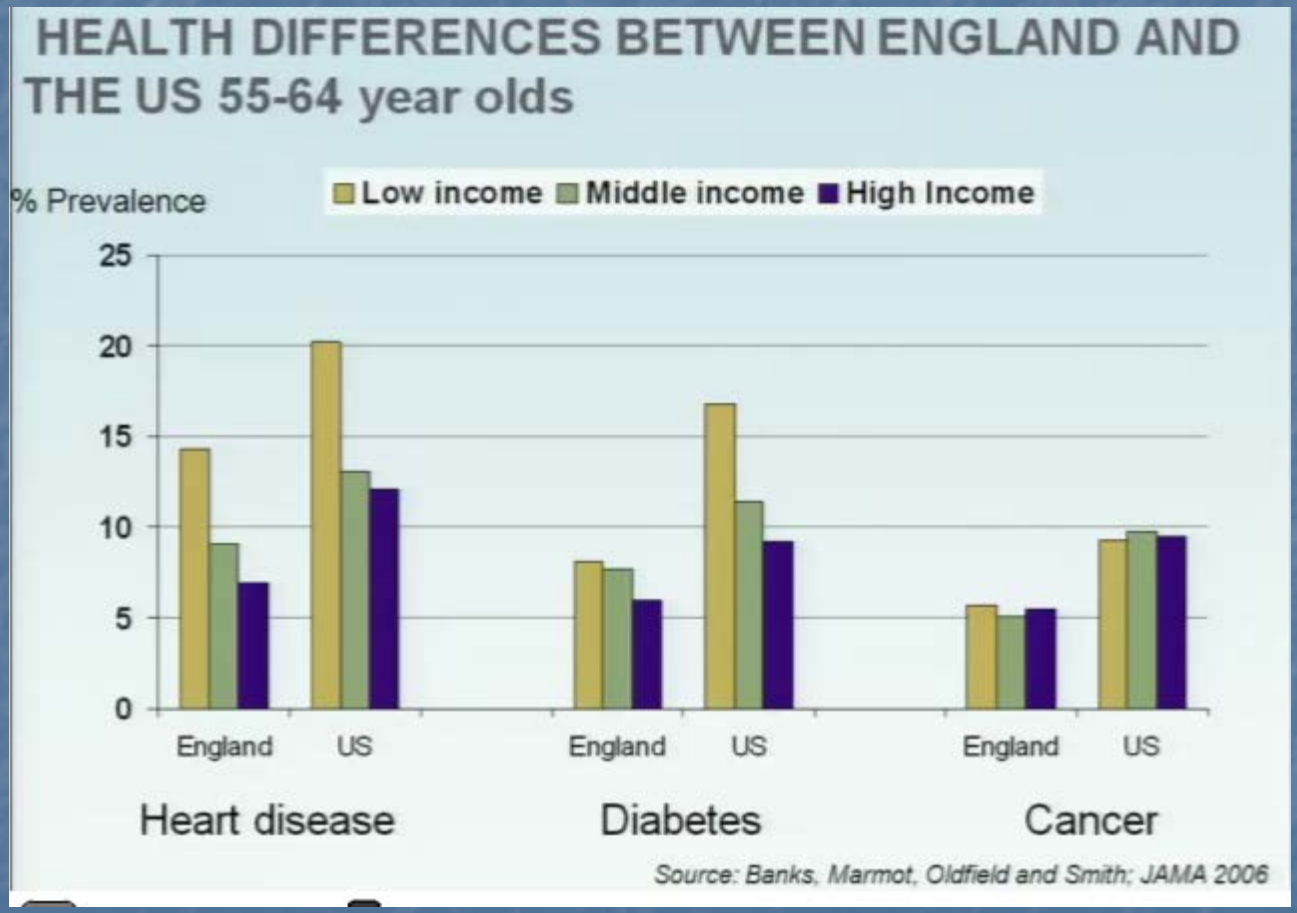
Mortality and income by cancer type and country income*



Source: Knaul, Arreola, Mendez. estimates based on IARC, Globocan, 2010.

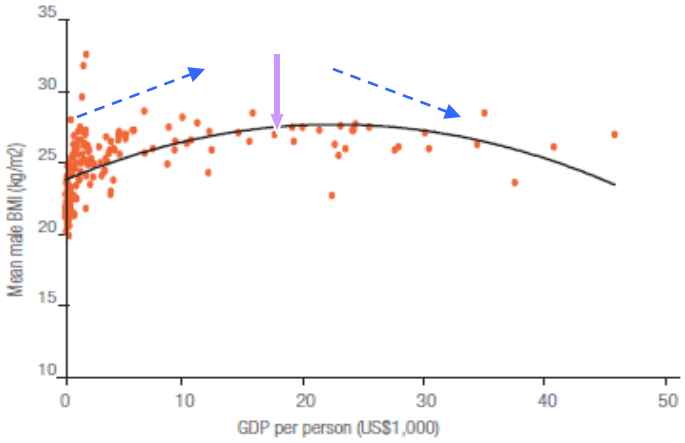
* Presented at the Global Health Council 38th Annual Conference 2011.

Differences also reproduce at high income level countries



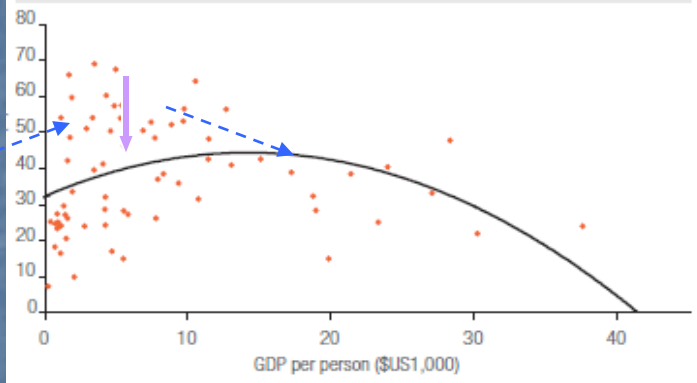
NCDs risk factors also represent a threat for the poor

Figure 4 Mean body mass index (BMI) versus gross domestic product (GDP) per person (2002)



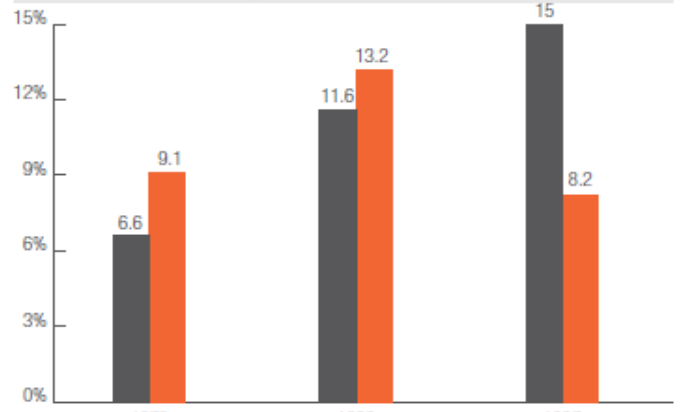
Source WHO Global InfoBase (http://www.who.int/ncd_surveillance/infobase; accessed 14 July 2006)
Note The sample comprises 170 countries and the robust regression results are: Male BMI = 23.7 + 0.35 GDPpc - 0.0078 $(GDPpc)^2$ (R^2=0.29). The coefficients are significant at the 1% level.

Figure 6 Smoking prevalence among men (age > 14) versus gross domestic product (GDP) per person (2002)



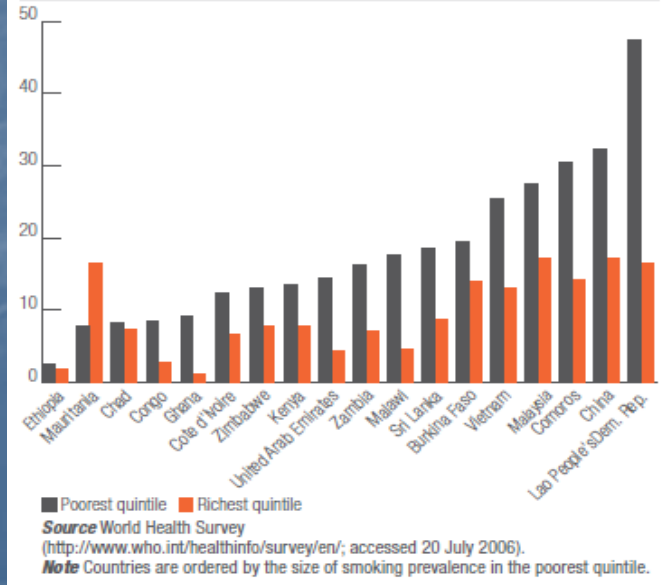
Source WHO World Health Statistics 2006 (http://www.who.int/whosis/whostat2006/en/index.html; accessed 16 September 2006).
Note The sample comprises 69 countries and the robust regression results are: Male smoking prevalence = 31.8 + 1.72 GDPpc - 0.060 $(GDPpc)^2$ (R^2=0.11). The coefficients are significant at the 1% level.

Figure 8 Obesity prevalence amoung women from south-eastern Brazil, 1975–1997



Source Monteiro et al. (2000)

Figure 7 Prevalence of daily smokers in the poorest and richest income quintiles in selected low- and middle-income countries



Source World Health Survey (http://www.who.int/healthinfo/survey/en/; accessed 20 July 2006).
Note Countries are ordered by the size of smoking prevalence in the poorest quintile.

Source: Suhrcke, et.al. OHA, 2006

II. Economic Dimensions of NCDS and risk factors in the Region of the Americas

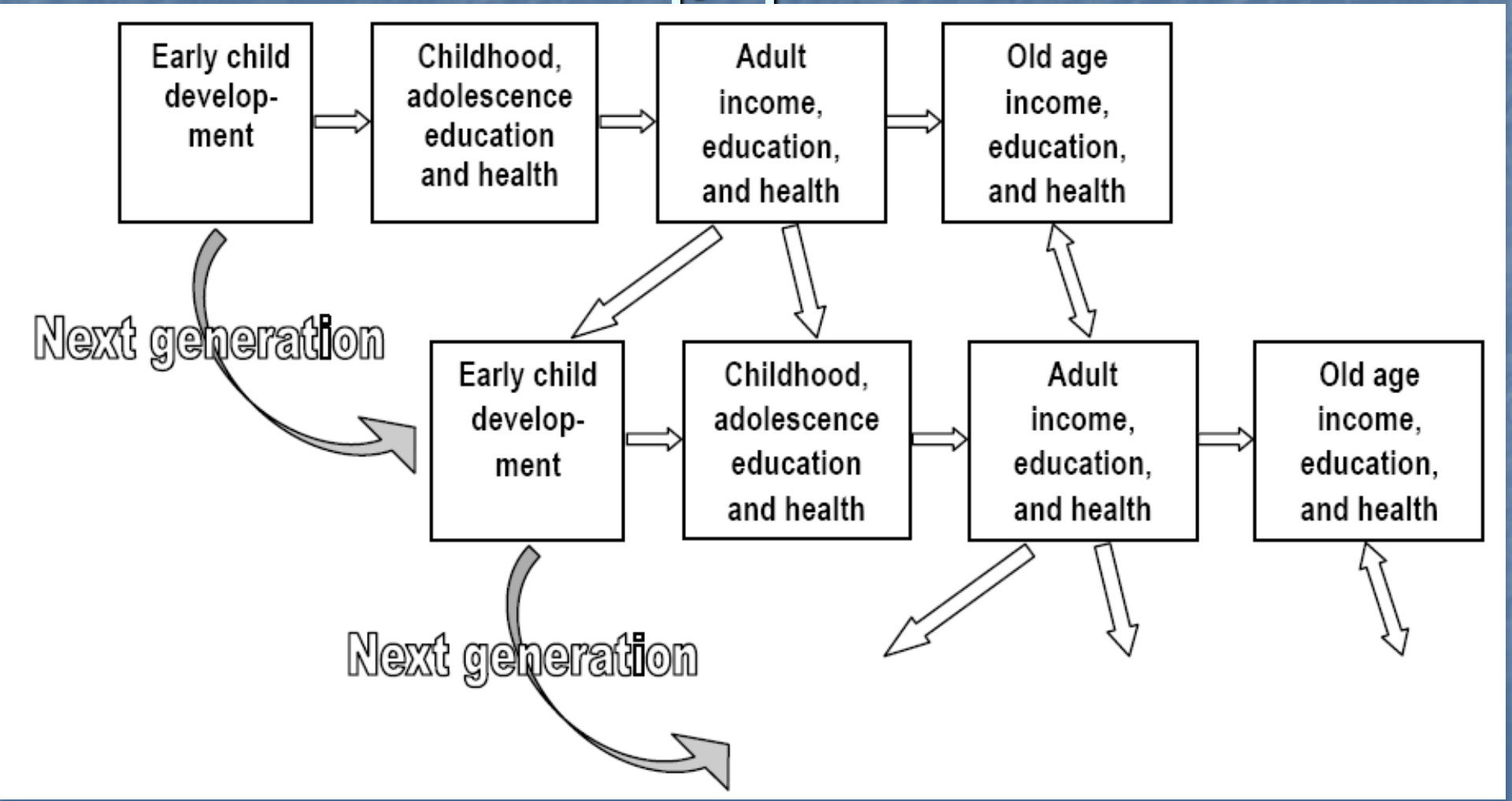
The Economic Story:

aging and epidemiologic transition

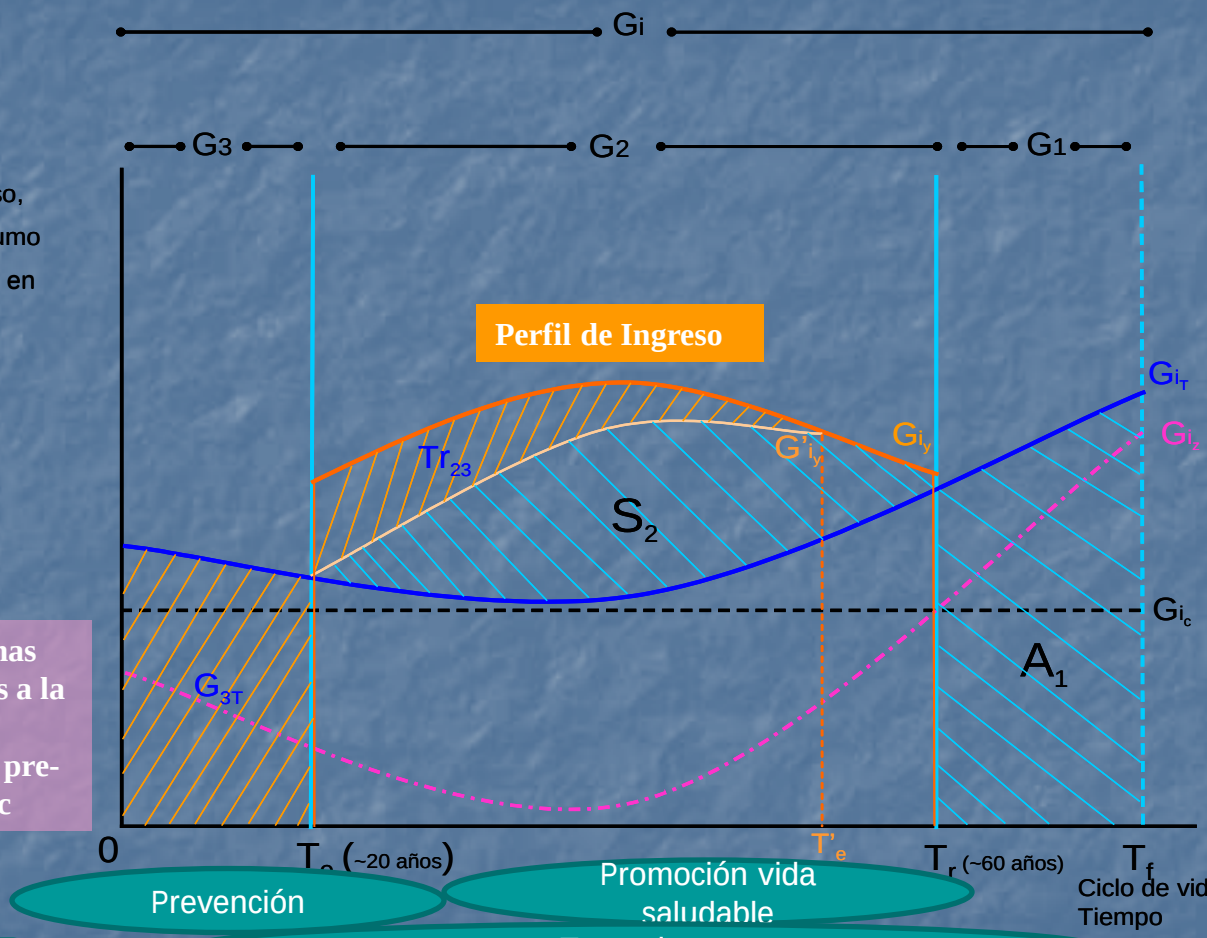
Economic activity varies by age.
(The Generational Economy)

Shifts in age structure impact the economy.

NCD impacts work through intergenerational and life cycle



Correspondence b/w life cycle, income profile, expenditure and consumption (and health programs)



Programas dirigidos al adulto mayor:

- Envejecimiento & Cuidados de largo plazo

– Enfermedades crónicas

Perfil de Gasto -Consumo

Programas dirigidos a la ninez, cuidado pre-natal, etc

Políticas Públicas

Políticas Públicas

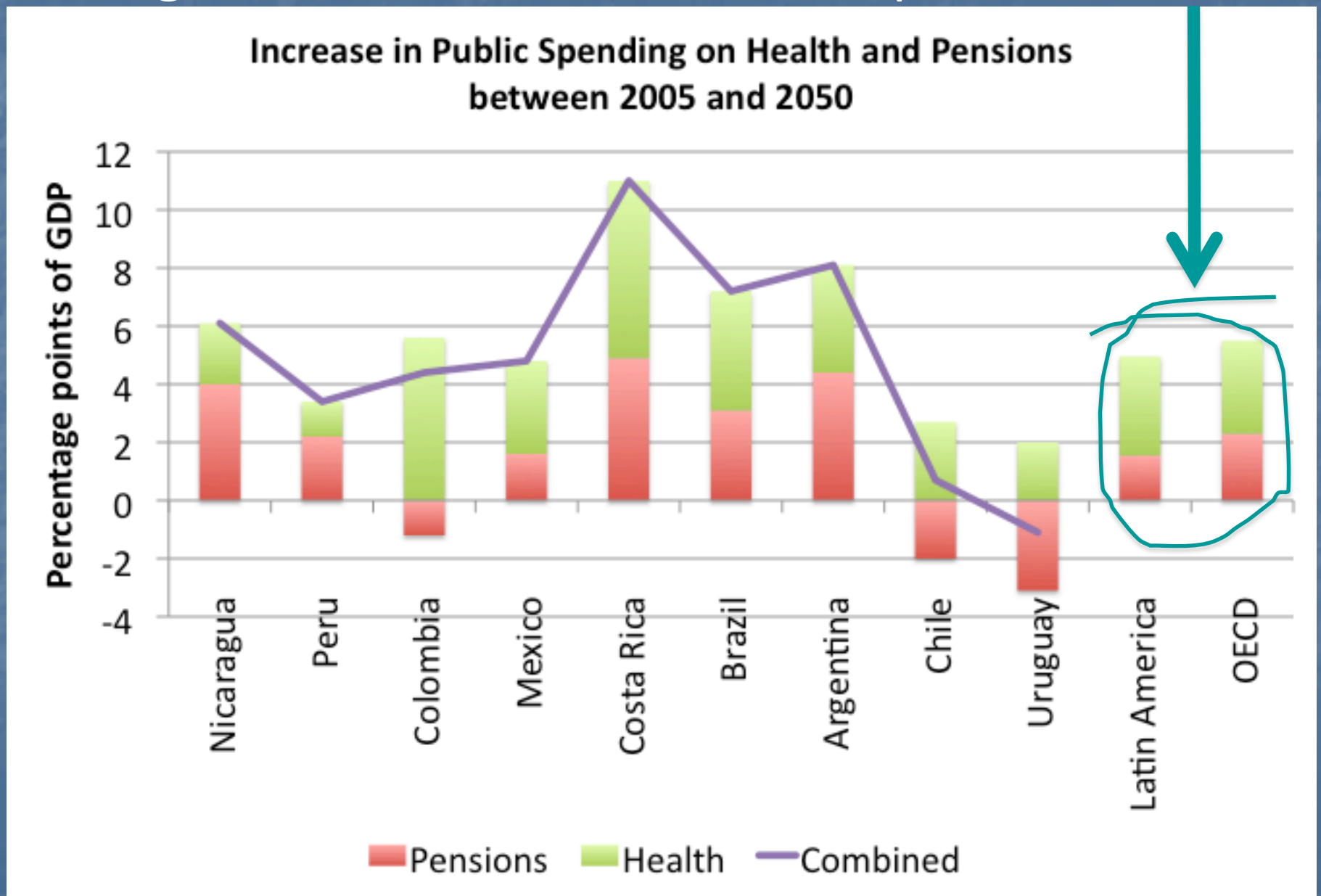
Programas específicos que afecten diferentes etapas del ciclo de vida (salud materno infantil, salud adolescente, --enfermedades crónicas ?, etc.)

Organización Panamericana de la Salud
Oficina Regional de la Organización Mundial de la Salud

Where can we find this economic data by age?

- The National Transfers Account Project aims to measure the economic impact of population aging .
- Applies the same methodology of measuring economic activity by age to countries around the world. Currently, 36 countries.
- Project is directed by Ronald Lee (UC Berkeley) and Andrew Mason (East-West Center).
- ECLAC is the regional coordinator, supported with a grant from Canada's IDRC.

Fiscal impact of population aging likely to be as large in Latin America as in European Union.



III. What has been done to measure economic impact?

Measuring the economic burden of NCDs: methods and data sources used

- Available studies in two perspectives: costs and benefit.
- Very few available for developing countries: quantifying these impacts is a research priority.

COST perspective

-"Cost of illness" : direct (medical) and indirect (productivity losses and foregone income) costs

-"Microeconomic": at individual and household level (catastrophic health events impact on savings and consumption; labor supply and productivity; education and human capital accumulation)

-"Macroeconomic": aggregate D and S; key macro variables; link with long-term economic growth

-"Fiscal": aggregate revenue and spending; fiscal deficit; public debt and sustainability

BENEFIT perspective

-"cost effectiveness"
-"cost-benefit"

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Some common models used

- Cost of illness (COI): direct (diagnosis, treatment, and care) and indirect costs (invisible: non-medical and non-personal costs --loss of productivity and income; pain and suffering)= total social costs
- Value of lost output or economic growth approach: impact on aggregate GDP through labor, capital and other factors. (e.g. WHO's EPIC model)
- Value of statistical life (VSL) or full-income approach: places an economic value on the loss of health (or life) for the individual and evaluates the individual's "willingness to pay" to reduce that risk of disability or death.

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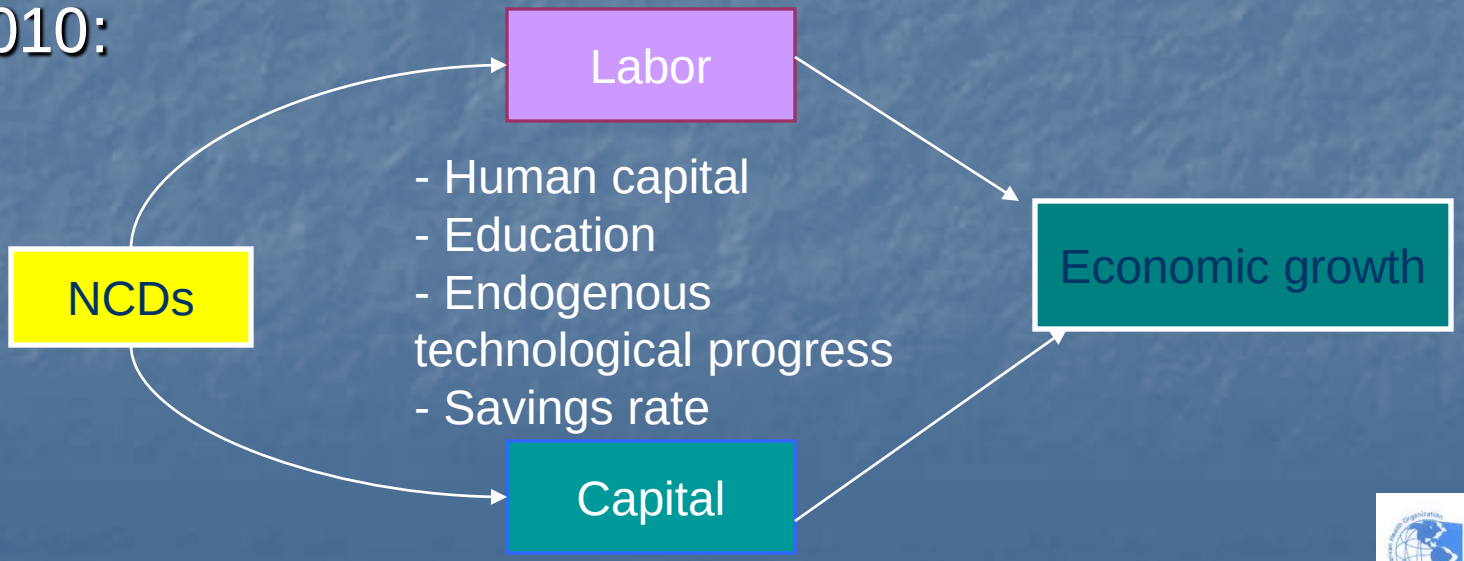
Macroeconomic approach

- Some few studies address the long-term relationship between NCDs and economic growth.
- Available evidence at the global level suggests that each 10% rise in NCDs is associated with a 0.5% lower rate of annual economic growth. WHO, Global status report on noncommunicable diseases 2010
- Harvard-WEF model estimates lost output at 5% of GDP in 2010:



General Equilibrium Model approach

- GE theory is a branch of theoretical economics. It seeks to explain the behaviour of supply, demand and prices in the whole economy with several or many markets
- A situation where all markets in an economy are simultaneously in equilibrium.

Structure of GTAP

- The basic structure of the Global Trade Analysis Project (GTAP) model includes: industrial sectors, households, governments, and global sectors across countries.
- Countries and regions in the world economy are linked together through trade.
- Prices and quantities are simultaneously determined in both factor markets and commodity markets.
- Five main factors of production are included in the model: labour (skilled and unskilled), capital, natural resources and land.

Conclusions

- Having Canadians adopt a “Healthy Diet” would require an increase in the consumption of fruits and vegetables and dairy products and a reduction in our consumption of meat.
- The impact of adopting a “Healthy Diet” for Canada is positive for all indicators: GDP, industrial output, and welfare.
- This occurs because the positive economic impact of increased fruit and vegetable and dairy products consumption is greater than the negative economic impact of decreased meat consumption.

Conclusions (Con't)

- The economic impact on industrial sectors varies depending upon the scenario being analyzed.
- As expected, the fruit and vegetable primary agricultural sector and the dairy product sector experience positive benefits.
- While the meat products and primary livestock sectors experience negative impacts.
- The crop growing sectors; wheat, cereal grains, oilseeds, and other crops, all experience negative growth rates when compared to the business as usual case.
- Other sectors, such as light manufacturing, petroleum and coal industries, chemical and rubber, plastics industries, and transportation have experienced positive growth.

Conclusions (Con't)

- A suitable portfolio of fiscal policies is needed to provide the incentives for household consumption to change their consumption patterns towards a healthy diet.
- The impact of having Canadians consume a healthy diet would be a reduction in the amount of nutrition related chronic diseases. Recently, questions have been raised about which policies would be the best to address the issues of healthy eating.
- Policies being considered by governments include both consumption taxes and subsidies for healthy alternatives.
- For example, government can encourage the consumption of fruits and vegetables by providing a subsidy for these commodities.

The economic burden of NCDs: some results

- Estimates from cost-of-illness studies show that the cost of NCDs and risk factors range between 0.02% and 6.77% of a country's annual GDP. Behrman JR, et.al. (2009).
- A multicountry study on the economic burden of diabetes, showed total costs as a portion of GDP ranging from 1.8% in Venezuela to 5.9% in Barbados. Barceló A et al. (2003)
- A recent review of 33 studies developed in the US 1992-2008 estimated that direct medical costs of obesity and overweight are very heterogeneous and may account for 5% to 10% of total health expenditures in the United States. Tsai, A.G. et.al. (2010)
- In the province of Alberta, Canada, a study showed that costs attributable to overweight and obese status in 2005 represented 5.6% of the total direct and indirect costs for all health care expenditures. Mofatt E, et.al. (2011)

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Microeconomic approach studies

- Mainly COI studies.
- Evidence found on the effects of NCDs on labor market outcomes, (including wages, earnings, workforce participation, hours worked, retirement, and job turnover) in specific populations: individuals and households.
- Indirect costs represent main threat: impact on labor force and on human capital accumulation.
- Most extensive research in US and Canada: nationwide studies based on national longitudinal surveys and databases.

Table 1: Economic burden by chronic disease, in the Pan-American region (US$ millions)

Country	Disease	Total	Direct costs	Indirect costs	Indirect / Direct	Year estimated	Source	Key information
United States	Cancer			115,800		2000	Bradley, et.al (2008)	Does not include productivity lost due to morbidity or disability.
				232,400		2000	Bradley, et.al (2008)	Includes earnings lost due to caregiving and household activity.
								Does not include productivity lost due to morbidity or disability.
				960,600			Yabroff (2008)	Used the Willingness to Pay Approach
		96,126	27,458	68,668	2.50	1990	Brown & Fintor (1995)	
		319,000	48,000	271,000	5.65	2003	Dewel & Bedrossian (2007)	
	Diabetes	132,000	27,000	105,000	3.89	2003	"	
	Hypertension	313,000	33,000	280,000	8.48	2003	"	
	Heart disease	170,000	65,000	105,000	1.62	2003	"	
	Diabetes	174,000	116,000	58,000	0.50	2007	American Diabetes Assoc. (2008)	
		153,000	116,000	37,000	0.32	2002, in 2007	"	
Canada	Diabetes	4,756	3,478	1,277	0.37	1998	Dawson (1998)	Indirect costs include estimated costs for undiagnosed diabetes, but it does not include costs on disability (only mortality costs).
Brazil	CVD	10,512	4,709	5,803	1.23	2004	Reinert Azambuja et.al (2008)	Considers only severe cases of CVD
Mexico	Diabetes		2,618			1998	Villareal-Rios et.al. (2000)	
		15,118	1,974	13,144	6.66	2000	Barceló, et.al.	See footnote 1
	Hypertension	2,486	1,179	1,307	1.11	2007	Arredondo & Zuniga (2006)	Only public institutions
		4,479	1,963	2,516	1.28	2001	Villareal (2002)	
Cuba	Diabetes	1,347	722	624	0.86	2000	Barceló, et.al.	See footnote 1
Dominican R.		625	226	399	1.77			
Haiti		79	48	31	0.64			
Bahamas		149	11	138	12.91			
Barbados		151	13	138	10.81			
Guyana		36	20	16	0.78			
Jamaica		410	136	273	2.01			
Trinidad/Tobago		285	38	247	6.49			
Costa Rica		473	97	377	3.90			
El Salvador		500	137	362	2.64			
Guatemala		841	291	550	1.89			
Honduras		240	114	126	1.11			
Nicaragua		129	85	44	0.52			
Panama		435	104	330	3.16			
Argentina		10,935	747	10,188	13.64			
Bolivia		228	86	142	1.66			
Brazil		22,604	3,952	18,652	4.72			
Chile		2,418	295	2,123	7.20			
Colombia		2,587	415	2,172	5.23			
Ecuador		599	233	365	1.56			
Paraguay		218	72	146	2.03			
Peru		1,844	502	1,342	2.67			
Uruguay		775	95	680	7.19			
Venezuela		2,194	308	1,886	6.13			

1/ Some variables in the estimation were obtained from a single country, and then extrapolated to other countries with similar levels of GDP per capita. Thus, some variables are constant across countries. Possible underestimation of direct costs.

Source: http://new.paho.org/hq/dmdocuments/2011/15_Chronic_Diseases_JorgeUgaz.pdf

Some methodological issues

- The micro and macroeconomic interlinkages of NCDs and their risk factors are complex and not easy to identify by using traditional methods or common surveys.
- Establishing causality is a challenge because of "endogeneity" problems: e.g. medical expenditures on NCDs treatment and impoverishment; labor market impact of NCDs; households ' coping strategies: assets and savings reduction/depletion?
- Possible solutions: new econometric techniques (two-stages models); production of longitudinal databases; compilation of health and socioeconomic data; etc.

IV. Some interventions: What works?

NCD 'Best Buys': $9/Bn/yr investment for developing world to implement (WHO, 2011)

Condition	Interventions
Tobacco use	Tax increases; smoke-free indoor workplaces & public places; health information / warnings; advertising/promotion bans
Alcohol use	Tax increases; restrict retail access; advertising bans
Unhealthy diet & physical inactivity	Reduced salt intake; replacement of trans fat; public awareness about diet & physical activity
CVD & diabetes	Counseling & multi-drug therapy (including glycaemia control for diabetes) for people with >30% CVD risk (including those with CVD); treatment of heart attacks with aspirin
Cancer	Hepatitis B immunization to prevent liver cancer; screening & treatment of pre-cancerous lesions to prevent cervical cancer

Many Good Buys: tobacco cessation counseling, alcohol screening and short interventions, diabetic foot care…

Some examples

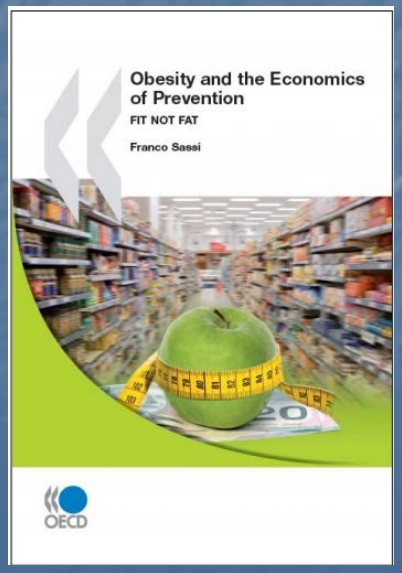
- Bahamas poverty funding (IDB $7.5 mlln loan):
  - Background:
    - One out of every four children in grade 10 is obese
    - Two out of every three Bahamians between the ages of 21 and 60 years of age are now overweight or obese
  - Innovative approach: Conditional Cash Transfer (CCT) program toward health promotion strategies and activities.
  - Objective: reduce children's BMI index through behavioral changes, improving educational achievement and a healthier lifestyle
  - Target population: children from poor households
  - Comment: incentive to individuals

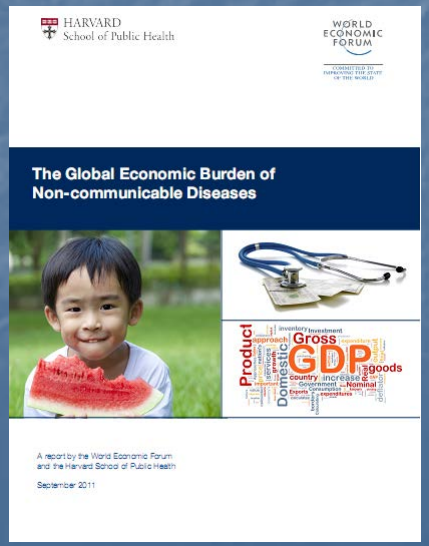
V. The Way Forward: Goals and Actions

Workshop on Economics of NCDs and risk factors
Mexico D.F., Mexico
November 14 – 15, 2011

Work plan 2012-2013

- Technical Group (PAHO/WHO, OECD, McGill, ECLAC)
- DCP3 section related
- Training activities U of W / Q Univ





Remaining challenges

- Need for further research and for more systematized evidence on the economic and welfare impact of NCDs on individuals, households and societies (link with socioeconomic data).
- Few evidence available on the impacts on health care systems and government budgets (fiscal impact).
- Impact on household income, coping strategies, and long-term care (unpaid work) is almost inexistent in the literature for NCDs.
- How to engage other sectors?: NCDs not only a “health” problem.

Key questions for future work (TN)

- What are the obstacles, in terms of methodology and availability of information, to estimate the net impact of NCDs on economic variables?
- What characteristics (variables, conditions) do data collection methods need to consider in order to capture these effects? What statistical methods are most appropriate for the purpose?
- What are the direct and indirect costs incurred by national health systems as a result of NCDs?
- Is there an association between the magnitude of the impact and the structure of the model of care?
- What are the implications of potential cost increases from the rising prevalence of NCDs in the Region for the financing and structure of health systems?
- What are the links between NCDs on the one hand, and development, economic growth rates and human capital accumulation (e.g., lost productivity due to disability, decline in labor supply, premature mortality, etc.) on the other?
- What are the long-term advantages of investing to expand prevention measures to achieve overall improvements in health?

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Many thanks!

Obrigada!

Merci!

Muchas gracias!

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Pan American Health Organization
Regional Office of the World Health Organization