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Economic Development and Non-Communicable Chronic Diseases

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Abstract

This article outlines the economics of non communicable chronic diseases (NCDs), necessary for designing evidence-based health policies to reduce the prevalence of NCDs. The main risk factors of NCDs are manmade: abuse of alcohol, tobacco, junk food, and lack of exercise. Hence we define an economic category of analysis, unwholesome goods. The analysis tackles the two dimensions of NCDs: individual and collective. The first one linked to how much NCDs are a result of consumer's choice and the second one, the recognition that NCDs are result of a complex interrelated environment at the society level, evidencing the need for a multisectoral approach. An economic analysis includes the study of 1) NCD in the context of intergenerational life cycle dynamics; 2) demand, supply, externalities, and political economy of NCD factors; 3) the incidence of lifestyle risks according to socioeconomic status, and changes under the impact of economic growth and the demographic transition. Where do the different countries lie on the development pathway? How much of the burden lies on the individual and on the collective dimensions of NCDs? What are the most effective policies for immediate application tackling both, the individual and collective dimensions? To what extent are households affected by financial catastrophe and impoverishment due to NCDs? What are the essential requirements for the health systems to respond with efficiency and efficacy to the NCDs phenomenon? Policy and research initiatives include health sector capability for NCDs, prevention of NCD factors, promotion of multisectoral approaches, and a comprehensive data initiative. Conclusions point to the need to simultaneously implement health policy and construct the necessary evidence bases. A comprehensive data initiative is proposed as needed in addition to expanding data availability in tandem with policy implementation. Finally an initiative is proposed to formulate sufficiently effective multisectoral policies and to establish the necessary links between the health sector and other sectors involved.

Resumen

Este artículo esboza el contenido requerido por un análisis económico de las enfermedades crónicas no transmisibles (ENT) que tenga como objeto diseñar políticas públicas de salud respaldadas en evidenciapara reducir la prevalencia de estas enfermedades. Los principales factores de riesgo de las ENT son decisiones como abusar del alcohol, del tabaco, consumir en exceso comida chatarra, y falta de ejercicio. Por ello definimos una categoría económica de análisis, bienes malsanos. Nuestro análisis aborda las dimensiones individual y colectiva de las ENT. La dimensión individual estudia qué tanto las ENT son el resultado de la elección del consumidor. La dimensión colectiva reconoce que las ENT resultan de un complejo entorno social que requiere de un enfoque multisectorial. Un análisis económico suficiente requiere el estudio de 1) *las ENT en el contexto de la dinámica del ciclo intergeneracional de la vida;* 2) *demanda, oferta, externalidades y economía política de los factores de riesgo de las ENT;* 3) *y de la incidencia de los factores de riesgos por niveles socioeconómicos. También debe incluir el análisis de cambios debidos al impacto del crecimiento económico y de la transición demográfica. ¿En qué punto del proceso de desarrollo se encuentran los diferentes países? ¿Qué tanto de la carga de las ENT recae sobre los individuos y qué tanto sobre la dimensión colectiva? ¿Cuáles son las políticas más eficaces, de aplicación inmediata, para hacer frente a ambas dimensiones, individual y colectiva? ¿A qué grado enfrentan los hogares empobrecimiento y catástrofe financiera debido a las ENT? ¿Cuáles son los requisitos esenciales para que los sistemas de salud respondan con eficiencia y efectividad al las ENT? Las iniciativas de política e investigación deben considerar la capacidad del sector salud en cuanto a ENT, prevención de los factores de las ENT, promoción de enfoques multisectoriales, y una iniciativa integral de estadística sobre las mismas. Nuestras conclusiones apuntan a la necesidad de implementar simultáneamente las políticas de salud y de la construcción de las bases de datos necesarias para su evaluación. Se propone una iniciativa integral de información, que complemente la disponibilidad de información que resulte de la implementación de políticas. Por último, se propone una iniciativa para formular políticas multisectoriales suficientemente eficaces y establecer los vínculos necesarios entre el sector salud y los otros sectores involucrados.*

Introduction

The objective of this paper is to examine the economic dimensions involved in evidence-based health policies for reducing the prevalence of non-communicable chronic diseases (NCDs) and their risk factors in the Region of the Americas. The aim is to give a broad outline of the economics of NCDs, ranging from risk factors and health costs to long-term economic growth and human development.

The urgency of attending NCDs

We aim to highlight the main factors that can help to position the topic as a priority in the political and public health agendas, and help to prioritize multisectoral policies, at national, sub-regional, and regional level.

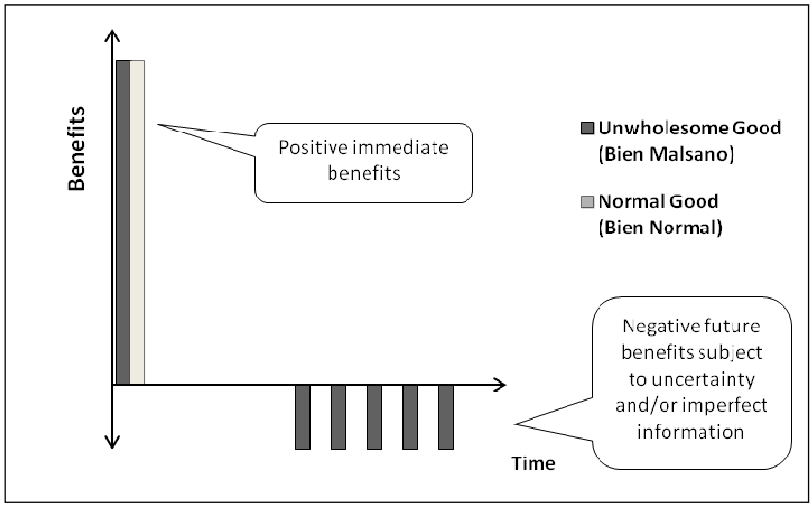
The importance of prioritizing NCDs in the political and public health agendas, as well as of prioritizing multisectoral policies, derives mainly from two factors. The first is the high social and economic costs associated with NCDs. The second is the fact that the main risk factors of NCDs are well known negative manmade impacts of economic sectors producing them as consumption goods or as negative externalities. Thus while the challenge for the health sector is itself formidable, in fact preventive policies are indicated for NCDs, and these require the implementation of public policies to modify the behavior of consumers, producers and urban planners, amongst others.

The prevalence of NCDs thus presents a singular characteristic as compared to infectious and deficiency diseases. This is its relation with unwholesome lifestyles, specifically lifestyles characterized by the consumption of unhealthy food, abuse of alcohol and/or tobacco, and physical inactivity. We thus define an economic category of analysis, unwholesome goods (bienes malsanos in Spanish). These are goods that present an immediate benefit but also long-term, future negative impacts, about which the consumer and even the producer may be uninformed and uncertain (Figure 1). Unwholesome factors are produced for profit or as externalities. They bring up issues of knowledge, responsibility, learning and irrationality in consumption decisions. While it could be rational to consume unwholesome goods, as when soft drinks substitute for potable water, it could also be an irrational result of ignorance, if for example the immediate benefit of replacing lemonade with a soft drink is social status.

In consumer theory, an inferior good is a good whose demand decreases when consumer income rises. Unwholesome goods are inferior in that if at an increased income there is a lower discount rate, then the negative future benefits weigh more and therefore the good is less valuable. Similarly, increased life expectancy may shift an unwholesome good from good to bad,

or at least diminish its worth. Better education or information implying a better knowledge of negative benefits will also diminish the worth of an unwholesome good.[1]

FIGURE 1. DEFINITION. AN UNWHOLESOME GOOD IS ONE THAT HAS AN IMMEDIATE BENEFIT, AS A NORMAL GOOD, BUT ALSO NEGATIVE FUTURE BENEFITS SUBJECT TO UNCERTAINTY AND/OR IMPERFECT INFORMATION



A full economic analysis of NCDs includes consideration of the economics of NCD risk factor production and disease incidence, the economic burden of disease by gender and socioeconomic status, health system costs, and the macroeconomic impacts of NCDs on human capital, labor, saving, government expenditure, retirement costs, and economic growth in general. A long-term perspective is essential for the economic analysis of NCDs.

Summarizing, NCDs represent a much more complex phenomenon than infectious and deficiency diseases. The main risk factors are manmade. Diseases are prevented by individual and social behavioral changes rather than, for example, vaccinations and antibiotics. Morbidity, treatment and care are prolonged and expensive, covering a wide variety of conditions. Implementing cost-effective evidence-based public policies on NCDs represents a formidable challenge. One of the technical obstacles is a lack of systematized evidence, databases, and indicators to serve as elements for the analysis of the evolution and costs of NCDs, as well as the effectiveness of policy initiatives (Pescetto, 2011).

[1] However in terms of policy, education by itself is not enough. It needs to be accompanied by regulation (see http://www.youtube.com/watch?v=BhM6APFzWz8, a presentation Spasoff, 2011).

International Bodies Agenda on NCDs: A Priority

The nature of the difficulties as well as the urgency involved in implementing public policies against NCDs are illustrated by the actions taken by international bodies in this regard.

a. Global Level

At a global level, in 2000 the 53rd World Health Assembly adopted Resolution WHA53/17 on the prevention and control of NCDs, followed by a series of activities on tobacco, diet and physical activity, cancer, alcohol and so on. In 2003 the World Health Organization (WHO) brought to fruition the first treaty negotiated under its auspices. Adopted by the World Health Assembly, the WHO Framework Convention on Tobacco Control (FCTC) entered into force in 2005 and has since become one of the most widely embraced treaties in UN history. As of today it has 174 parties, 120 of which have adopted or strengthened their tobacco control legislation after ratifying the treaty.[2]

The First Ministerial Conference on Healthy Lifestyles and NCD Control, held in Moscow on 28-29 April 2011, the World Conference on Social Determinants of Health held in Rio de Janeiro, Brazil, and the UN General Assembly high-level meeting on NCDs, held in New York on 19–20 September 2011 promoted further action on NCDs.

The above-mentioned 2011 UN General Assembly adopted by consensus the resolution "Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases" (UN, 2011). This resolution focuses particularly on developmental and other challenges and social and economic impacts of NCDs, particularly for developing countries.

b. Regional Level

Non-communicable chronic diseases (NCDs) have been recognized as the greatest cause of premature death and morbidity in Latin America and the Caribbean (LAC) since the 2002 Pan American Sanitary Conference. According to 2007 estimates, 76% of LAC deaths were related to NCDs, 60% of these to the principal NCDs; PAHO also estimates that some 250 million people are living with a NCD (Pescetto, 2011). Moreover, the burden of NCDs is expected to rise significantly in the following decades, to around 4% of global GDP, enough wealth to eradicate two dollar-a-day poverty (Bloom et al, 2011). The fiscal costs are expected to be higher than retirement costs (Olusoji, Robles &

[2] Cited from http://www.who.int/fctc/en/index.html. See also http://www.globalissues.org/article/533/tobacco, both read 12/15/2011.

Smith, 2007). Chronic diseases pose huge long-term costs in health care, whether provided by families or health systems. They also have a disproportionate impact on poor and vulnerable populations. They imply a huge organizational and technological challenge to health systems. Finally, they are a growing threat to economic development, both because of the direct health and health care impacts and because of indirect costs in long-term human capital formation and returns.

Recognizing the need to address NCDS, PAHO has developed a Regional Strategy and Plan of Action[3] (PAHO, 2007), which aims at preventing and reducing the NCD burden and related risk factors in the Americas. This strategy is currently under revision after the findings and recommendations made during the High Level Summit of United Nations in September 2011.

PAHO's original Regional Strategy consisted of four interdependent and complementary lines of action that underline the need to:

1) Prioritize NCDS in the political and public health agendas;
2) Implement surveillance of the diseases;
3) Reorient health systems to respond to chronic conditions;
4) Implement health promotion and disease prevention measures.

PAHO's Regional Strategy considered that countries are now at a critical juncture for reversing this deadly epidemic. Public health policies addressing NCDS need to rise to a level commensurate with present and future disease burdens in this Region. The Regional Strategy is based on the following main findings. First, a series of cost–effective interventions are available to prevent the loss of millions of lives as well as damage to economies. Eliminating the well-known major risk factors of NCDS, unhealthy diets,4 abuse of alcohol, smoking and physical inactivity, would reduce disease prevalence very significantly. Second, one of the challenges faced by the program to reduce NCDS is to reorient LAC's well established health systems to address NCDS. This involves operating at a qualitatively higher technical level. Third, achieving a meaningful impact on NCDS requires a high degree of collaboration from sectors beyond the health sector. For one, poverty, unhealthy environmental conditions, and low education are factors that contribute to NCD prevalence. Moreover, the main NCD risk factors are shaped by economic sectors producing unhealthy food, alcohol and tobacco, as well as by physical inactivity also determined economically.

[3] This section draws liberally from the Regional Strategy document. The word "Region" is used for Latin America and the Caribbean or for the Americas, to distinguish from "region".

[4] The "nutrition transition" is a key factor leading to a rise in prevalent overweight and obesity. Population–based surveys from LAC show that, in 2002, 50% to 60% of adults and 7% to 12% of children less than 5 years of age were overweight or obese (PAHO, 2006). In Chile and Mexico, the 2004 national surveys showed that 15% of adolescents were obese (PAHO, 2006). The prevalence of overweight among adults is 45% and 65% in Canada (Klein–Geltink, Choi and Fry, 2006) and the USA (NCHS, 2006), respectively.

Since 1995 in the Americas PAHO has supported the CARMEN initiative (Conjunto de Acciones para la Reducción y el Manejo de las Enfermedades No Transmisibles; set of actions for the reduction and management of NCDs, http://www.paho.org/English/ad/sde/municipios.htm), modeled on the successful North Karelia and CINDI program in Europe and CANADA. This initiative grew into the CARMEN Network of countries and partners, and was followed by the 2002 PAHO Resolution CSP25/15 on cardiovascular prevention and the 2006 Regional Strategy (mentioned above). A ministerial declaration by Health Ministers of the Americas for prevention and control of NCDs was also signed in March 2011 (PAHO, 2011).

1. Human development and economic growth

In this section we review the first wave of studies on health and economic growth, in which PAHO had an active part. Fogel's (2002) long-term perspective on secular changes in poverty and health, and their impact on economic growth, played an important motivating role.

Then we set the analysis of the epidemiological transition in the context of long-term human development. NCDs were originally understood to be a consequence of rising standards of living and the overcoming infectious diseases. However, we explain how in the presence of unwholesome living styles, an unwholesome and much more burdensome epidemiological transition takes place.

1.1. The first wave of studies on health and economic growth

Interest in the interrelation between health and economic growth was sparked by Nobel Prize winning historical studies by Fogel and Wimmer (1992) and Fogel (1994). They found that a third or even one half of the economic growth in England over the last 200 years is due to improvements in nutrition and health. Arora (2001) found comparable results for seven advanced countries using 100 —to 125— year time series of diverse health indicators. This line of research has concluded that the synergism between technological and physiological improvements has produced a rapid, culturally transmitted form of human evolution that is biological but not genetic, which continues in both rich and developing nations, and is called technophysio evolution by Fogel (2002). The prevalence shift from infectious and deprivation diseases to NCDs can be considered as part of this evolution.

The interrelation between health and economic growth was further researched by the Commission on Macroeconomics and Health (2001), appointed by WHO, in particular Working Group 1 on Health, Economic Growth, and Poverty Reduction (Alleyne and Cohen, 2001). The results recognized that health achievements such as increased life expectancy had a

beneficial impact on economic growth and emphasized investing in health for economic development.

At this time PAHO and IADB conducted a series of studies on the interaction of health and income — the first wave of studies. Mayer (2001) confirmed the long-term impact of health on economic growth for Latin America. However, at that time microeconomic estimates of the interactions between health and income led to much smaller estimates than the long-term macroeconomic impacts (Savedoff and Schultz, 2000). Turning to an intergenerational analysis, Galor and Mayer (2002) showed that deficiencies in basic needs could contribute to a poverty trap in education. Mayer-Foulkes (2008a)[5] built these considerations into a dynamic analysis defining a long-term human development trap and providing a conceptual framework consistent with the following stylized features.

> *1)* Persistent differences in human capital levels across the population, that can define a poverty trap dividing the population into classes.
> *2)* Intergenerational impacts of socioeconomic status on health and education, with a critical role for early child development (ECD).
> *3)* Subsequent rises in the potential levels of health and education, rising in feedback with technological change — technophysio evolution.

The existence of such a development trap was shown for the case of Mexico [ibid]. The quantitative impact found for ECD on adult education and therefore on adult income was commensurate with the long-term macroeconomic impacts of health on economic growth. The critical role of early child development on the correlation of adult health and income is consistent also with the findings of Case, Lubotsky and Paxson (2002)6 and Case, Fertig, and Paxson (2003), which place childhood health at the causal origin of the 'gradient' of adult health along income, using databases for developed countries. The Comisión Mexicana de Macroeconomía y Salud (2007) also emphasized health impacts exacerbating poverty and reducing early child development.

Additional features of the interrelation between health and economic growth are summarized by Bloom and Canning (2008). While health is a direct source of human welfare, it is also an instrument for raising income levels. A number of mechanisms exist through which health can affect income. The main ones are the impact of health on worker productivity, children's education, savings and investment, and on the demographic structure, which itself has impacts on productivity, investment and consumption. As well as the impact of current illness, health may have large effects on prospective

[5] Awarded at different stages of research the 2004 Gold Medal for Research on Development by the Global Development Network and the 2007 Victor Urquidi prize by the Colegio de Mexico.
[6] Awarded the 11th Annual Kenneth J. Arrow Award for the Best Paper in Health Economics.

lifespans and life cycle behavior. Studies suggest there may be a large effect of health and nutrition in utero, and in the first few years of life, on physical and cognitive development and economic success as an adult. Macroeconomic evidence for an effect on growth is mixed, with evidence of a large effect in some studies. However, there is a possibility that gains from health may be outweighed by the effect of increased survival on population growth, until a fertility transition occurs. The low cost of some health interventions that have large-scale effects on population health makes health investments a promising policy tool for growth in developing countries. In addition, higher priority could be given to tackling widespread "neglected" diseases—that is, diseases with low mortality burdens that are not priorities from a pure health perspective, but that do have substantial effects on productivity (*ibid*).[7]

1.2. Human development and the epidemiological transition

The first wave of studies of the economic impact of health on economic development concentrated mainly on basic health indicators — infant mortality, life expectancy, stature, nutrition. Conceptually, it dealt mainly with a basic emergence from poverty consistent with infectious and deficiency diseases. It did not deal with the epidemiological transition towards NCDS, a concept first defined by Omran (1971) in conjunction with the demographic transition.

The epidemiological transition was first conceptualized as a unidirectional process, beginning with a dominance of infectious diseases and ending with NCDS as the dominant causes of death. However, it is now clear that several stages of transition may overlap in the same country. For example, the decline in infectious diseases may be slow or stagnant among some sectors of the population. There are a whole series of transition determinants, some of which interact with socioeconomic status. These include demographic changes; changes in risk factors; biological factors such as alteration in antigenic identity and emergence of drug-resistant strains; environmental factors such as sanitation, overcrowding, and exposure to environmental pollutants; social, cultural and behavioral factors, such as changes in community relationships, lifestyle, decreased concern for moral values (e.g. alcohol and smoking); human mobility; expansion of education and female participation in the labor force; and the practices of modern medicine. The multiplicity of causal interactions makes it clear that there is no unique path

[7] Ashraf, Lester, and Weil (2008) calibrate a model that raises doubts about the magnitude of the impact of health on economic growth. However, their model only contemplates parallel, exogenous growth and therefore does not include technological change sufficient for economic development, nor the impact of health on technological absorption. The model also assumes that the population growth remains constant in the long term, so that there is no demographic transition, and no direct or indirect impact of health on this transition. These factors all expand capital accumulation. Thus three of the main processes of development are excluded from their estimates. Under their Cobb Douglas production function, the impact obtained for health would be multiplied by the other factors' growth. They also do not consider poverty and development traps.

in the transition. On the contrary, there are many paths, a multiplicity of stages, and no society has the same experience as any other (this paragraph draws from Wahdan, 1996).

Put differently, the epidemiological transition reflects a stage of human development or a stage of technophysio evolution. Moreover, the flexible conception just pointed out also reflects the possibility of:

1) Epidemiological transitions differentiated across socioeconomic levels, as occurs in the human development trap model;

2) Unwholesome epidemiological transitions: health and demographic transitions impacted by unwholesome consumption and externalities.

FIGURE 2. HUMAN DEVELOPMENT

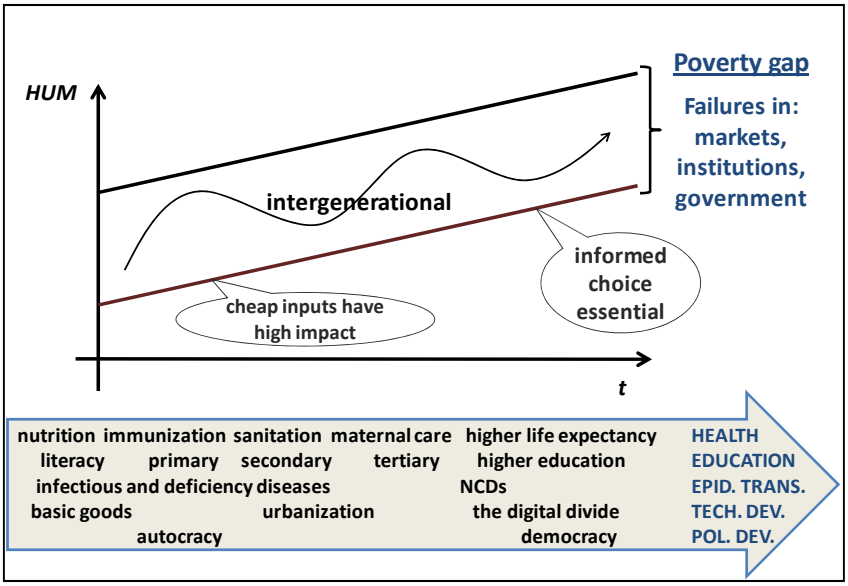


Figure 2 is depicts the essential features of an epidemiological transition differentiated across socioeconomic levels, possibility (1) above, according to the human development trap model (Mayer-Foulkes, 2008a). In this stylized representation there are two socioeconomic levels, a high one and a low one. When "human development" refers to a whole society, it is referring to the conjunction of the human development of high and low socioeconomic strata. The differences between these socioeconomic levels may persist due to failures in markets, institutions, and government. Each socioeconomic level experiences an intergenerational increase in human development HUM (for example indicated by the human components of the UNDP human development index, at an individual level). The increased level of human development follows a sequence of stages at which the critical health concerns evolve, in this case through nutrition, immunization, sanitation,

maternal care, and higher life expectancy. At the same time, the critical educational concerns evolve through literacy, primary, secondary, tertiary, and higher education, the lower socioeconomic levels lagging behind.[8] At the initial stages of the human development transition shown, mortality is dominated by infectious and deficiency diseases, while at the later stages NCDs are dominant. At the same time, technological development is represented by a transition from basic goods, to urbanizations and socioeconomic status reflected by the digital divide. As argued in Mayer-Foulkes (2011a), the political transition towards democracy is also related to human development.

Note that at low levels of human development cheap inputs have a high impact, since these are scarce for the poor, who are subject to market, institutional and government failures. As human development proceeds and the epidemiological transition occurs, even for the poor essential goods now represent a higher level of development. For example, higher levels of health services and informed choice may become essential to avoid NCDs. Moreover, technical requirements for the health sector itself may become much higher than for the population as a whole, presenting challenges in policy assessment, health surveillance, medical knowhow, medical technology, and administration.

FIGURE 3. WHOLESOME AND UNWHOLESOME HUMAN DEVELOPMENT

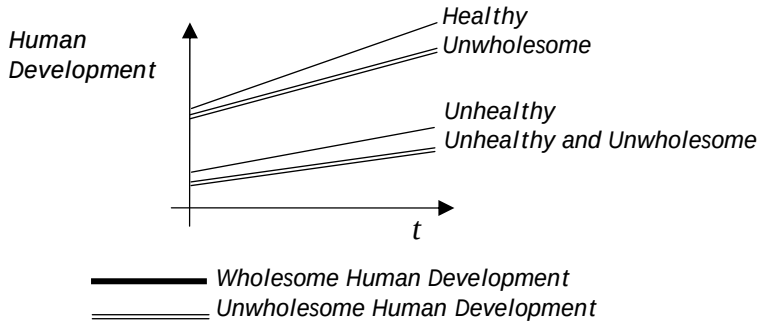


Figure 3 shows in a stylized form a comparison between healthy and unwholesome human development, according to possibility (2) above. In this case if human development is *healthy*, individuals at high and low socioeconomic levels will respectively be healthy or unhealthy. However, if human development is *unwholesome*, individual development at high and low socioeconomic levels will respectively be either *unwholesome* or *unhealthy and unwholesome*. Under unwholesome human development the epidemiology of both healthy and unhealthy social strata will shift due to the presence of

[8] A four generation lag was found across regions, both in the stature transition in Bolivia, Brazil, Guatemala and Peru, and in the cognitive transition in Mexico (Mayer-Foulkes 2008b, 2008c).

unwholesome consumption and externalities. *Healthy* and *wholesome* refer to two components of health, the second one reflecting the absence of unwholesome consumption and externalities. These components can be distinguished either at the individual level by medical diagnosis or at the population level according to epidemiological or econometric estimates. For example, the negative impacts of junk food,[9] alcohol and tobacco need not be part of the unhealth due to poverty. Note that wholesome human development is depicted as occurring at a faster rate than unwholesome human development.

Note further that both health and unwholesomeness have specific inputs.

Clean water, nutrition, vaccinations, healthy food, exercise, medical attention, and so on are health inputs. Human capital now includes knowledge on how to keep healthy.

Tobacco, alcohol and junk food are inputs of unwholesomeness. Low exercise may be a consequence of the negative environmental impacts of goods, for example urban living or office work, that themselves offer positive benefits. These structured living and labor choices are inputs of unwholesomeness.

2. The economics of NCDs

Knowledge of the economics of NCDS is essential to the formulation and evaluation of cost-effective, evidence-based health policies aimed at reducing their risk factors and prevalence. The purpose of this section is to give a general structure of the economics that are involved under the recognition of the two levels of the phenomenon: individual and collective.

Given our previous setting of NCDS in the context of long-term human development, we expand on what this implies for the economics of NCDS.

This discussion is divided into subsections addressing intergenerational life cycle dynamics, the impact of unwholesome lifestyles on life cycle profiles of human development, demand, supply and political economy of health inputs, macroeconomic impacts of NCD, and the impact of trade and globalization on NCD.

2.1. Intergenerational life cycle dynamics

For the individual, the setting of NCDS is the life cycle. The onset of disease takes a long-time and is the consequence of long-term lifestyles even before

[9] The Merriam-Webster dictionary defines "junk food" as food that is 1) high in calories but low in nutritional content; or 2) appealing or enjoyable but of little or no real value. This includes high fat, salt, and/or sugar foods, and also foods low in vitamins, minerals and other nutrients, often containing artificial coloring, artificial flavors, and preservatives.

birth. Then, the progress and treatment of the diseases, as well as their burden on households and expenditures, also are long-term impacts. The life cycle is also the natural setting for the analysis of human development as well as of the diverse economic interactions of individuals, including returns on diverse investments in health and education, saving, labor, intergenerational impacts and others. Several economic literatures are involved with the life cycle. For example there are life cycle growth models, saving models, aging models, human capital investment models, fertility models and others.

FIGURE 4. INTERGENERATIONAL, LIFE CYCLE CAUSAL IMPACTS

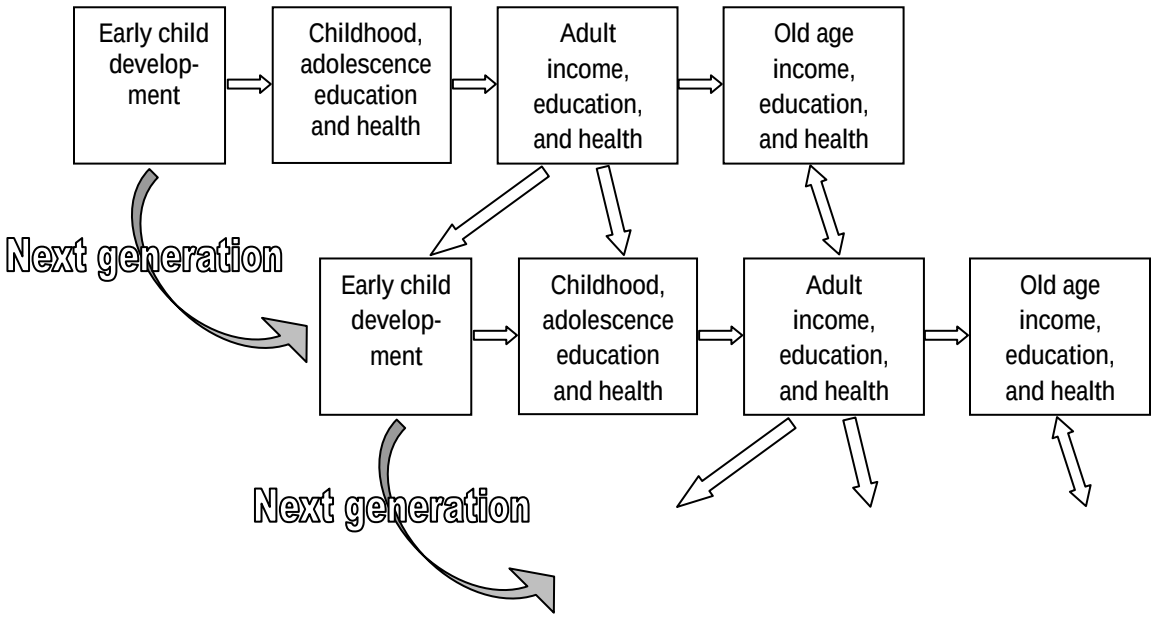
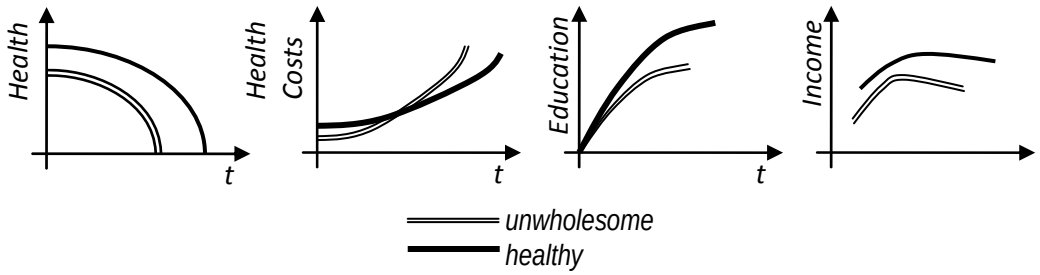


Figure 4 shows the causal structure of the intergenerational life cycle. Early child development (ECD) depends on adult (parental) socioeconomic status (SES), here a shorthand for income, education, and health. In turn, ECD is a close determinant of education and health attainments during childhood and adolescence, where the possibility of child labor can be included. Here adult SES continues to have an impact. Now follow adult income, education, and health. At this stage grandparents may impose expenditures as well as disease care burdens, with possible gender biases, or contribute to the family. Economy wide or local indicators have impacts and are impacted at every stage.

2.2. Life cycle profiles of human development

While degenerative diseases occur naturally in an aging population, unwholesome consumption choices and externalities increase NCD risks. Figure 5 gives a schematic idea of the life cycle and demographic impact of unwholesome lifestyles on life cycle profiles for health, education, income and health.

FIGURE 5. STYLIZED IMPACTS OF UNWHOLESOME LIFESTYLES ON LIFE CYCLE PROFILES OF HEALTH, HEALTH AND HOME CARE COSTS, EDUCATION, AND INCOME



The health panel in Figure 5 shows that the impact of unwholesome lifestyles begins at the fetal stage and then continues through life, lowering life quality and life expectancy. Although NCD risk factors have life-long impacts, it is enough to mention evidence on the fetal and ECD impact of NCD risk factors and NCD, which tie in with the core of the intergenerational mechanisms of human development. The US Surgeon General urged pregnant or pregnant to be women to abstain from alcohol in 2005.[10] A Fetal Alcohol Syndrome (FAS) has been recognized as a pattern of mental and physical defects that can develop in a fetus in association with high levels of alcohol consumption during pregnancy.[11] Smoking during pregnancy risks premature birth, birth defects, and infant death.[12] NCD related conditions such as obesity, type 1 or type 2 diabetes, hypertension and depression have either direct or indirect impacts on fetal health.[13] There is mounting evidence on the impact of exposure to junk food in utero and early child development on later life obesity (Bayol, Simbi and Stickland, 2005; Ong and Muhlhausler, 2011; Alfaradhi and Ozanne, 2011; Berni Canani et al, 2011).

The health costs panel in Figure 5 assumes that the inputs of a wholesome lifestyle are somewhat more expensive than those of an unwholesome one. This however need not be case. Wholesome living may simply require a higher

[10] http://www.surgeongeneral.gov/pressreleases/sg02222005.html, read 12/16/ 2011.
[11] http://www.dmoz.org/Health/Reproductive_Health/Pregnancy_and_Birth/Complications/Fetal_Alcohol_Syndrome/ has references and resources on FAS, read 12/16/ 2011.
[12] http://www.cdc.gov/reproductivehealth/tobaccousepregnancy/, read 12/16/ 2011.
[13] http://www.cdc.gov/reproductivehealth/womensrh/ChronicDiseaseandReproductiveHealth.htm, read 12/16/ 2011.

proportion of public inputs than unwholesome inputs, as in the case of potable water versus soft drinks, or in the case of the regulation of tobacco. Be this as it may, eventually the negative payoffs of unwholesome living set in, imposing health costs that are much higher than in the wholesome case.

The education panel in Figure 5 simply expresses the fact that wholesome living is associated with higher educational results. For example Northstone et al (2011) show that a junk food diet at age 3 is linked with lower IQ at age 8.5.

The income panel in Figure 5 gives a stylized comparison of income for an individual living a wholesome lifestyle, acquiring therefore a higher education and entering the workforce later; suffering less disability and mortality and therefore earning and earning a higher income during a longer lifetime.

Observe in addition that the impacts of unwholesome lifestyles on health, health and home care costs, education, and income depicted in Figure 5 vary across the socioeconomic spectrum.

An analysis of the mutual impact between demographics and NCD must be based on a life cycle analysis of the impact of NCD on fertility and mortality.

It is clear from this discussion that unwholesome lifestyles have a series of complex impacts that deform human development as a whole and impact long-term demographic dynamics, as discussed in the previous section (see Figure 3). Moreover, unwholesome lifestyles may be concentrated at lower SES levels.

2.3. Demand, supply, externalities, and political economy of health factors

Non-communicable chronic diseases, mainly cardiovascular diseases, cancers, chronic respiratory diseases and diabetes, impose huge costs on individuals suffering them as well as on their families. The main risk factors of these conditions, unhealthy diets, abuse of alcohol, smoking, and physical inactivity, are well known. Their reduction would have a significant impact on prevalence. Why do individuals consume goods that cause them harm in the future? Why do they subject themselves collectively to harmful externalities? These are questions that tackle the "individual" dimension of NCDs.

What occurs is that for the consumer the negative consequences of the main risk factors are mostly far in the future, uncertain, and unknown. For this reason we have defined above as an economic concept the *unwholesome good*, having precisely these characteristics.

It follows that for the purpose of economic analysis for health policy that there are three economic sectors that produce health inputs and externalities. These are the health sector itself, the unwholesome sector, and a sector of remaining, wholesome non-health goods contributing to health, namely the "collective" dimension (see Table 1). In fact some of the goods in

these sectors are private and some are public and/or externalities. I refer to the 'health' and 'other' sectors jointly as healthy sectors.

TABLE 1. SECTORS PRODUCING HEALTH INPUTS, WITH EXAMPLES OF THEIR PRODUCTS

HEALTH INPUT SECTOR	EXAMPLES OF HEALTH INPUT SECTOR PRODUCTS
Health Sector	Vaccinations, nutrition complements Medical prevention, screening, information campaigns Medical treatment, health insurance Administrative and surveillance capabilities, health knowledge and technology
Unwholesome Sector	Unwholesome food, including unwholesome baby food Alcohol, tobacco
Wholesome Non-health Sector	Healthy food, housing, exercise Sanitation Household health knowledge
Externalities	Examples of Externalities
	Work and urban living externalities: physical inactivity, pollution

Having determined the sectoral composition of health inputs, and the main externalities, the next concern is examining the determinants of their demand (individual) and supply (collective).

2.3.1. Demand (individual dimension)

The basic reference for individual choice is the rational maximization of preferences. In the case of NCD, the existence of very simple cost-effective measures reducing their long-term, such as reducing the consumption of salt, sugar, alcohol and tobacco, imply that this paradigm does not apply. The impact of advertising on children and adolescent obesity furnishes another example. In fact, advances beyond the paradigm of rational maximization of preferences are currently emerging for economics. Examples are given by Elster (2007), working on self-interest and altruism, myopia and foresight, beliefs, emotions; collective belief formation, action and decision making; Kahneman (2011), working on the interaction between fast, intuitive, and emotional thinking and slower, more deliberative, and more logical thinking; and Akerlof and Kranton (2010), working on identity and social norms.

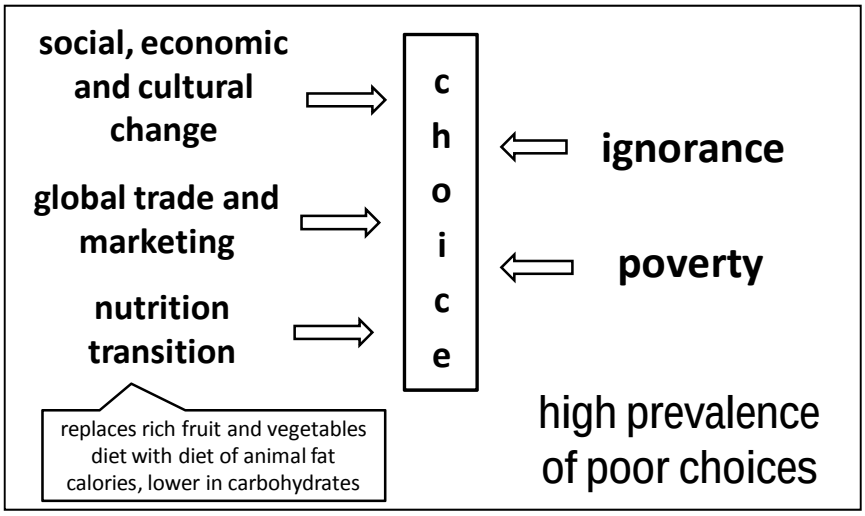
All of these considerations, as well as socioeconomic status, are relevant in consumption decisions (see Figure 6). These considerations are essential for understanding the social, inverted U learning curve that applies in the transitions to and emergence from NCD.[14] Perhaps the most expert knowledge

[14] Méndez-Florián (2011) shows there is an inverted U relation for the prevalence of several NCDs and education or income in Mexico.

on unwholesome consumption decision-making is the one informing advertising in unwholesome industries.

To further put in context the importance of the determinants of choice in the consumption of NCD risk factors, recall that amongst the underlying determinants of the global prevalence of NCDS are the major forces driving social, economic and cultural change, including globalization, urbanization and the general policy environment (WHO, 2002). Global forces such as those in trade and marketing are increasing the causal entrenchment of chronic diseases in all of the regions. Amongst these is the nutrition transition replacing a traditional diet rich in fruit and vegetables with a diet rich in calories derived from animal fats, and lower in complex carbohydrates (Popkin, 2002). Except for countries with a less developed infrastructure, this transition is well underway in almost every corner of the globe (Yach and Beaglehole, 2004). Such a diet, when combined with a low level of physical activity, regular tobacco use and alcohol consumption, sets the scene for high prevalence rates and a global distribution of NCD (WHO, 2005).

FIGURE 6. DETERMINANTS IN THE INDIVIDUAL CONSUMPTION CHOICE OF UNWHOLESOME PRODUCTS



Understanding consumer decisions is relevant not only to the unwholesome sector but also to the health and other sectors mentioned above, for example with regard to medical treatment, health insurance, poor working conditions, and other health factors.

The discussion given has bearing on the kind of data that is necessary for understanding the demand for the three types of health inputs: health, unwholesome and wholesome non-health sectors.

2.3.2. Supply

Turning to the supply of health inputs, elementary concerns are the market and industrial structures of the sectors. The reason is that the presence of market power brings about inefficiencies that require economic tools to correct.

These tools can include taxes, labeling, legal dispositions and regulations on advertising and nutritional content, information campaigns and others. Cecchini (2011), Lauer (2011), Sassi & Hurst (2008), Sassi et al (2009a, 2009b, 2009c) compare the effectiveness of various such policy mixes for some OECD countries. They can also include promoting innovation for a wholesome fruit and vegetable agro industry, so as to better provide an alternative to the junk food industry. It is often the case that individual producers cannot agree on voluntary measures to improve their products without some government initiatives to coordinate their industries. Such policies, for example with regard to salt content, can also be effective.

Because the idea of market efficiency is so prevalent, it is necessary to establish the degree of market power that exists, and to take it into account in the formulation of policy. According to WHO (2002), the growing concentration and power of large corporations, the ease of the movement of capital, cheaper transport and communication and increasing integration of markets and regions, play a critical role in the generation of global health. Influential studies draw attention to the impact of globalization on health determinants such as the environment (McMichael, 2002), health systems (Price et al., 2001), drug provision and tobacco consumption (Bettcher et al., 2000). Chaloupka and Laixuthai (Bettcher et al. 2000), show an almost ten per cent increase in cigarette consumption in countries that were forced to open their markets to American cigarettes. More recently, Bettcher et al. (2003) demonstrate a positive relationship between trade liberalization and tobacco consumption, with the greatest correlation in low-income countries (*ibid*).[15]

Much of the impact of globalization occurs through multinational corporations. For example their advertising is a very important part of the dietary transition. Nestle and Coca Cola each spent over $2.1 billion in advertisement in 2007 (Crain Communications Inc. and The Ad Age Group, 2008). For purposes of comparison, WHO's organization-wide budget for the two years 2008-2009, was US$4.2 billion.[16]

Global advertising spending by the top 100 advertisers, in measured media bought in 2007, was US$11.0 billion in food, US$3.8 billion in restaurants (such as McDonalds), US$3.7 billion in soft drinks, and US$1.6 billion in beer, wine and liquor. These are all known to directly impact NCD. Their advertising budget of US$20.1 billion is ten times the full budget used by WHO to deal with

[15] See Mayer-Foulkes (2011b) for a wider discussion. The working paper version produced for PAHO is available at http://new.paho.org/hq/dmdocuments/2011/16-MayerMacroReview.pdf

[16] Information read at http://www.un.org.np/agencyprofile/profile.php?AgencyID=12 on 11/20/2009.

world health issues. Advertising for the drug industry ran at US$9.4 billion, also way beyond WHO's capacity to regulate. Advertising in personal care (US$23.4 billion) and cleaners (US$3.3 billion) could also impact health.[17]

Following Pogge (2005a, 2005b), on the basis of the United Nations Declaration of Human Rights, the systematic nature of the damages caused by advertising implies they are massive violations of human rights.

When the cheapest technology in a class of foods produces a healthy product, there is no problem. The problem is when a cheap technology produces an unwholesome product. A bias towards unwholesome products may be inherent in the innovation process, which itself also generates the market power that has such serious health consequences. The sale of unwholesome products is characterized by adverse selection (consumer cannot evaluate the product from its appearance), irresponsible marketing and production (manufacturer knowingly produces and promotes unwholesome products), and other problems.

Concentrated market power is also present for other health inputs, raising the prices of health insurance, treatments and medication. Again, the data that is required for understanding the supply of the three types of health inputs includes data on market structure, advertising, and other determinants.

Another important determinant of supply is access to the basic resources of food production, labor and land. It is not surprising that the globalization of the food, junk food, alcohol and tobacco markets is having large impacts on land allocation, distribution and sustainability.

Junk food substitutes vegetable and fruit consumption. Perhaps this is because these healthier products are less susceptible to large-scale commercial production and therefore more expensive. Their production may therefore on the one hand be less competitive and on the other hand damage the environment less. It is necessary to understand the precise supply side economic determinants of the nutrition transition, which is shifting agricultural land use and may be making it less sustainable.

The magnitude of the transformation is illustrated by the global transnational land grab,[18] which is occurring mainly in Sub-Saharan Africa, but is also relevant in Latin America (GRAIN, 2010; Lopez-Gamundi and Hanks, 2011). Large corporations are purchasing land to produce healthy and/or unwholesome food for export.

[17] See Crain Communications Inc. and The Ad Age Group (2008), page 7, for a table with the data. These paragraphs on advertising are quoted from Mayer-Foulkes (2011b).

[18] The term "land grab" refers to the global wave of land purchases by transnational corporations (e.g. Cotula *et al*., 2009, from FAO, IIED and IFAD). The term highlights the impact of political and market power, thus distinguishing from the ideas of efficiency implied by competitive markets.

> *The land investment story currently unfolding, and analyzed in this report, reflects deep global economic and social transformations.* These ongoing processes have profound implications for the future of world agriculture. Decisions taken today will have major repercussions for the livelihoods and food security of many, for decades to come. This means that choices made now must be based on strategic thinking rather than piecemeal and opportunistic negotiations. (Concluding remarks by Cotula *et al*., 2009, in a FAO, IIED and IFAD report.)

We can add that the repercussions of the land grab include NCD prevalence and costs, through the global impacts of unwholesome production. Policies to channel the agricultural process towards the production of healthy food are especially important.

2.3.3. Externalities

The main NCD factor that works through externalities is the lack of exercise, which is a consequence of urban living and working conditions. Unhealthy work places are also considered an important risk factor in the literature. A series of policies already exist in this regard, for example with respect to transportation. However, these and other externalities such as pollution need to be taken into account as NCD factors.

2.3.4. Political economy

Demand and supply are essential for understanding the equilibrium levels of health inputs. However, the presence of market power implies a heightened role for a political economy analysis.

For example, the pharmaceutical and health product sector was the highest spender in lobbying through the period 1998-2011, $2.2 billion dollars.[19] During Obama's campaign for health reform in the US, pharmaceutical companies seeking to avoid public competition and government negotiation of prescription drug prices increased their lobbying by 41% over the previous year,[20] when they had spent about US$230 million.[21] Al-Ississ and Miller (2010) show health industry stock prices rise when expectations of health reforms decrease.

Chopra (2002) discusses the implications of corporate power for the promotion of healthy diets. The situation is so dire that Chopra and Darnton-

[19] Read at http://www.opensecrets.org/lobby/top.php?indexType=i on 12/17/2011.
[20] Read at http://industry.bnet.com/pharma/10002798/pharma-lobbying-money-whos-spending-what-fighting-healthcare-reform/ on 12/17/2011.
[21] Read at http://www.opensecrets.org/news/2009/06/drug-makers-cash-in-on-lobbyin.html on 12/17/2011.

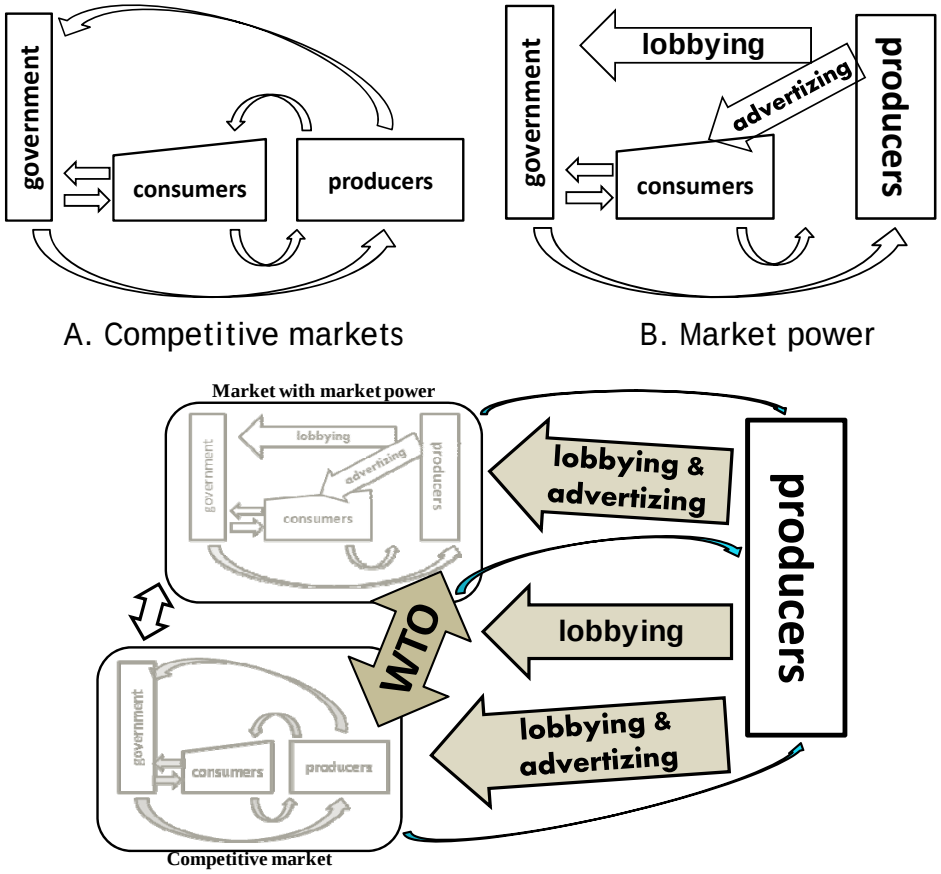
Hill (2004) recommend the actions such as those taken against the tobacco industry be used against the unwholesome food industry. Cited verbatim reports and advice to government from national expert groups (such as medical associations); multilateral organizations such as WHO taking the lead on identifying avoidable health risks of continuing overconsumption of unhealthy diets and lack of physical activity; release and dissemination of marketing strategies used to target young children; alternative sources of funds to support sports and similar events; parents could sue schools providing unhealthy diets; litigation against companies aggressively targeting young children; health warnings on high fat foods and high sugar soft drinks; taxes on high sugar soft drinks and perhaps targeted high fat foods; campaigns by national, international, and non-governmental consumer groups; use of freedom of information disclosure; multilateral organizations such as WHO take lead on identifying, and naming, the effect of obesogenic environments; vigilance by peer reviewed journals, and other media, on noting industry links and possible conflicts of interest when publishing articles; increase publication of articles addressing the issue; exposure of the practice; pressure by consumer associations; use of World Trade Organization rules that are in place to protect public health.

Competitive markets assume that there are sufficiently numerous consumers and numerous producers that they are all price takers. Their power to collude so as to raise prices is negligible. Correspondingly, their power to organize so as to influence government policy is relatively small. In the case of market power, however, the number of producers is small, and they make a profit. Correspondingly, their power to organize to influence both government and consumers is much higher. The existence of lobbying, advertising and profits are evidence of market power. In the case of transnational corporations wielding global market power the power to influence is much higher still. Not only are their resources much greater, they now in many ways stand beyond the reach of national governance, and wield heavy influence on international organisms.

At the present time markets have been expanded to an international level, through bilateral trade agreements and the trade treaty agreements signed by 123 countries leading to the creation of the World Trade Organization (WTO). These treaties have established a global market based on the basic principle of non-discrimination between trading partners nor between imported and locally-produced, otherwise similar, goods. However, the corresponding level of global governance is much lower. Governance is much weaker compared to markets at the global than at the national levels. Even national governance has been weakened, in so far as national public polices now have to be consistent with WTO agreements. In the case of policies applying to unwholesome production, much of which operates at the international level and under the protection of WTO rules, it is to be expected that there will be

huge obstacles to overcome. For example, "the priorities of multinational corporations were key sticking points in discussions over the recently signed UN political declaration on NCDs" (Fink & Rabinowitz, 2011). WHO itself is not immune to these problems, which impact policy formulation and research objectivity (Williams, 2006; Shah, 2011; Feig & Shah, 2011).

FIGURE 7. MUTUAL INFLUENCE AND AGGREGATE CHOICE OF CONSUMERS, PRODUCERS, GOVERNMENTS, COUNTRIES AND INTERNATIONAL ORGANIZATIONS UNDER A. COMPETITIVE MARKETS; B. MARKET POWER; C. GLOBAL MARKET POWER



A. Competitive markets

B. Market power

C. Global Market Power under International Trade Relations

Figure 7 gives a diagrammatic expression of the mutual influence and aggregate choice of consumers, producers and government under competitive markets, market power and global market power.

WHO and WTO (2002) jointly examine the interaction between WTO agreements and public health. This document does not mention policies on NCDs except for the WHO Framework Convention on Tobacco Control (FCTC). For example, "Food Safety" only refers to food-borne illness. Although human

health is legally recognized by the WTO as being "important in the highest degree," coordinating public health policies with trade agreements offers significant difficulties to policy makers. Proper coordination between trade and health officials at the national and international levels was crucial in the negotiation of a WTO-consistent FCTC. The FCTC did in fact find a pathway to increase global governance in a context of multiple free sovereignties. A crucial facet for the formulation of WTO-consistent national and international policy is scientific evidence, now a legal prerequisite for policy formulation (WHO and WTO, 2002). Both the WTO and the Sanitary and Phytosanitary Measures (SPS) Agreement require members to have a scientific basis to justify trade measures aimed at mitigating a health risk. Given the complexity of the issues, this can become a serious obstacle to action, for example in the absence of systematic data collection. Since public policy at the international level is now vital, it follows that systematic national and international data collection has become a public policy priority, requiring adequate support. Hopefully a way forward can be found. As Sir George Alleyne put it (IDF, IUAC &WHF, 2009).

> *I agree that we can always have more evidence but I am emphatic that we now have enough evidence to take action.*

Summarizing, the concentrated market structure of unwholesome production has large national and international political economy impacts that obstruct the development of necessary public health policies and further distort national and global production and resource allocation.

2.4. Macroeconomic impacts of NCDs and their risk factors

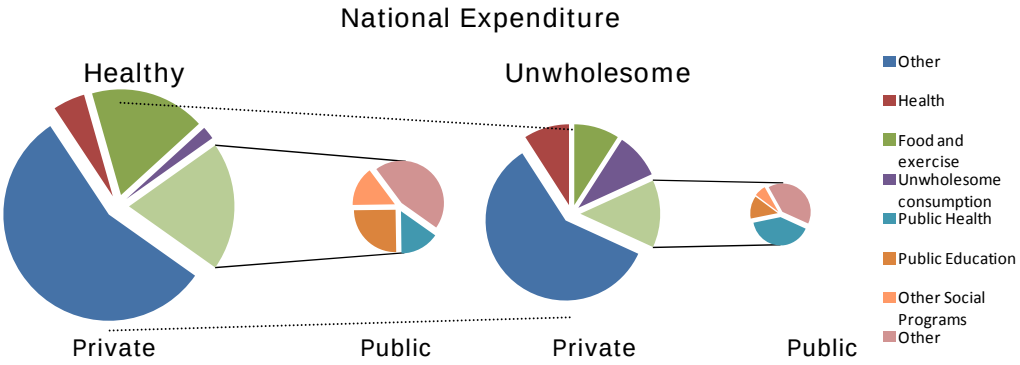
Human development interacts with the whole economy both statically and dynamically. In turn, NCDs and their risk factors affect economic aspects such as human development, the health sector, labor quality, saving, fiscal expenditure.

2.4.1. Static impacts of NCDs and their risk factors

An outline of expected static impacts of an increased unwholesome sector would be approximately the following (see Figure 8). When, for the reasons discussed above, the unwholesome consumption becomes a larger sector of the economy than is optimal, it reduces the healthy food sector. Lifestyles and environmental externalities also reduce resources dedicated to exercise, for example through urban planning with less green spaces, unsafe streets and a lack of open spaces for walking. As a consequence, the prevalence of NCDs increases and therefore both private and public health sector expenditures

increase. Other public expenditures are consequently also reduced, such as expenditures on education and other social programs promoting equality. Another impact of NCDs is a reduction in productive labor, diminishing the aggregate product.

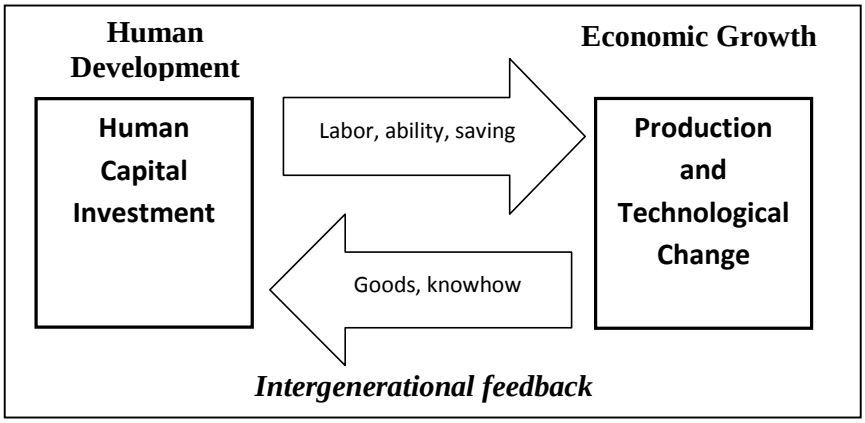
FIGURE 8. OUTLINE OF STATIC IMPACTS OF UNWHOLESOME PRODUCTION



2.4.2. Dynamic impacts of NCDs and their risk factors

At the same time, if unwholesome products are those that are easier to industrialize for large scale production, and therefore are disproportionally linked with market power, there may be political economy impacts reducing social expenditure programs. An increased tolerance of market power may also increase private health expenditure, by allowing extraordinary profits in health input industries (e.g. pharmaceuticals, processed foods). These large economic interests may also lobby for higher public expenditure in health, and lower expenditures on social programs. In effect they tend to empower the few as opposed to the many, reducing democracy.

FIGURE 9. OUTLINE OF DYNAMIC IMPACTS OF UNWHOLESOME PRODUCTION



Observe that some of these impacts are partly cancelled in GDP measurements, because both unwholesome products and the efforts dedicated to reduce their negative health impacts are assessed as positive contributions to GDP. They are nevertheless detected by measures of morbidity and mortality.

Human development interacts with economic growth. NCDs affect human development overall, specifically labor quality and supply, ability, and saving (Figure 9). These in turn are inputs of economic production and technological change (including innovation, adoption and transfer). In turn, the economy provides goods and knowhow to both adults and children, generating an intergenerational cycle.

The presence of unwholesome production and NCD reduces the flow of inputs in both directions (from the human sector to the economy and back), and therefore both production and economic growth.

3. Policy and policy evaluation for reducing NCDs and their risk factors

The report of the Commission on Macroeconomics and Health (2001) on Health, Economic Growth, and Poverty Reduction (Alleyne and Cohen, 2001) inaugurated an era in which health policies have been valued not only for their direct benefits on people's welfare but also for their indirect benefits through their impact on improved economic performance (Alleyne, 2009).

The same principle applies to NCDs. These diseases impose high direct costs both on the people who suffer them and on people who must care for them, their direct family and principally women in the family, as well as the general taxpayer supporting public health. They also impose large indirect costs on economic performance, reducing labor, human capital, saving and significantly distorting the whole economy. Although some evidence exists on

the financial burden imposed to households and the extent to which they suffer financial catastrophe or impoverishment due to NCDs few research is available (WHO, 2011). The first thing that is needed for a cost and benefit policy analysis for the Region is to:

- Conduct a coordinated estimate of the direct and indirect costs of NCD for countries in the Region. In particular, investigate the incidence of lifestyle risks according to socioeconomic status, and the impact of economic growth and the demographic transition on these risks. To what extent are people/households affected by financial catastrophe and impoverishment due to NCDS? Where do the different countries lie on the development pathway?

However there is a new economic element to NCDs. This is that *the illness itself requires economic medicine*. In the case of NCDs, prevention is the cure, and prevention requires reducing the risk factors of NCD: unhealthy diets, abuse of alcohol and smoking, and physical inactivity, that is, reducing unwholesome production and consumption. This is the root of the need for multisectoral policies for NCDs.

It is clear that implementing cost-effective, evidence-based policies for reducing NCDs and their risk factors poses a very significant scientific challenge in public policy. On the one hand action is urgent, and on the other the data needs and time required for a full economic analysis of NCD are daunting.[22] What can be the best short term Regional strategies for facing these challenges? The best strategy is to, overall, jointly implement policy and carry out research.

- Policies for attending and preventing NCDs, and initiatives for generating data and carrying out policy evaluation, need to be implemented jointly.

In what follows we comment on policies for promoting health sector capability for NCDs, for prevention of NCD risk factors, and for an integrated data initiative.

[22] In fact what is required is a *body of knowledge* covering the mutual impact across the life cycle of NCD and NCD prevalence factors on economic and human development in general. The list of relevant topics and factors include ECD, nutritional supplements, cognitive ability, education, returns to education and health, socioeconomic status and the persistence of inequality, barriers to knowledge on health and consumption, community needs, fertility and the demographic transition, individual, local and aggregate empowerment and democracy, local advertising and local pricing, substitutes for unwholesome products, sanitation, communication and transportation infrastructures, other government services and public goods, political process, state of law, etc.

3.1. Health sector capability for NCDs

Besides aiming to prioritize NCDs in the political and public health agendas, the main elements considered in PAHO's Regional Strategy and Plan of Action (PAHO, 2007) for reducing the NCD burden are: implementing surveillance of the diseases, reorienting health systems to respond to chronic conditions, and implementing health promotion and disease prevention measures (PAHO, 2007).

For health systems in the Region, these policies imply huge organizational and technological challenges. These challenges consist in transferring technologies and designing and implementing policies as quickly as possible. International cooperation has a significant role to play in minimizing the costs and difficulties associated with these transfers and decisions, and in accelerating them. International organisms such as the OECD and WHO have already been working on preparing economic frameworks and policy choice models for preventing obesity and NCDs in cost effective ways. These models take into account both direct and indirect costs of NCD, in the long-term and across the life cycle, and compare a variety of policy alternatives (Cecchini, 2011; Lauer, 2011; Sassi & Hurst, 2008; Sassi et al, 2009a, 2009b, 2009c). They require calibration to different national circumstances and can be regarded as first approximations to economic evaluation, providing a point of departure for further policy design, data collection, and policy evaluation. The difficulties of carrying out thorough economic evaluation for policy design in the case of NCD, and of obtaining the necessary data is discussed in a workshop on Country-Level Decision Making for Control of Chronic Diseases (National Academy of Sciences, 2012). What is necessary is to:

- Conduct the coordinated application of OECD and WHO type policy choice models for preventing obesity and NCD's across the Region's countries. Coordinate calibration of these models with local health and other sector governance, as well as the implementation plans.

The tasks involved in establishing NCD surveillance and in calibrating initial policies on NCDs thus also involve initial steps in data collection, and in evaluating data availability. The same holds for other NCD policy instruments such as CARMEN (the community-level integrated health promotion and disease prevention project for reducing NCDs mentioned above), which could also include a data dimension. In promoting health system capabilities for dealing with NCDs, that are in any case intensive in technology and knowledge based systems, data collection for policy design and evaluation can also be promoted. This data may take the form of aggregate data representing the

local level, which would allow for a Regional analysis and evaluation of NCD and NCD policies.[23]

- Coordinate a data initiative related to CARMEN activities.

3.2. Prevention of NCD risk factors

As mentioned before, an economic characteristic of NCDs is that prevention requires tackling the factors that cause the prevalence of unhealthy diets, abuse of alcohol and smoking, and physical inactivity; that is, reducing unwholesome production and consumption, namely the collective and individual dimensions. This is the root of the need for multisectoral policies for NCDs.

The fact that dealing efficiently with a health issue requires the application of economic policies to whole sectors of production, themselves unrelated to health, is something quite new. Not least because the demand and supply of unwholesome products is subject to a series of market failures, and therefore requires the application of sophisticated economics which seem to run against the grain of an era of liberalization. In addition, these policies require application in a context of global markets for which adequate governance has yet to be constructed.

It is for this set of reasons that prioritizing NCDs in the political and public health agendas at both the national and international levels plays a central role in PAHO's Regional Strategy and Plan of Action for reducing the NCD burden for the Region (PAHO, 2007). It seems clear that coordinated action with other organizations such as the IADB, the World Bank, WHO, and WTO will be essential for implementing the most effective policies on NCD.

A simple example would be a Healthy Diet Initiative for the Americas, using economic tools to promote the production and consumption of fruit, vegetables, grains and dairy products across the continent, at the same time reducing junk food consumption, aiming to align diets with nutritional guidelines.[24]

These tools can include taxes, labeling, legal dispositions and regulations on advertising and nutritional content, information campaigns and others.[25,26]

[23] Moreover, community based actions such as those promoted by CARMEN can serve to promote a grassroots base for democratic institutions channeling human development needs in general. Democratic development can itself be considered as an integral part of human development (Mayer-Foulkes, 2011a).

[24] Such an initiative would bring WHO's Global Strategy on Diet, Physical Activity and Health to a new level of implementation.

[25] Cecchini (2011), Lauer (2011), Sassi & Hurst (2008), Sassi et al (2009a, 2009b, 2009c) compare the effectiveness of various such policy mixes for some OECD countries.

They can also include promoting innovation for a wholesome fruit and vegetable agro industry, so as to better provide an alternative to the junk food industry. As mentioned above, such economic tools can be designed to be consistent with WTO rules, something which would be easier and simpler to achieve in a coordinated international framework. An early implementation of such policies would also ensure that fixed costs in agricultural development be directed towards healthy food production, rather than wasted in unwholesome products leading to high NCD burdens. Summarizing,

- Conduct a coordinated study of the economic tools available to reduce the prevalence of NCD risk factors across the Region's countries in coordination with local multisectoral representatives, with a view to designing and evaluating policy.

An antecedent study for such a policy proposal is presented by Desjardins (2011) and Thomassin (2011), who evaluate the impact for the Canadian case of increasing the consumption of fruits, vegetables and dairy products and reducing the consumption of meat products so as to adhere to Canada's Healthy Diet Guidelines. Using the Global Trade Analysis Project (GTAP) model, a state of the art tool for analyzing trade policy, they estimate that Canada's GDP would rise significantly, by 0.34%, with overall marginal increases in welfare for Canada's trading partners. A similar study could be carried out for the Americas as a whole, or for individual countries.[27]

It may in fact be simpler, cheaper and more effective to design and evaluate such macro policies for reducing NCD risk factors at the continental level than piecemeal micro policies replicated independently in a series of regional and country initiatives, making possible a coordinated implementation across countries.

In the previous subsection we saw that PAHO's Regional Strategy and Plan of Action (PAHO, 2007) has clear objectives with regard to promoting health sector capabilities for NCDS. Moreover, the implementation of these objectives can serve to promote an initial data initiative.

Similarly, it is necessary to clarify the mutisectorial elements of the Regional Strategy and Plan of Action for NCD policy, because it is through their implementation in collaboration with the diverse concerned government bodies in the Region (national and international) that these elements can gain momentum.

[26] Innovation is also possible in the variety of legal instruments available to reduce risk factor prevalence. For example, there could be initiatives in legal responsibility in which foreign cases could be used as legal antecedents, or the adoption of foreign regulations facilitated.

[27] Such studies may also consider what the best ways to procure protein consumption may be.

As mentioned above, a policy framework for limiting tobacco consumption has already been achieved by WHO, the FCTC. Such regulation is needed because an unhealthy product such as tobacco cannot be shifted from unwholesome to healthy. Its consumption can only be reduced, for example by taxes, labeling, information campaigns, and other measures. Efficiency calls for the consumer to pay for the negative externalities at the time of consumption, and is therefore consistent with taxes. Alcohol abuse is essentially similar. A similar framework can surely be devised for limiting alcohol abuse.

In the case of food products, however, the hope is to shift unwholesome to healthy production. Again this calls for a mix of policies, such as taxes, labeling, regulation, voluntary agreements. It remains to clarify what the feasible alternatives, as well as costs and benefits, are for designing and promoting a Healthy Diet Initiative for the Americas as described above. Conducting the necessary macro-economic studies to evaluate and design a WTO (or Latin American) initiative on healthy diet, promoting a healthy food agro industry and channeling agricultural resource allocation in this direction is a feasible short-term objective, based for example on Desjardins (2011) and Thomassin (2011). The realization of these studies requires a modicum of collaboration with the diverse concerned government bodies in the Region that are the natural multisectoral partners for PAHO's NCD policies. In addition such collaboration can also be accompanied by a preliminary data initiative on NCD risk factor prevalence determinants. Summarizing,

- Study trade impact and health benefits of a healthy diet initiative at the national and Regional levels.
- Conduct a coordinated study of the extent and feasibility of policies for promoting healthy workplaces and healthy urban environments.

3.3. A comprehensive data initiative

Supporting cost-effective, evidence-based policies for reducing NCDs is a highly data intensive endeavor, that often requires data that is unavailable. Thus, for the design and implementation of NCD policies, it is necessary to establish an integrated data initiative that supplements diverse economic surveys with NCD data modules.

Designing and initiating the implementation of such a data initiative is a feasible and necessary short term objective. Future evaluation of NCD policy will benefit from the earliest and widest possible data availability, that can also be designed to serve as base surveys for policy evaluation. Moreover,

policy proposals to other agencies such as the WTO require a substantial evidence base that needs to be generated as soon as possible.

The design of a data initiative must cover all of the aspects of the economics of NCD covered above:

- Intergenerational life cycle dynamics (see Figure 4).
- Life cycle profiles of human development and demography (see Figure 5).
- Demand, supply and political economy of health inputs (see Table 1 and Figures 6 and 7).
- Static and dynamic macroeconomic impacts of NCDs and their risk factors (see Figures 8 and 9).

Two types of data can be useful. The first is microeconomic data on living standards, employment, fertility, and so on, usually collected in surveys, that can be used to analyze behaviors and impacts at the individual level. Data initiatives following the individual could be useful, as has been proposed for the health system (GPES, 2009). The second is macroeconomic data at the regional level, which perhaps can be meaningfully collected even from non uniform sources, and can be used to analyze behaviors and impacts at an intermediate aggregate level.

It is enough here to stress the need to obtain data that is usually unavailable. For example, data to simultaneously understand the demand and supply of wholesome and unwholesome non-health inputs (see Table 1). Determinants of supply include information on industrial and market structure, technological and trade determinants, advertising, voluntary agreements and regulation (such as on salt reduction and trans-fat), and local pricing of alternative products. Determinants of demand include a full set of individual determinants of choice of the type usually included in household surveys (economic and educational status, demographics and so on). These choice determinants may need to be expanded to include some of the irrational aspects of choice, such as indicators of identity, social norms, and learning.

In fact health costs, health insurance and health coverage, are also subject to demand and supply determinants, market power and political economy issues that can also be analyzed for improved performance, and that need to adapt to higher service flows in health.

Some of the policy choice models and economic frameworks used by the OECD and WHO are based on calibrations that abbreviate the research needed to establish coefficients for risk factor impacts, policy impacts, as well as indirect costs. Some of these occur across the life cycle and may otherwise take a long time to obtain. Meta-studies can also play a role in yielding a first approximation to cost-effectiveness and policy choice.

- Design an integrated and comprehensive data initiative across countries to incorporate NCD risk factors, prevalences, and costs in the national data systems.
- Incorporate health insurance and coverage concerns.

3.4. Summary of research proposals related to policy and policy evaluation

The previous discussion arrives at the following conclusions with regard to the research that is necessary to support NCD policy implementation and evaluation. The idea is for PAHO to provide leadership, coordination and complementarities to the Region's efforts. The research and policy initiatives complement and promote each other, at the health sector and multisectoral levels.

1) Conduct a coordinated estimate of the direct and indirect costs of NCD for countries in the Region. In particular, investigate the incidence of lifestyle risks according to socioeconomic status, and changes under the impact of economic growth and the demographic transition. Where do the different countries lie on the development pathway?

2) Policies for attending and preventing NCDS, and initiatives for generating data and carrying out policy evaluation, need to be implemented jointly.

3) Conduct the coordinated application of OECD and WHO type policy choice models for preventing obesity and NCD's across the Region's countries. Coordinate calibration of these models with local health and other sector governance, as well as the implementation plans.

4) Coordinate a data initiative related to CARMEN activites.

5) Study trade impact and health benefits of a healthy diet initiative at the national and Regional levels.

6) Conduct a coordinated study of the economic tools available to reduce the prevalence of NCD risk factors across the Region's countries in coordination with local multisectoral representatives, with a view to designing and evaluating policy.

7) Conduct a coordinated study of the extent and feasibility of policies for promoting healthy workplaces and healthy urban environments.

8) Design an integrated and comprehensive data initiative across countries to incorporate NCD risk factors, prevalences, and costs in the national data systems.

9) Incorporate health insurance and coverage concerns.

Conclusions

This article develops a conceptual framework for the economic analysis of NCDs that outlines the evidence base that a cost-effective formulation of policies to reduce the burden of NCD requires. The conceptual framework sets the epidemiological transition towards NCDs in the context of long-term human development, itself encompassing both technophysio evolution and the persistence of inequality through the intergenerational transmission of socioeconomic status and health. The conceptual framework also explains how the epidemiological transition can be distorted by unwholesome consumption, based on an uninformed and uncertain consumer (individual dimension), and produced by sectors with market power and vested interests that often conflict with public health. There are also unwholesome externalities that derive from unhealthy workplaces and unhealthy urban environments (collective dimension).

Because NCDs are a costly, lifelong phenomenon, the economics of NCD are complex. They involve both intergenerational life cycle dynamics and lifelong profiles of human development and demography, and have significant static and dynamic macroeconomic impacts. In addition, the economics of risk factor prevalence are quite complex. Demand is determined by "irrational" behavior involving identity, social norms and learning that only recently are being brought into focus. Supply involves market power and advertising. It therefore also brings up political economy impacts that affect policy formulation.

It follows that creating the databases and body of knowledge necessary for policy evaluation poses a scientific challenge that could take as much time to surmount as is needed to put preventive policies into place. Under these considerations, what are the most effective and cost-efficient policies for immediate application tackling both, the individual and collective dimensions?

What is necessary is to simultaneously implement health policy and construct the necessary evidence bases. This can apply to proposals such as implementing disease surveillance and reorienting health systems to respond to NCD, and implementing health promotion and disease prevention measures (PAHO, 2007).

It would also be useful to conduct a coordinated estimate of the direct and indirect costs of NCD for countries in the Region. In particular, investigate the incidence of lifestyle risks according to socioeconomic status, and changes under the impact of economic growth. Where do the different countries lie on the development pathway?

A specific characteristic of NCDs is that their main risk factors are manmade: exposure to unwholesome consumption and externalities. Prevention is indicated, and this requires the application of multisectoral

policies to reduce the prevalence of NCD risk factors. It is unusual for the health sector to promote economic policies significantly involving other sectors. For this reason PAHO and WHO have dedicated a substantial effort to prioritizing NCDs in the political and public health agendas. However, the initiative to formulate sufficiently effective multisectoral policies and to establish the necessary links between the health sector and other sectors involved, for example agro industry, inevitably pertains to the health sector, and therefore represents areas where a Regional Strategy and Plan of Action can be strengthened. For example, a comparative investigation across the Region's countries of policy alternatives for promoting healthy food and exercise and for reducing junk food and alcohol abuse, that can lead to substantial proposals at the national and international levels, could be very useful.

Finally, a comprehensive data initiative is needed in addition to expanding data availability in tandem with policy implementation. Such a data initiative is essential for making substantial, informed proposals for reducing risk factor prevalence at the national and international levels, for establishing baselines for policy evaluation, and for designing NCD policy. What is necessary is to analyze existing data sources across the continent so as to determine the best way to expand them into the future so as to cover the evaluation of the direct and indirect impacts of NCD and NCD policies.

These research initiatives, set out in more detail in the previous section, have amongst their objectives to complement and promote NCD policies as they are implemented, to highlight the need for multisectoral approaches, and to provide leadership, coordination and complementarities to the Region's efforts.

References

Adeyi, Olusoji; Robles, Syvia; Smith, Owen (2007). *Public Policy and the Challenge of Chronic Noncommunicable Diseases*, The World Bank, Washington, D.C.

Akerlof, George A; Kranton, Rachel E. (2010) *Identity Economics: How Our Identities Shape Our Work, Wages, and Well-Being*, Princeton University Press.

Alfaradhi, MZ & Ozanne, S.E. (2011). "Developmental programming in response to maternal overnutrition" *Frontiers in Epigenomics* doi: 10.3389/fgene.2011.00027.

Al-Ississ, Mohamad & Miller, Nolan H. (2010). "What Does Health Reform Mean for the Healthcare Industry? Evidence from the Massachusetts Special Senate Election", NBER Working Papers 16193, National Bureau of Economic Research, Inc.

Alleyne, George A. O. & Cohen, Daniel (2001). "Health, Economic Growth, and Poverty Reduction, The Report of Working Group 1 of the Commission on Macroeconomics and Health". Available at: http://whqlibdoc.who.int/publications/9241590092.pdf.

Alleyne, George A. O. (2009). "Health and Economic Growth: Policy Reports and the Making of Policy", Chapter 2, Health and Growth, Edited by Michael Spence and Maureen Lewis, Commission on Growth and Development, available at http://www.growthcommission.org/storage/cgdev/documents/healthandgrowthfull.pdf.

Arora, S. (2001). Health Human Productivity and Long-Term Economic Growth. *Journal of Economic History*, 61 (3), pp. 699-749.

Ashraf, Quamrul, Lester, Ashley and Weil, David N. (2008), "When Does Improving Health Raise GDP?", No. 2008-7, Working Papers, Brown University, Department of Economics, available at: http://EconPapers.repec.org/RePEc:bro:econwp:2008-7.

Bayol, S.A., Simbi, B.H. & Stickland, N.C. (2005). 'A maternal cafeteria diet during gestation and lactation promotes adiposity and impairs skeletal muscle development in rat offspring', *Journal of Physiology,* vol. 567 (P13), pp. 951-961.

Berni Canani, Roberto; Di Costanzo, Margherita; Leone, Ludovica; Bedogni, Giorgio; Brambilla, Paolo; Cianfarani, Stefano; Nobili, Valerio; Pietrobelli, Angelo; Agostoni, Carlo (2011). "Epigenetic mechanisms elicited by nutrition in early life", *Nutrition Research Reviews*, doi:10.1017/S0954422411000102.

Bettcher DW, Yach D & Guindon GE (2000) Global trade and health: key linkages and future challenges. *Bull World Health Organ*. 78:521-34.

Bloom, DE & Canning, D. (2008). "Population Health and Economic Growth" Working Paper No. 24, Commission on Growth and Development, World Bank.

Bloom, DE, Cafiero, E.T., Jané-Llopis, E., Abrahams-Gessel, S., Bloom, L.R., Fathima, S., Feigl, A.B., Gaziano, T., Mowafi, M., Pandya, A., Prettner, K., Rosenberg, L., Seligman, B., Stein, A., & Weinstein, C. (2011). *The Global Economic Burden of Non-communicable Diseases.* Geneva: World Economic Forum.

Case, A., Fertig, A., & Paxson, C. (2003). "From Cradle to Grave?: The lasting impact of childhood health and circumstance". *NBER Working Paper* 9788. Cambridge, MA: National Bureau of Economic Research.

Case, A., Lubotsky, D., & Paxson, C. (2002). "Economic Status and Health in Childhood: The Origins of the Gradient". *American Economic Review*, 92 (5), pp. 1308-1334.

Cecchini, Michele (2011). "Preventing Obesity and NCDs: an Economic Framework", OECD, presented at the Workshop on Economics of Prevention of Non-communicable Diseases and Risk Factors, Pan American Health Organization, November 14 and 15, Mexico City.

Chopra, Mickey, Ian Darnton-Hill (2004). "Tobacco and obesity epidemics: not so different after all?" *BMJ* 2004;328:1558-1560 (26 June).

Comisión Mexicana de Macroeconomía y Salud (2007). *Macroeconomía y Salud: Invertir en Salud para el Desarrollo Económico*. Fondo de Cultura Económica. México.

Commission on Macroeconomics and Health (2001). Macroeconomics and health: Investing in health for economic development. Report of the Commission on Macroeconomics and Health [commissioned by WHO] chaired by Jeffrey D. Sachs.

Cotula, Lorenzo; Vermeulen, Sonja; Leonard, Rebeca & Keeley, James (2009). "Land grab or development opportunity? Agricultural investment and international land deals in Africa," FAO, IIED and IFAD.

Crain Communications Inc. and The Ad Age Group (2008). "Global Marketers," available at: http://adage.com/images/random/datacenter/2008/globalmarketing2008.pdf, read 12/18/2011.

Desjardins, Sylvie (2011) "Macroeconomic Impacts of Prevention Policies for NCDs. Making the Case to the Finance Sector", Public Health Agency of Canada, presented at the Workshop on Economics of Prevention of Non-communicable Diseases and Risk Factors, Pan American Health Organization, November 14 and 15, Mexico City.

Elster, Jon (2007). *Explaining Social Behavior: More Nuts and Bolts*, Cambridge University Press.

Feig, Christy & Shah, Sonia (2011). "Setting the Record Straight on WHO Funding: Debating the Mo ney Behind the Global Public Health Agenda", *Foreign Affairs*, November 18, Available at: http://www.foreignaffairs.com/articles/136687/ christy-feig-and-sonia-shah/setting-the-record-straight-on-who-funding.

Fink, Sheri & Rabinowitz, Rebecca (2011) "The UN's battle with NCDs. How Politics, Commerce, and Science Complicated the Fight Against an 'Invisible Epidemic'", *Foreign Affairs*, September 20, Available at: http://www.foreignaffairs.com/articles/68280/sheri-fink-and-rebecca-rabinowitz/the-uns-battle-with-ncds?page=show.

Fogel, R. W. & Wimmer, L. T. (1992). „Early Indicators of Later Work Levels, Disease, and Death", NBER Historical Working Papers 38, National Bureau of Economic Research.

Fogel, R. W. (1994). "Economic Growth, Population Theory, and Physiology: The Bearing of Long-Term Processes on the Making of Economic Policy". *American Economic Review*, 84 (3), pp. 369-395.

Fogel, R. W. (2002). "Nutrition, Physiological Capital, and Economic Growth". Pan American Health Organization and Inter-American Development Bank. Available at: http://www.paho.org/English/HDP/HDD/fogel.pdf.

Galor, O., & Zeira, J. (1993). "Income distribution and macroeconomics". *Review of Economic Studies*, 60, 35–52.

Galor, Oded and Mayer, David (2002) "Food for Thought: Basic Needs and Persistent Educational Inequality", available at http://www.paho.org/English/HDP/HDD/Mayer-Galor.pdf.

GPES (2009). "Avaliação Econômico-Epidemiológica das Terapias Renais Substitutivas no Brasil," presentation at the Workshop "The Economic, Fiscal and Welfare Implications of Chronic Diseases in The Americas", PAHO, Washington, D.C.

GRAIN (2010). "Land grabbing in Latin America," March 29, available at: http://www.grain.org/article/entries/3995-land-grabbing-in-latin-america.

IDF, IUAC &WHF (2009). *Time to Act: The Global Emergency of Non-Communicable Diseases*, published by the International Diabetes Federation, International Union Against Cancer and World Heart Federation, available at: http://www.world-heart-federation.org/fileadmin/user_upload/documents/Publications/Time%20to%20Act%20-%20High%20Res.pdf.

Kahneman, Daniel (2011). *Thinking, Fast and Slow*, Farrar, Straus and Giroux, New York.

Klein–Geltink J, Choi Bernard and Fry Richard (2006). "Multiple exposures to smoking, alcohol, physical inactivity and overweight: Prevalences according to the Canadian Community Health Survey Cycle 1.1." *Chronic Diseases in Canada*; 27 (1): pp. 25–31.

Lopez-Gamundi, Paula and Hanks, Winston (2011). "Land-Grab Loopholes in Latin America," Worldpress.org August 11, available at: http://www.worldpress.org/Americas/3794.cfm#down.

Mayer-Foulkes, D. (2001). "The Long-Term Impact of Health on Economic Growth in Latin America". *World Development*, 29 (6), 1025-1033.

_____. (2008a). "The Human Development Trap in Mexico". *World Development*, vol. 36(5), pp. 775-796.

_____. (2008b). "Economic Geography of Human Development: Stratified Growth in Bolivia, Brazil, Guatemala and Peru", available at: http://ssrn.com/abstract=1287952.

_____. (2008c). "The Cognitive Transition in Mexico: Economic Geography and Local Governance Impacts", available at: http://ssrn.com/abstract=1303867.

_____. (2009). "Long-Term Fundamentals of the 2008 Economic Crisis", *Global Economy Journal*: Vol. 9: Iss. 4, available at: http://www.bepress.com/gej/vol9/iss4/6/?sending=10919.

_____. (2011a). "A Cross-Country Causal Panorama of Human Development and Sustainability." Available at: http://ssrn.com/abstract=1973450.

_____. (2011b). "A Survey of Macro Damages from Non-Communicable Chronic Diseases: Another Challenge for Global Governance." Global Economy Journal: Vol. 11: Iss. 1, Article 6, available at: http://www.bepress.com/gej/vol11/iss1/6.

McMichael A. (2002). Population, environment, disease, and survival: past patterns, uncertain futures. *Lancet*. 359, pp. 1145-1148.

Méndez-Florián FA (2011). "La Prevalencia de las Enfermedades Crónicas no Transmisibles en el Contexto de Transición Socioeconómica: Un Estudio Econométrico para México", tesina, CIDE.

National Academy of Sciences (2012). *Country-Level Decision Making for Control of Chronic Diseases: Workshop Summary*. Alexandra Beatty & Rapporteur; Board on Global Health; Institute of Medicine.

NCHS (2006). National Health and Nutrition Examination Survey. National Center for Health Statistics, available at: http://www.cdc.gov/nchs/data/hus/hus04trend.pdf#069, accessed 26 May.

Northstone, Kate; Joinson, Carol; Emmett, Pauline; Ness, Andy; Paus, Tomáš (2011). "Are dietary patterns in childhood associated with IQ at 8 years of age? A population-based cohort study", *J. Epidemiol Community Health* doi:10.1136/jech.2010.111955.

Omran, A.R. (1971). "The epidemiological transition: A theory of the epidemiology of population change", *The Milbank Memorial Fund Quarterly* 49 (No. 4, Pt. 1), 1971, pp. 509–538, reprinted in *The Milbank Quarterly* 83 (4): pp. 731–57, available at: http://www.milbank.org/quarterly/830418omran.pdf.

Ong, Z. Y., and Muhlhausler, B. S. (2011). Maternal 'junk-food' feeding of rat dams alters food choices and development of the mesolimbic reward pathway in the offspring. *FASEB J*. doi: 10.1096/fj.10-178392. [Epub ahead of print].

PAHO (2006). "Global Strategy on Healthy Eating Physical Activity and Health (DPAS) Implementation Plan for Latin America and the Caribbean 2006–2007," available at http://www.paho.org/english/ad/dpc/nc/dpas-imp-plan-lac.pdf.

_____ (2007). "Regional Strategy and Plan of Action on an Integrated Approach to the Prevention and Control of Chronic Diseases," available at: http://www.paho.org/english/ad/dpc/nc/reg-strat-cncds.pdf

_____ (2011). Ministerial Declaration, available at: http://www.paho.org/English/D/Ministerial-Declaration-Mexico-NCDS.pdf.

Pescetto, Claudia (2011) "Economic Dimensions of the Impact of Chronic Diseases in the Region of the Americas: A Research Agenda," Technical note prepared for the Workshop on Economics of Prevention of Noncommunicable Diseases and Risk Factors, Panamerican Health Organization, November 14 and 15, Mexico City. Available at: http://new.paho.org/hq/index.php?option=com_content&view=article&id=6232&Itemid=2072.

Pogge TW (2005a). "World Poverty and Human Rights." *Ethics & International Affairs*, Volume 19, Issue 1, pages 1–7, March.

_____ (2005b). "Human Rights And Global Health: A Research Program," *Metaphilosophy*, Vol. 36, Nos. 1/2, January.

Popkin BM (2002) The Bellagio conference on the nutrition transition and its implications for health in the developing world. Italy. 24 August 20-24. *Public Health Nutr* 5(1A): 93–280.

Price D, Pollock AM, Shaoul J. (2001) How the World Trade Organization is shaping domestic policies in health care, *Lancet* 354: 1889.

Sassi, Franco & Hurst, Jeremy (2008). "The Prevention of Lifestyle-Related Chronic Diseases: an Economic Framework," OECD Health Working Papers 32, OECD Publishing. http://dx.doi.org/10.1787/243180781313.

Sassi, Franco; Cecchini, Michele; Lauer, Jeremy; Chisholm, Dan (2009a), "Improving Lifestyles, Tackling Obesity: The Health and Economic Impact of Prevention Strategies", OECD Health Working Papers, No. 48, OECD Publishing. http://dx.doi.org/10.1787/220087432153.

Sassi, Franco; Devaux, Marion; Cecchini, Michele; Rusticelli, Elena (2009b), "The Obesity Epidemic: Analysis of Past and Projected Future Trends in Selected OECD Countries", OECD Health Working Papers, No. 45, OECD Publishing. http://dx.doi.org/10.1787/225215402672.

Sassi, Franco; Devaux, Marion; Church, Jody; Cecchini, Michele; Borgonovi, Francesca (2009c), "Education and Obesity in Four OECD Countries", OECD Health Working Papers, No. 46, OECD Publishing. http://dx.doi.org/10.1787/223688303816.

Savedoff, W. D., & Schultz, T. P. (Eds.) (2000). *Wealth from Health: Linking Social Investments to Earnings in Latin America*. Washington, DC: Inter-American Development Bank.

Self-interest, altruism, myopia and foresight, beliefs, emotions; collective belief formation, action and decision making.

Shah, Sonia (2011). "How Public Health Companies are Transforming the Global Public Health Agenda: A New Era for the World Health Organization" *Foreign Affairs*, November 9, available in: http://www.foreignaffairs.com/articles/136654/ sonia-shah/how-private-companies-are-transforming-the-global-public-health.

Thomassin, Paul (2011). "Impactos macroeconómicos de políticas de prevención para las enfermedades crónicas no transmisibles: Creando el caso para el sector financiero," University of McGil, presented at the Workshop on Economics of Prevention of Non-communicable Diseases and Risk Factors, Pan American Health Organization, November 14 and 15, Mexico City.

UN (2011). "Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases," document A/66/L.1, available at http://www.un.org/ga/search/view_doc.asp?symbol=A/66/L.1.

Wahdan, M.H. (1996). "The epidemiological transition" *Eastern Mediterranean Health Journal*, vol. 2, Issue 1, Page 8-20.

WHO (2002). *Globalization, Diets and Noncommunicable Diseases*. Geneva: World Health Organization.

_____ (2005). *Preventing Chronic Diseases: A Vital Investment.* Geneva: World Health Organization.

_____ (2011). *Impact of out-of-pocket payments for treatment of non-communicable diseases in developing countries: A review of literature.* Discussion Paper No 2. Geneva.

Williams, Dylan C. (2006). "World health: A lethal dose of US politics", Asia Times online, Jun 17, available at: http://www.atimes.com/atimes/Southeast_Asia/HF17Ae01.html.

WTO & WHO (2002). *WTO Agreements & Public Health*, printed by the WTO Secretariat, available at: http://www.wto.org/english/res_e/booksp_e/who_wto_e.pdf.

Yach D, Beaglehole R (2004). "Globalization of risks for chronic diseases demands global solutions." *Perspectives Global Dev Technol* 3(1-2): 213–33.

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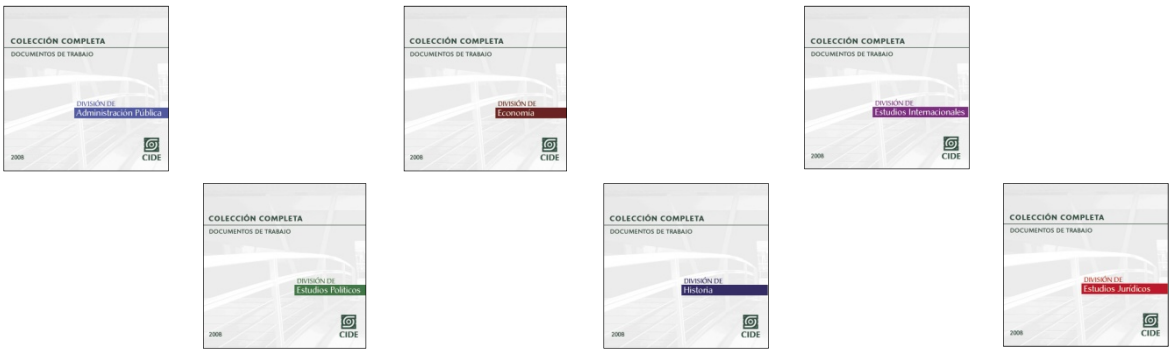

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