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Multidisciplinary Center for Advanced Studies
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International Observatory of Human Capabilities, Development and Public Policy

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International Observatory of Human Capabilities, Development and Public Policy

Organization of the Collection
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Valdemar de Almeida Rodrigues
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International Observatory of Human Capabilities, Development and Public Policy – linked to the Center for Public Health Studies, Multidisciplinary Center for Advanced Studies, University of Brasilia, and to the Center of Studies on Bioethics and Diplomacy in Health, Oswaldo Cruz Foundation

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Sumário

Presentation

This publication is the result of a cooperative effort between the Observatory of Human Resources in Health of the University of Brasilia and the Center of Studies on Bioethics and Diplomacy in Health of Fiocruz, which aims to promote a critical approach to relevant issues that usually relate to human resources, health, development and inequalities. This purpose was possible with the collaborative project of the International Observatory of Human Capabilities, Development and Public Policy, implemented in 2012, with the support of the Pan American Health Organization, through the cooperation agreement between the agency, Fiocruz and the Ministry of Health[1].

The approach to this thematic universe is based in the meaning of Amartya Sen on the human dimension of development, which recognizes health, education and social security as essential conditions to ensure the freedom of people to choose what they want to be and do; i.e., a vision of development, which aims to prevent serious personal privations and promote social justice, distanced from other interpretations, in which health and education are mere instruments of survival and maintenance of healthy and well-skilled workers.

The first edition of the series of studies and analysis of the International Observatory of Human Capabilities, Development and Public Policy addressed trends in health, education, labor, social security and the environment in selected countries. The intention was to stimulate controversy to the fact that economic and social development would be taking place towards the creation of a plurality of lifestyles freely chosen by people.

This collection of texts aims to strengthen this debate, focusing again on two issues raised in the presentation of the previous issue: the

1 Brasil. Ministério da Saúde. Extrato do 41º Termo de Cooperação e Assistência Técnica ao Ajuste Complementar. Diário Oficial da União, Brasília, DF, 10 jan. 2006. Seção 3.

vocation of capitalist development, as occurs in Latin America and other continents to inevitably impose certain standardized and controlled styles to live in society, were there is not the unveiling of the horizon of freedom promised by Sen's theory; and the impression that often this horizon of freedom is definitely made not viable by the type of development imposed unilaterally by the State, a phenomenon that can occur in both contexts of authoritarian as democratic regimes.

The editorial orientation of the first report was maintained in the current issue, without previously defining for the analysis the theme proposed to guest authors, so that they could presented contributions from their own point of view. However, the new cast of subjects sets an axis of approach that refers to a discussion of specific health and environment problems, whose confrontation is in the core of the discussion on development and public policies: Environment and Bioethics; Health and Agrochemicals; Medicalization; Smoking; Alcoholism; Industrial Food; Risk Factors Regulation; Health and Freedom; Health Promotion; People with Disabilities; and Drug Policy. The sequence of these contributions begins with an appreciation of the development process that portends for Brazil in the post-2010 international scene.

The intention of the coordinators of the editorial project is to explore new perspectives on the discussions that followed the inaugural publication of these studies and analyzes[2]. The organization and the release of this publication in a seminar that brings together the authors for the presentation and discussion of their work with special guests confirm the willingness of the Center of Studies on Bioethics and Diplomacy in Health of Fiocruz and the Observatory of Human Resources of UnB to proceed in the consolidation of the International Observatory of Human Capabilities, Development and Public Policy.

The expectation is that the broad dissemination of texts and discussions via internet will contribute to the critical renewal of approaches regarding the discussions about development, health and inequalities, defending long-term commitments on the social purpose of development,

2 OICH. **Observatório Internacional de Capacidades Humanas, Desenvolvimento e Políticas Públicas:** estudos e análises. 2015. Available at: http://www.capacidadeshumanas.org/. Access on: 9 jun. 2015.

fight against inequalities and the tenacious vigilance against the perpetuation or revival of these inequalities in renovated formats in the health field.

This agenda interests the international community as a whole, but has a special meaning for countries like Brazil, which aspire to a more just insertion than the current one in the global economic system, in which occupy positions marked by the subordinate and vulnerable character as mere sources of commodities. The optimistic outlook of an integrated, economic and social development, which emanated from the reports of the first publication of the Observatory, is gone, confirming the cautious conclusion expressed at the time that the favorable conditions of the first decade of the new millennium would not last without a solution to the impasse of world capitalism.

This cautious evaluation is in the article of Guilherme Costa Delgado, which presents an interpretive framework for Brazil in the macroeconomic and social context of international relations in the post-2010. The author highlights the reversal of favorable external relations to the "axis of commodities" and the specialization of this external trade component with China, linking this reversal to the financial crisis, whose epicenter was located in the US economy in 2008. Its prospective evaluation considering the current crisis of the Brazilian economic and social development would be optimistic if the country decided to opt for solutions such as green economy and low-entropy energy production, but the author warns that this is still a marginal option in the official agenda of the Brazilian State.

The other contributions to this publication contribute to the health agenda of international politics in the post-2015 context, focusing on health conditions, and not on the analysis of systems and services. Another bias purposely assumed corresponds to a particular emphasis on chronic diseases, which is not a preferred option compared to the institutional organizational perspective in the health field, somehow treated in the first publication of the series of studies and analysis of the Observatory of Human Capabilities, or the issue of infectious or acute diseases that affect mankind, which may be adopted as a scope of future editions.

Despite the focus on chronic conditions, the introductory appreciation of this publication is not intended to explore complementary or opposing aspects between the various copyright contributions, given the

diversity of themes and approaches caused by the editorial orientation previously referred. The summary of the chapters presented next seeks only to encourage the reader to weave, on its own, the connecting wires between the issues debated.

José Roque Junges reinterprets the classic vision that puts health in opposition to illness, in a way that diseases would be considered adversities underlying health itself, advocating the importance of environmental and socio-cultural factors, particularly in the case of chronic diseases. It deplores the precedence of emergency situations in relation to chronic health problems, because their monitoring "responds to the true meaning of a complex biological reality that is defined in its complexity by its interactions with the environment that make it reorganize itself continuously due to their answers regarding changes in their environmental conditions".

In the essay on pesticides and health, Raquel Maria Rigotto and Ada Cristina Pontes Aguiar emphasize that the toxicity of numerous ingredients used extensively in modern agriculture is well established in the scientific literature. However, "social invisibility" of the impact of these disease processes on the profiles illnesses and deaths is a barrier difficult to overcome, a serious problem that needs to be urgently addressed worldwide, especially in the case of Brazil, which is becoming one of the largest producers of food and leader in the intensive use of pesticides. The message of the authors is that the mantra that propagates the virtues of development based on modernization of agriculture fueled by toxic pesticides must be unmasked, leading the government to adopt protective measures of the environmental ecosystem, of workers and the general population.

José Ruben de Alcântara Bonfim discusses different alternatives in the understanding of chronic disease, medicalization and iatrogenesis in order to draw attention to excesses and mistakes in addressing these issues, and worse, the care of affected people. About this, the author offers impressive information: only one in ten people with chronic diseases is treated successfully. The term medicalization is still controversial, coexisting interpretations from sociological, biological or biopsychosocial approaches in specialized literature. The author indicates his preference for the meaning that says it is the conversion into disease processes of situations

consensually seen as normal or part of life, which become objects of medicine, in an era in which biology and genetics are seen as the main forces that affect human life, with social factors playing a minor role. He continues characterizing the iatrogenesis as any disease or morbid state, in the physical or psychic sphere, due to medical intervention, correct or not, justified or not, that results in harmful consequences for human health, including diseases diagnostics that never cause symptoms or deaths.

As to smoking, José Agenor Alvares da Silva recalls that the use of this drug was something that referred to an imaginary of a good life, adventure and charm, an illusion unmasked after the evidence of the catastrophic effects of smoking, which exceed the rates of death from traffic accidents, alcoholism and suicide combined. It is an addiction characterized by physical and psychological dependence on nicotine consumption, included in the group of mental and behavioral disorders resulting from the psychoactive substance use, according to the Tenth Revision of the International Classification of Diseases (ICD-10). The author admits a relatively optimistic expectation, since research has pointed to a decrease in the prevalence of smoking in Brazil and other parts of the world. However, it recognizes that there is still a long way to go in this direction.

Consuming excessive amounts of alcohol in a short time is a practice associated with physical, social and mental problems, constituting a relevant public health problem. Deborah Carvalho Malta has extensive argument about it, as a result of important advances in the monitoring of these issues, whose basic evidence is scandalous: about 2.5 million annual deaths worldwide are associated with the use of alcohol. Accidents involving motor vehicles are at the top of the long list of these malefaction, including violence and accidents in general, alcohol intoxication, unsafe sex, unplanned pregnancies, sexually transmitted diseases, HIV, diseases that affect predominantly young populations. Furthermore, the use of alcohol is a risk factor for the use of other drugs, such as tobacco and illegal drugs. The author emphasizes the importance of the debate involving the different segments of government, health and education professionals, social groups, families and young people for the advancement of public policy and regulatory framework for alcoholic beverages.

Carlos Augusto Monteiro and Maria Laura da Costa Louzada address the implications for public policy regarding the association between ultra-processed food and chronic diseases. The focus of the debate is the new eating pattern, driven, among other factors, by dramatic changes in production, distribution and consumption systems of food around the world and by increased morbimortality from such diseases on a global scale, with special intensity in low- and middle-income countries. The authors argue that a possible reversal of these trends, in the current national and international scene, could be achieved by concatenated public policies regarding measures such as adopting dietary guidelines; promotion, protection and support actions for breastfeeding; promoting healthy eating at school; ultra-processed food advertising regulations for children; and fiscal policies.

Lynn Silver writes about the discussion on the regulation of risk factors for chronic diseases. She points risk factors related to social inequality, to food, tobacco and physical inactivity, indicating some recommendations on the challenges ahead, based on the North-American experience. Her initial argument is that the current situation in heart and lung diseases, diabetes and cancer is a result of pyramids of social inequality, social and technological change and deep economic interests and that, despite the huge medical and technological progress achieved, the obstacles to change this situation require more than new miracle drugs, which often make people dependent on invasive medical treatments or expensive drugs. That is, it is necessary to examine more closely the constitutive elements of chronic diseases and rebuild the understanding about this field. The author draws attention to the four main risk factors: unhealthy diet, smoking, physical inactivity and harmful use of alcohol. She highlights the great efforts of the public health community over the last decade in the United States to overcome approaches of limited effectiveness focused on educational proposals to modify individual behavior, giving greater emphasis on environmental risk determinants of chronic disease. However, she recognizes that this change occurs unevenly and with limited scope, since it requires building a broader social consensus capable of generating the desired changes, and outlines three key barriers of this process: financing, which, although very significant in that country,

does not include activities of prevention of chronic diseases as a priority; the training of human resources in the public health system and partner agencies, mainly the regulatory capacity in this area; and finally the political will to tackle economic interests that benefit from the status quo around the issues of production and consumption of food, tobacco and alcoholic beverages and habits related to physical activity.

The text by Roberto Passos Nogueira remits to a meditation on the thesis of Amartya Sen, according to which health is related to the range of effective choice opportunities to achieve the objectives that people wish to enjoy, i.e., the notion of health closely linked to freedom. Nogueira proposes to polemicize this referential referring to authors such as Kierkegaard, Tillich and Heidegger, who consider freedom an ontological property that characterizes the finitude and imperfection of the human being, closely linked to chronic diseases; and that perfect health cannot be prescribed nor imposed, requiring deeper analysis of the human being as a whole and in relation to the environment in which he lives. To place this essay at the center of the chapter list evokes Carlos Drummond de Andrade's warning of that in the middle of the road was a stone, and at the same time, it is a provocation to the debate, proposing to explore a way in the middle of the stone.

Luis David Castiel proposes an uncomfortable reflection on health promotion based on improvement technologies for the pursuit of a perennial vitality. The discomfort is triggered with the doubt on the notion that we are autonomous individuals, able to establish cost/benefit relationships in exchanges in the world in which we live. It gets worse as it faces the author's speculations about the unawareness of a "futurized" present promised by such technologies, disseminated as consumption products in the logic of capitalist development, and the inequality engendered in this process, whose indicator is based on the notion of preemption, as a possible precedence of some in accessing these technologies over others, or many others, or ultimately, considering the negative side of precarization and human suffering of huge contingents of excluded. Finally, Castiel stresses the reader when he states that concerns about longevity and immortality are symptoms of primal fear of death turned into demonstrations that serve the commodification of that fear.

The approach of Wederson Santos on the challenges of social policies for disability in Brazil is based on the premise that this term does not refer to a nature construct that demarcates a personal identity, but rather expresses a social, historic and political relationship of power that inscribes the bodies with variations in inequality and oppression situations. The author tells the evolution of these policies in recent decades, contextualizing the Brazilian insertion in this debate and in regulatory formulations in the international arena; and highlights the publication by the WHO of the International Classification of Functioning, Disability and Health (ICF) in 2001. It emphasizes the assessment of the consequences for a person's life of a condition that can lead to restrictions of his freedom. Although it recognizes the important progress made in Brazil after the 1988 Constitution, Santos believes that public actions aimed at disabled person still face difficulties linked to inescapable requirements of interdisciplinary and intersectoriality in formulating and implementing these policies in order to meet the enormous diversity of the demands of these people.

The final chapter of the book presents the reader with the challenge of a new way of thinking about drug policy and framing the future in this area. Denis Russo Burgierman starts saying that the use of psychoactive substances is an anthropological constant, i.e., it exists since always, in virtually all human groups, and that living with this situation was marked by a regulatory guidance of cultural nature until the beginning of last century. That is when began a policy to ban and criminalize the use of these drugs, which progressively infected everybody. Burgierman exposes extensive discussion around the two schools of thought that have dominated public policy on drugs in the second half of the twentieth century: the War on Drugs (WD) and the Harm Reduction (HR). Finally, he discusses the latest trends of easing the dominance of combat strategy, as a sign of a transition that moves towards new regulatory approaches.

Concluding this presentation, remains the hope that the preparation and dissemination of this publication will contribute to better understand, evaluate and guide decisions about the problems that are part of the debate on international relations, helping to clear up topics relevant to the future of humanity health, in the case in question, diseases and chronic conditions. The renewed hope that the shocking omen of Dominique

Kerouedan[3] does not represent a final condemnation remains. "Neither altruism nor philanthropy explain the concern of the great nations with global health, but economic, geopolitical and security interests."

That each reader can draw his own conclusions and choose a side.

José Paranaguá de Santana

3 Kerouedan, D. **Os interesses das grandes potências: como a saúde se tornou um desafio geopolítico**. Le Monde Diplomatique Brasil, São Paulo, 2 jul. 2013. Available at: http://www.diplomatique.org.br/artigo.php?id=1463. Access on: 8 jun. 2015.

Guilherme Costa Delgado

Brazil post-2010: economic, social and relevant external relations analysis

Brazil post-2010: economic, social and relevant external relations analysis

Guilherme Costa Delgado

Subject of analysis and preliminary justification

In this seminar, sponsored by the International Observatory of Human Capabilities (OICH), focuses on a specific period to analyze the economic and social situation in Brazil in particular and its relevant external relations in this context, particularly in the group of BRIC countries (Brazil, Russia, India and China).

In 2013, the OICH also promoted a similar seminar, establishing a historical period - the decade 2000-2010. In both cases, the historical choice is not justified strictly by calendar reasons, but it tries to capture and interpret certain cycles of significant foreign economic relations. In the first case, because of the emergence of a clear movement of "primarization" of external relations, characterized as the axis of an engaging political economy (2000-2010). In the present case (post-2010), by signaling a reversal of this previous cycle, with all the conjuncture characteristics and multiple crises, such as we live in the present.

The contrast of these two periods is too relevant. In a way, it continues and deepens a critical-interpretative approach about the period of apparent economic boom to reveal now the "feet of clay" of the economic growth driven by "natural comparative advantages" in foreign trade, peculiar feature of the first decade. In this second decade, there are obvious signs of cyclical reversal that we need to characterize with certain severity, bearing in mind that its critical character does not manifest yet a new trend of political economy rearrangement. However, the social and political consequences are visible in the sense of economic stagnation and socio-economic development indicators.

Background

In the 2013 seminar, we synthesized 13 items, which analyzed on different approaches the situation in Latin America and for the BRIC countries in the decade 2000-2010. A focal point of all analysis of this situation is the so-called China-effect, i.e., the expansion of the Chinese economy, projected on a global scale, pulling the Latin American economies for economic growth, linked to the primary-export insertion of these countries in world trade.

With few exceptions, there is also a strong convergence in the empirical-analytical approaches to indicate that for the countries of Latin America and the BRIC occur simultaneously:

1. Widespread improvement in labor markets, with growth of employment and decrease of unemployment;
2. Absolute improvement in the Human Development Index (HDI) of almost every country;
3. General improvement in income distribution rates;
4. General improvement in education rates;
5. Demographic changes typical of economic development;
6. Widespread changes in the public health field - changing the epidemiological profile of the population and an increase in health expenditure per capita; improvement in life expectancy at birth etc.;
7. Gross Domestic Product and exports growth of almost every country.

In the interpretation of this growth process and peculiar external insertion, there is a diversion on the continuity as well as on the social and environmental implications of this type of expansion.

However, there is also convergence in findings that

o aprofundamento do modelo primário-exportador seria fatal para o desenvolvimento econômico e a igualdade social em médio prazo. Mesmo no curto prazo, admite-se que uma vez interrompido o fluxo e o ritmo da demanda

(mundial) por "commodities", haveria efeitos perversos ao crescimento econômico (Delgado, 2013).[1]

The current period (post-2010): cyclical crisis, worsening economic indicators and stagnation of social indicators

The sign of cyclical change in world economy, signalized by the financial crisis in the US economy in 2008, reflects in a lagged and differentiated way throughout the world economy since then. First, in the US economy, which answers immediately with a huge program of "financial restructuring", supported by public debt issuance at very low interest, followed by strong currency issuance - quantitative easing - as a way to pay off parts of this debt. This US monetary policy affects the world exchange rates, particularly the real-dollar relationship, contributing to the loss of competitiveness of our exports in the latest period.

The European economy, in turn, will experience its own entrance in the financial crisis due to the situation of several countries in the Eurozone - Italy, Greece, Portugal and Spain - with tax problems, internal bank delinquency and external moratorium potential. There is an aggravating. These Member States no longer have, within the EU, public debt in their own currency and / or currency issuance as self-defense mechanisms.

The relative stagnation of the US economy from 2008 to 2013 (GDP average growth rate of 0.94%) and of the countries of the Eurozone in the the same period (average growth rate ranging from a maximum of 0.65% for Germany and 0.1% for France and Italy) certainly influenced the Chinese economy (average growth rate in 2012-2014 of 7.7%), strongly decelerated if compared to the period 2004-2010 (11.1% per year) [2] (primary data in Table 2 and specific analysis in the section "Some indicators of the world economy").

1 The deepening of the primary export-oriented model would be fatal for economic development and social equity in the medium term. Even in the short term, it is assumed that once interrupted the flow and pace of the demand (worldwide) for commodities, there would be negative effects on economic growth.

2 From 2011 to 2014, the IBRE-FGV Commodities Price Index, which covers 23 products, fell 18.7%, driven by oil, iron and soybeans.

The effect of the external crisis on Brazil is characterized by the reversal of the exchange ratio of commodities, whose explicit manifestation took place from 2013.

In Brazil, the 2008 crisis figured initially as mere cyclical fluctuations - a "small wave", as they called it back then. It received an important countercyclical response during Lula's second mandate, in the form of an extensive investment program with public funds and continuity of primary exports, supported respectively by Petrobras, the electric system and BNDES-National Treasury, on the one hand, and the Rural Credit National System, on the other. The expansion of consumer credit has also integrated this list of incentives to support domestic demand.

Effective at first to contain the beginning of the financial crisis in 2008-2009, with showy economic results in 2010 (GDP growth of 7.5%), the countercyclical measures started losing effectiveness over President Dilma's first mandate between 2011 and 2014. By the beginning of the second mandate, they were abandoned in the name of a conventional fiscal adjustment, led by Finance Minister Joaquim Levy.

Observed from a strictly empirical point of view, the period 2011-2014, which coincides with the first term of President Dilma, already manifest a clear movement of economic slowdown, with average GDP growth in the four years of 1.9% per year, compared to an average of 4.6% for the previous four years (2007-2010) or 4.5% on average in the period 2004-2010.

The year 2015 is symbolic because it explicitly express the various critical tensions of growth style in reversion process, but still not admitted by the official policy. It emerges as autonomous factors: 1) a clear reversal in commodity prices, with significant worsening of the current account deficit with foreign countries; 2) a manifest shortage of drinking water for urban supply and hydroelectric production; 3) a political and economic crisis in the Petrobras system; 4) a configured fiscal crisis, with explicit manifestation of the financial system - to deny the continuity of the countercyclical policy of the BNDES-National Treasury, financing the so-called PAC (Growth Acceleration Program).

The conjunction and simultaneity of these four economic contraction factors invalidate the countercyclical program of Dilma's first mandate and the tangible possibility of immediate economic growth (2015-2016). This is due, as we analyze in sequence, the cyclical and structural problems raised autonomously by the mentioned crises and circumstantially by the fiscal adjustment policy now underway.

Changes in commodities cycle

The world economy contraction and particularly the slowdown of the Chinese economy strongly affect external competitiveness of some Brazilian manufactured and semi-finished exports, responsible for more than half of the export basket - the main ones: crude oil, iron ore, aluminum, sugar, soy, corn, meat, coffee and pulp. Because of that, the foreign trade balance in the last two years was practically zero and the current account deficit with foreign countries was very high in the same period, around 4% of the GDP.

A particularly strong reversal in oil barrel prices, iron ore and soybeans, since mid-2013 - three icons of the external competitiveness of the oil fields, mining and agribusiness land - significantly reduced exports to China, while in Latin America the effects of the external crisis and the internal problems of the Mercosur countries also led to trade reduction.[3]

The classic argument of the natural comparative advantages of Brazilian commodities in world trade virtually configured the axis of Brazilian economic expansion from 2000 to 2010. This advantage resulted in extraordinary profit given to commodities by a peculiar endowment of natural reserves of crude oil, water resources, arable land and mineral deposits during the period of strong expansion of external demand.

The sharp fall in international prices of commodities significantly reduces this extraordinary profit, a fact that apparently would alleviate the tendency for intensive and extensive exploitation of natural resources.

3 For a detailed situational analysis of foreign trade see FGV-IBRE (2015).

However, for purely commercial criteria, this is not guaranteed in an economy that has been specializing in raw materials for foreign trade.

At this juncture (2015), the explicit manifestation in the metropolitan areas of the Southeast, Midwest and Northeast of a water crisis - lack of drinking water for urban consumption and lack of accumulation of water for hydroelectricity generation - highlights the need to establish limits for water management, use and consumption. This criterion somewhat clashes with the belief of the natural comparative advantages as mechanical competitiveness source of international trade.

The water crisis shows visibly the so-called invisible costs of strictly commercial exploitation of land, water and mines. The implicit assumption of overabundant natural resources, to be converted into commodities, cannot be sustained. Emerging climate change in the same period show, in that case of water scarcity, a structural limit to the continued expansion of this style, not to mention the other components of the overexploitation of natural resources - waste, contamination, biodiversity loss etc., also assigned to the list of hidden costs.

Fiscal crisis and adjustment

In recent international public pronouncement (meeting of heads of state of the Americas in Panama, from April 10 to 12, 2015), President Dilma explicitly mentioned the strategies of a countercyclical program, exhausted in 2014, and of the fiscal adjustment policy, opposed in 2015, to cover a larger fiscal crisis allegedly due to economic cycle changes in the world economy. The fiscal crisis would figure here as negative fact of foreign origin and the programs of action a form of different internal therapies to treat it. In fact, we have here an official version, with all the half--truths convenient to the official discourse.

For the reader not used to the economic jargon, these expressions sound strange and need to be decoded, especially when on their behalf people are trying to adopt political actions with strong impact on social life.

In 2015, after at least six fiscal years (2009-2014) of successive countercyclical operations of contributions from the National Treasury to BNDES for financing of various investment lines of the Bank[4], they abruptly ended these operations and initiated the policy called fiscal adjustment in the second Dilma government, whose premise is to combat the strong imbalance in the public accounts.

Without considering for the moment the merits of this fiscal adjustment as appropriate remedy to the fiscal crisis, it seems that the obvious economic fact is the very fiscal crisis on the one hand, and, on the other, a source of controversy - how to face it through economic policy.

In turn, the strategy of cutting public investment (fall of BNDES loan funds), reducing social spending (MPs 664, December 2014, on pensions, and 665, from the same period, about unemployment benefits and allowances salary), canceling pension tax relief and increasing certain taxes and tariffs (electricity and petroleum fuels) has a clear sense of programmed demand contraction, to which are added two other unscheduled movements: i) the crisis in the Petrobras system and partner companies of the chains of inter-industrial relations; ii) the fall in exports of commodities caused by the reversal of the terms of trade of these goods. Combining programmed with non-programmed effects of contraction of domestic and external demand, the so-called fiscal adjustment produces a very negative result on production and employment, [5] something that, according to economists in favor of planned measures, such as the former Minister of Finance Delfim Neto, would be inevitable to adopt. Otherwise, the markets themselves would perform a much more radical fiscal adjustment. Probably the former minister is referring to an external speculative attack, with capital flight and deep currency crisis, like what we observed in 1982 (industrial recession) and 1999 (the attack to Brazilian currency real at the beginning of the Fernando Henrique Cardoso government).

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4 Between 2009 and 2014, the Treasury borrowed for the BNDES loan funds and other public banks an amount of over 400 billion reais (or US$ 127 billions), with the issuance of government bonds. Converted into long-term financing, this money would also be paid in the long run.

5 The result of the GDP in 2015 will be negative, according to all expectations, but it is uncertain how strong (see data - Tables 1 and 2). The implications for employment are felt indirectly by the labor market downturn.

Apparently, defending the fiscal adjustment would reflect a state of necessity, something the operators sooner or later would end up doing.

However, those who defend the adjustment strategy operate at the limit of pure instrumental rationality, under the argument of balanced budget with a primary surplus to pay interest. This technical discourse is seen, ideologically, as a belief in correcting the distortions imposed by the State interventionism, to be operated by market forces, and as certain theological idolatry appeal to sacrifice the weakest ones socially and economically, a punishment that, by the end of a certain period, would bring back the "animal spirit" of entrepreneurs. As a reward to such expectation would emerge, as phoenix from the ashes, an animal entrepreneur, to take investment decisions to rebuild the battered economy.

Whatever the economic theories and theologies underlying fiscal adjustment, two important questions arise: 1) there is no civilized coexistence in deep and prolonged economic recession environment; 2) the fiscal crisis, in fact, pre-existing, can worsen exponentially because of the therapeutic economic adjustment itself, especially if it does not contain any ethical principle of economic justice to guide it.

In order not to fall into the tautological trap of fiscal adjustment as end in itself, it is necessary to inquire about the nature of the fiscal crisis that leads to it, which is also of foreign economic relations and the very essence of the model of growth implemented in the previous decade (2000- 2010).

Note that since 2008 it is clearly outlined the inadequacy of the Brazilian foreign trade strategy to specialize in the export of commodities. Since then, exports of manufactured goods have shrunk – in a relative or general and absolute manner, for some sectors. The country has a deficit in current account continuously growing, evolving from about 1% to over 4% of GDP in eight years. Foreign investment covers all the years this gap, but it does not substantively address external dependency. It addresses the specialized growth sectors, which both in the first decade as during the period of countercyclical policy (2011-2014) continued to rely on natural comparative advantages in foreign trade and investment in infrastructure that could turn them attractive in locational terms.

In turn, the countercyclical program of effective demand defense, put in place from 2009, under the aegis of BNDES – National Treasury, Petrobras and electrical system in the component -, PAC, the mining sector and the Rural Credit National System - and BNDES, regarding agricultural commodities - had as basic assumption one exchange ratio between price commodities and manufactured prices strongly favor to the first ones.

The cyclical reversal of foreign exchange relationship, which began after 2010 and was clearly set in 2013, radically affects two basic components of growth model: 1) the rise in current account deficit with foreign countries, a thermometer of external dependence; and 2) the stagnation of GDP growth, in part for the loss of external dynamism, in part by the erosion of internal profitability of public and semi-public investments linked to the axis of commodities.

At this perverse interaction of dependency and economic stagnation, the economic policy reacts with a countercyclical program of support of the domestic demand based on a variety of public funds without causing growth and at the same time increasing external dependence. From this to the current fiscal crisis is a step.

The so-called countercyclical program generates a gross public debt and fiscal and financial subsidies. To stop this gross debt from turning into a net debt and these subsidies do not become fiscal spending without tax coverage, there needs to be economic growth, able to raise the various sources and forms of government revenue. However, once installed the fiscal crisis, the way to fight it makes all the difference because factors of dependency, stagnation and social inequality that implicitly push the system to the fiscal crisis cannot be solved either with fiscal adjustments or even orthodox countercyclical programs, because they have no relation with overcoming structural factors of underdevelopment.

Social development indicators – 2011-2014

The period of analysis from 2011 cannot be considered a continuation of the previous cycle, for the reasons presented in previous sections. However, it still contains no clear empirical evidence of reversal of develo-

pment indicators of the business cycle, especially in the social field. Considering some macro growth indicators and recent development (2011-2014) - GDP, HDI, unemployment rate, Gini index of income distribution and evolution of the economically active population (see Table 1), the available statistics is still precarious.

Table 1 Some socio-economic indicators for the period (2011-2014) – Brazil

Years Indicators	2011	2012	2013	2014	2015 (conjectures)
GDP – real growth rate (%)	3.9	2.7	1.0	0.1	Negative
HDI – Brazil (index)	0.718	0.742	0.744	-	-
Unemployment rate – PME-IBGE (%)	6.0	5.5	5.4	4.8	Above 5.5 cf.
Gini index of income (PNAD)	0.506	0.505	0.501	-	-
Economically active population (level detected in millions of people)	99.0	99.5	101.9	-	-

Source: FGV, 2015; IBGE, 2014, 2015.

Obs.: HDI data until 2013 are available on the internet.

What is evident from the empirical analysis (Table 1) is the stunting of economic expansion from 2012, because of the explanatory factors already analyzed. The GDP indicator from 2012 is clearly falling, especially compared to the 2004-2010 period (see data in Table 2).

In turn, employment indicators (unemployment rate and level of economically active population), income distribution (Gini index of all income identified by the PNAD) and the Human Development Index (HDI, consisting of monetary income indices, basic education and health) deserve special analysis.

The labor market has slowed down in terms of net jobs created each year, but the net inflow of new workers into the labor market, according to the evolution of the economically active population and the unemployment rate, does not characterize unemployment growing. Perhaps in 2015

yes, but for other reasons, in a certain way independent from the economic cycle.

Despite the observed drop in GDP from 2012 to 2013, the Human Development Index has not fallen, reflecting improvements in educational and health indicators of that index. Finally, the Gini coefficient of the distribution of labor income and benefits of social policy, which is what the PNAD effectively identifies, has not worsened and remained almost stable between 0.506 and 0.501 (slight improvement).

Apparently, demographic conditions in the labor market and the maintenance until 2014 of the contributions of state social policy lightened the weight of the economic downturn on the living conditions of the population. However, if there were abrupt change of economic policy and social policy, probably the results would be others.

Some indicators of the world economy

For didactic purposes, we selected in Table 2 a common indicator to 12 countries that maintain relevant trade and financial relationships with Brazil - the GDP growth rate in the periods 2004-2010 and 2011-2015. The countries, as shown in the table, are: a) the BRICS group (Brazil, Russia, India, China and South Africa); b) The United States of America; c) the top three in the Eurozone (Germany, France and Italy); d) three relevant in Latin America (Argentina, Venezuela and Chile); e) Japan.

The purely statistical analysis of the economic performance and external trade of different groups of countries has little significance. We must resort to reactionary movement to external financial crisis, recovering the arguments of the beginning of this section. For the US economy, protagonist of the global economy, the relevant analytical cut is from 2008 to 2013, when GDP grew an average of 0.94% per year and, in a way, pushed the entire global system for recession or economic slowdown. The Eurozone countries, even in the most recent period of 2011-2015, are the most affected by the financial crisis, carrying since then effects of low growth - Germany and France, in a range of 1 to 1.5% per year, while coun-

tries of southern Europe, represented here by Italy, remain in recession for almost eight years already.

In turn, the BRICS differ in the cases of China and India, which slowed their growth rates before and after the financial crisis, ranging from 11 and 9% per year, respectively, to the current levels (2011-2015) of 7.8% and 6.7%, respectively.

The other members of BRICS - Brazil, Russia and South Africa -, the Latin Americans, especially Argentina and Venezuela, and mainly the countries of southern Europe (Italy, Spain, Greece, Portugal and Ireland, not listed in Table 2, except for Italy) are the main victims of the post--crisis adjustment process. We are here excluding African countries and the Middle East, victims of religious and civil wars or foreign occupation, but we cannot ignore them at all, because here also arises a human problem, which is not new, but aggravated by the economic crisis: forced mass migrations to Europe.

In summary, taking into account the indicators of economic growth, it is possible to say that the world economy has changed the pattern of expansion of the first decade and apparently is heading towards regional and not global arrangements in the coming years.

Conclusions and perspectives

The period under analysis (2011-2015) is characterized by the reversal of external relations favorable to the axis of commodities, which led, in the previous decade, the expertise of Brazilian foreign trade, particularly with China.

In a sense, one can attribute this reversal to a secondary wave effect, arising from the financial crisis, whose epicenter was located in the US economy in 2008, with financial repercussions for the European and world system, subsequently, although with peculiar characteristics for each group of countries.

In the Brazilian economic system, defense against external crisis, in 2009, took the form of a program of public investment and incentives to consumption that generated at first countercyclical response (2010-2011);

then, semi-stagnation (2012-2014). In the meantime, there is the so-called fiscal crisis and the federal government, pressured by financial markets, reverses its multiple and heterogeneous actions, called countercyclical, to adopt a conventional policy of fiscal adjustment.

In addition, both the countercyclical policy adopted during Lula's second term and Dilma's first mandate and the government's fiscal adjustment during Dilma's second term operate under the assumption of a scenario of restoring economic growth, potentially anchored in the same sectors that played it out in the previous decade.

However, the multiple crisis manifested in 2015 - external exchange relations, fiscal, of water resources and of the Petrobras system - draws attention in particular to the impossibility of this path of primary-export specialization.

Finally, the social development indicators, while stagnant, do not show yet clear signs of deterioration. Due to growing crisis, the political economy faces on the one hand the discourse of the new pattern of development and, on the other, the threat of prolonged stagnation - or even the instable attempt to restore the previous standard of the commodity axis.

In foreign relations, an innovation: new relationships with the BRICS, especially with China, with the creation in 2014 of a common monetary stabilization fund and a development bank of the block, unfortunately, not yet operating.

Even in external relations, agreements on climate change set out in Quito (2014), with a promise of ratification in Brussels (December 2015) on limits to world oil consumption, gas and coal by 2030, can reconfigure external relations in the world economy friendlier to the environment.

Finally, there are the signs of innovative opportunity that the current crisis indicates to the economic and social development in the near future. Certainly, they are present in several ways of ecological economics, agroecological farming, low-impact energy production (low entropy) etc., but this is still very marginal on the official agenda of the Brazilian state.

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Appendix

Table 2. GDP growth (%) for some great partners of Brazil – 2004-2010, 2011 and 2015

Anos	2004/2010 taxa média anual (5)	2011	2012	2013	2014	2015(*)	2011 - 2015 Média
Países							
Brasil (*)	4.4	2.7	1	2.5	0.1	(-)1.0	1.1
Russia	4.5	4.3	3.4	1.3	0.6	(-)3.8	1.2
Índia	8.5	7.7	4.0	6.9	7.2	(7.5)*	6.7
China	11.1	9.3	7.8	7.8	7.4	6.8	7.8
África do Sul	3.7	3.5	2.5	2.2	1.5	2.0	2.3
Estados Unidos	1.5	1.8	2.2	2.2	2.4	3.1	2.3
Alemanha	1.2	3.1	0.9	0.2	1.6	1.6	1.5
França	1.1	1.7	0.0	0.3	0.4	1.2	0.7
Itália	(-) 0.2	0.4	(-)2.4	(-)1.7	(-)0.4	0.5	(-)0.7
Argentina	7.5	8.6	0.9	2.9	0.5	(-)0.3	2.5
Venezuela	6.7	4.2	5.6	1.3	(-)4.0	(-)7.0	0.0
Chile	4.0	5.8	5.4	4.1	1.8	2.7	4.0
Japão	0.8	(-)0.6	2.0	1.6	(-)0.1	1.0	0.8

Sources: ONU, 2013; Fundo Monetário Internacional, 2015.

Obs.: Data from 2015 are IMF forecasts. The data from 2011 regarding Brazil predates the methodological IBGE review, announced in March 2015. The data of India for 2015 is na extra forecast of IMF.

José Roque Junges

Health, environment and chronic diseases: bioethical aspects

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Health, environment and chronic diseases: bioethical aspects

José Roque Junges

Introduction

The sanitary reality of Brazil is always more determined by demographic and epidemiological transition as factors that currently configure the health conditions of the population, for centuries aggravated by social exclusion. The combination of chronic diseases with poverty creates a context of extreme vulnerability that requires, in addition to adequate clinical care of the individual, intersectoral policies of collective nature in that individual sociability environment.

The health system is not prepared to handle the larger number of people with chronic diseases, because it is organized to face acute events. The current clinic to treat acute aggravations is not adequate to support people with chronic conditions, dependent on the longitudinal course of life affected by chronic disease and the context in which that life unfolds. Therefore, it is necessary to consider another clinical paradigm to have resoluteness in the care of people with chronic conditions (Mendes, 2012).

This new clinic will depend on a more refined and complex understanding of health itself. What does having health mean in a situation of chronic conditions? First, health cannot be thought of as the opposite of illness. Following the tradition of Canguilhem (2009) and Illich (1981), it can be said that the possibility and the very fact of getting sick is part of being healthy. Therefore, it is necessary to define health as the ability to cope with illness and react to it. This ability belongs to the person affected

by the disease, but the activation of this capacity depends largely on the environmental conditions of his sociocultural context. These conditions identified with different natural, symbolic, psychological, economic and social resources of the sociability environment of who is chronically ill, allowing him to live life with quality, dealing with the chronicity determinations of his conditions. Thus, health in a chronic situation demands to be considered and managed in relation to the subjectivity of the person affected with chronic illness and her environment for integration and social coexistence.

This interface between health and environment offers new ethical challenges for the professional in this sector. These challenges are guided by two principles: first, you do not take care of someone individually without due attention to the collective conditions surrounding that individual; second, effective care cannot be dissociated of care and management, because this creates the conditions for that to act effectively. Responding to the challenges depend on the consideration of these two principles.

Amplified view of health and clinic

The sanitarian context of the gradual increase of chronic diseases in the Brazilian population imposes rethinking entirely the way to treat and clinically monitor this cases and the way of conceiving what health is. Chronic conditions, on the one hand, are a theoretical challenge to achieve a better definition of health and, on the other, a practical challenge to build a new clinical model for these cases, no longer based on episodic care for acute events but on longitudinal follow-ups, where chronic illness is a biographical element of the individual existential itinerary.

If, in chronic conditions, the disease becomes part of one's existence, so the quality of life and health need to include this element in their understanding, because it is part of the biography. Chronic disease means a disturbing element in the way of living life, with which it is necessary to learn to cope. It is not about adapting to this element, but finding ways to react to the disruptive consequences. It is about losses that need to be compensated for not only being able to deal with them as well as to live

life with the highest possible quality and health in that situation. In this sense, health is the ability to react and handle disturbing factors that disrupt life, finding ways and devices that enable quality and meaning of life amid losses and weaknesses.

Two categories, one taken from biology, autopoiesis, and another from psychology, resilience, can help understand this capability.

The biologists Maturana and Varela (1997) revolutionized the understanding of living beings when they proposed the definition of their identity not from morphological characteristics, but from their autopoietic organization. Any living system is configured as autopoiesis, because it is able to rearrange its components in a new organization, when disturbed. In this sense, autopoiesis is the ability of every living being to react. Therefore, life fundamentally identifies itself with autonomy. What characterizes a living being are not its components or the sum of them, but the very way to organize them due to its autopoietic capacity. The living thing dies when he loses this ability, because he cannot cope with the disorder resulting from the environment to which is attached.

The human being has a more complex autopoietic organization because it is a biocultural being provided, at the same time, of language, and consciousness. Thus, human autopoiesis means a complexification of the ability to reorder its components in a new organization. Health means autopoiesis; disease, an attack on autopoietic organization; and death, the total loss of this capacity. Therefore, health cannot be defined or characterized simply by the presence of certain components, but by the ability to reorder these components into a new existential organization. In humans, the autopoietic organization has a complexity that encompasses the somatic, psychic, social and spiritual dimensions. However, as happens with all living beings whose autopoietic capacity is closely connected and dependent on the ecosystem in which it lives, in humans, similarly, the biocultural autopoietic capacity withdraws from its ecossociocultural context the resources to reorder into a new existential synthesis, when the natural path is disturbed.

In psychology, resilience means to recover, to go forward after the occurrence of a fact that disturbs life. It means first to resist the negative consequences of this fact, trying to overcome its effects, to go on living

the best way possible. It implies that the person traumatized overlaps the disturbing fact and reconstitute.

Resilience is the ability to develop well to continue projecting into the future despite destabilizing events, difficult living conditions and sometimes-severe trauma. It is the universal human capacity to deal with, overcome, learn or even be transformed with the inevitable adversity of life. This protection capability allows one to deal with the harmful effects of an adversity and overcome them. This involves trying to turn bad situations, traumatic moments and difficult and inevitable life situations in new perspectives to go on living with meaning (Manciaux, 2003).

Resilience is a subjective capacity. However, it does not mean in any way an innate overcoming ability of a gifted someone that is independent of the environment, but an aptitude possible by family and social environment to handle frustrations, where that individual lived mainly in the early his life and whose capacity remains dependent on his sociability context, from which he drains the symbolic resources to overcome the negative effects of stressful events.

If health in the context of chronic conditions needs to be understood as the autopoietic and resilient ability to handle disturbing factors and reacting to them, the clinic needs to be rethought to allow the emergence of another model of therapeutic care to people afflicted with chronic diseases. This clinic will have to include the dimension of accompanied self-care, for which the chronic patient is fully monitored so he can assume the self-care of his chronic condition.

Two factors underpin this new model: the uniqueness of human illness and the context/environment of sociability of becoming ill. The chronic condition of a diabetic or hypertensive cannot be treated universally, because each case is unique, clinically speaking. That is why it is necessary a special attention to this uniqueness to understand the biographical subjective experience of illness and the way of dealing with the consequences of becoming ill. This is the basis for a pact between the professional and the user of the therapeutic itinerary agreed between the two and in need of periodic reviews and renegotiation. Only with care and strengthening the motivation potential and accountability of the chronic disease patient,

it will be possible to achieve the goal of self-care, which will be continuously monitored by the professional staff of primary care.

However, it is not enough to have singular care of people with chronic conditions without, at the same time, a look and a consideration for the environment/context of his sociability, because that is where the chronically ill find resources and devices, from biopsychic to symbolic-cultural, to deal with the consequences of its chronicity. This environment/context ranges from the family sphere and neighborhood to the socio-environmental space of the neighborhood and the social and political situation of the historical moment. This ambience explains the social and cultural determinants of the illness experience and of the understanding of its limits and requirements.

Thus, for example, diabetics and hypertensive patients are advised to diet and exercise. However, the economic difficulties to buy food and the disregard for its symbolic and social significance, rooted in deep family traditions, frequently make these prescriptive advices fail. Therefore, it is necessary to engage the very familiar surroundings so there is effectiveness. Chronic ill must receive incentives from their family circle and their social support network to assume his self-care. Another example are physical exercises, which require an enabling environment for its realization. Most people with chronic conditions live in neighborhoods without adequate space to walk or structures to work out. In this sense, the incentive for people to articulate through their neighborhood representations to demand the government the construction of these spaces is part of the monitoring of their chronic conditions.

These local contextual determinants fall into a broader context, that is the environment as a place of social and environmental sustainability and social reproduction of life. This environment sets the standard of living, including sanitation, recreational areas, housing in unpolluted areas with respect to air and water and security measures against violence, so that people can enjoy a satisfactory state of health. Without these minimum conditions, it is impossible the monitoring and the resolute self-care of chronic patients that focus effectively on improving their morbidity. Thus, one cannot think health and subsequent care of these people without including, in monitoring, his sociability context and living environment.

Territory, environment and health

Today, basic health care is more organized and related to the adjoined territory of the population attended by a particular health team. In this sense, the territory is one of the axes of primary care, but, for that, it is important to understand what territory means in its relation to health. Territory may have an administrative meaning of spatial organization of accountability. In this understanding, the territory is something external to health and is only for administrative purposes of the system. However, if territory means the symbolic and social appropriation of a geographical area as ambience of sociability for a particular human group, so it is closely associated with the health conditions of that population.

This geographical space thus constituted is the place of construction and operation of community social support networks that inhabit this proper territory. Being part of this space of daily sociability of a group determines the identity of its inhabitants and define the skills to participate in networks and access services offered by this symbolic social space.

If the social determinants shape the health situation of a social group, then health is essentially linked to the social space that sets these determinants and enables the emergence of social support networks and coexistence. Therefore, a full understanding of health will include the spatial conditions for the social reproduction of life or the promotion of quality of life, because the social space provides the support, resources and tools to respond to any disturbance of the vital balance. Thus, health is resilience or responsiveness, depending primarily on collective environment, which constitutes the geographical space.

In this sense, the very services of the health system need to work in coordination with this social space. The effectiveness of access and response to needs will depend on the integration within the daily sociability of users. Only then, it will be possible to detect contexts of vulnerability and collect effective epidemiological data on the health status of that community.

This understanding manifests in the territories of the teams of the Family Health Strategy, defined as a space of everyday sociability of users and not as adjoined territory defined by numerical and administrative

criteria. Attention to the environment is one of the features of the strategy and roles of community workers, but that environment is not simply the natural ecosystem, but the space appropriated to social use by actors and projects that have shaped this territory. This appropriation answered often-antagonistic interests, giving rise to environmental conflicts that have outsourced environmental costs that focus the health of users from that territory. This close interaction between health and geographical space requires an ecosystemic vision of one's health, including in his understanding the concepts of development, sustainability and environmental justice.

The development is not identified simply with economic progress, expressed by the GDP, but it means the improvement of social living conditions of the population, producing collective well-being and enabling higher quality of life. The criteria for assessing this improvement provided by development is sustainability and environmental justice. Sustainability means the reproducibility of natural conditions for the permanence of basic biodiversity to create social conditions for the reproduction of life and health. The negative criteria to assess this sustainability is environmental justice, aiming for equity in the use of natural resources and the destiny of damage and environmental costs of this development. The concept of ecological footprint helped to understand that certain countries and social groups spend a lot more natural resources to produce the goods they consume than others do, who express very low levels of consumption. This lack of fairness in the use of resources is very unfair, making development environmentally and socially unsustainable. The backside of this unequal use of resources are the costs and environmental damages this development, destined and pushed, usually, to socially vulnerable populations and environmentally fragile areas, creating spaces of environmental injustice, which affects the lives and health of those who live in it, because it destroys the environment that reproduces their living conditions.

If the chronically ill need to be promoted and sustained in their autonomy in the care and responsiveness in the face of worsening risks, its environmental and social living and sociability conditions conform the context from which they derive the different resources needed for this reaction and this care. Environmental and socially unhealthy contexts do

not offer the conditions to assume accompanied self-care of one's chronic condition. To take individual decisions in favor of better quality of life depends on the usufruct of collective contexts of quality of life. This means that the monitoring the chronically ill requires a broader look and an intersectoral concern for environments in which they live and coexist.

Planning as an ethical requirement of clinical and sanitarian accountability

The close relationship between health and environment and the consequent ecosystemic understanding of one's health suggests that is not enough to clinically deliberate with the chronically ill about their therapeutic itineraries, but, at the same time, it is necessary to strategically worry about their collective through planning and intersectoral coordination of environmental and social health conditions in their territory of sociability. In this sense, you do not take care of someone individually without worrying about his feeling of belonging and so the clinical accountability for chronically ill also encompasses a sanitarian accountability for his environment of social reproduction of life. If clinical accountability requires skill to decide the best therapeutic way, the consequent sanitarian accountability requires competence to plan intersectorally the environmental and social conditions for the realization of this care itinerary in chronic situations.

The health professional could say that these conditions are not his responsibility, because his ethical concern is with the clinical care of the chronically ill. However, if the care has to be ethically resolute, not depending on pure good intention, but to achieve results in improving chronic situation so there is real accountability, then the professional cannot use excuses and say that these socio-environmental conditions are not part of his concern of professional ethics. Clearly, changing and improving these conditions are not a direct responsibility of primary care professionals, but as attention is inseparable from management, they need to articulate with the community and the city council health monitoring and management and other sectors of the municipal administration to plan strategies

to implement intersectoral action for the improvement of socio-environmental conditions in the territories of its sanitarian responsibility. Therefore, the concern and the articulation of this strategic plan, which focuses on accountability for the ambience territory of the enrolled population, are part of the professional ethical requirements of primary health care (Junges; Barbiani; Zoboli, 2015).

Conclusions

This reflection allows pointing to the thesis that the true complexity is not in the tertiary level of a hospital, as is generally thought, because this level is more characterized by a technological complexity, while the primary level, where takes place the longitudinal follow-up of the chronically ill, responds to the true meaning of a complex biological reality that is defined in its complexity by its interactions with the environment that make it reorganize itself continuously due to its answers regarding changes in its environmental conditions. Thus, the manifestations of chronicity of a patient depend largely on environmental and social living conditions of the patient, which allow him to react or not to risks and assume self-care. Therefore, there is nothing more complex clinically and sanitarily speaking, than accompany longitudinally a chronically ill in health services. This is the great ethical challenge of primary care professionals.

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Invisibility or invisibilization of the chronic effects of pesticides on health? Challenges to science and public policy

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Invisibility or invisibilization of the chronic effects of pesticides on health? Challenges to science and public policy

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"Basta de novos casos de câncer fazendo sofrer e matando a cada dia!
Basta de crianças nascendo sem os membros, ou com problemas no coração e nos rins!
Basta de crianças entrando na puberdade com dois ou quatro anos de idade!"[1]
(Movimento 21 – Manifest of April 21st 2015)

It emerges from territories affected by the expansion of the agricultural frontier in Brazil the perception of increasing cases of cancer and other chronic diseases among those who work and live in these areas and that they are related to the intensive use of pesticides. Similar complaints are made public by social movements such as those that are part of the Permanent Campaign against Pesticides and for Life[2], questioning the development model imposed to the country, its impact on health and the protection of rights by public policies.

Indeed, in the landmarks of the reprimarization of the economy and the intensification of the production of agricultural (and mineral) commodities in the global south, Brazil has been rising sharply the consumption of agrochemicals in the last two decades, reaching in 2008 the first place in the global ranking and has since remained in the lead of this

1 No more new cases of cancer causing suffering and killing every day! No more children born without limbs, or with heart and kidney problems! No more children entering puberty with two or four years old.

2 See www.contraosagrotoxicos.org/.

expanding market, through which circulates around one million liters of pesticides, producing about 11.5 billion dollars in the country per year (Valor Econômico, 2013). Broad and diverse segments of the population, including workers, rural and urban residents and food consumers, are exposed to this risk, although in different contexts. Chronic toxicity of many active ingredients of pesticides, in turn, is well established in the scientific literature, despite the many challenges related to this field. As we will see in this text, toxicological, clinical and epidemiological studies suggest associations between exposure to pesticides and different chronic effects of these biocides, such as endocrine disorders; effects on reproduction; immunological changes, which result in cancers; congenital malformations; neurological, liver, and kidney diseases; etc. Government agencies such as the Environmental Protection Agency, from the United States, and the International Agency for Research on Cancer also recognize these correlations.

However, if a few steps were taken in the health information systems of the country, in order to approach a little more the epidemiological scenario to the acute poisoning caused by pesticides, still is enormous the unawareness about the sickness and death profile related to chronic effects. How many of the 576,000 new cases of cancer estimated by the Brazilian Cancer Institute for the year 2014, for example, are associated with pesticides? To what extent active ingredients that act as endocrine disruptors influence the increasingly numerous cases of precocious puberty? What about birth defects? These questions are not answered satisfactorily, leaving these diseases in a gray zone of invisibility in the scientific and social fields.

In fact, the risk characterization – that has plenty evidences about pesticides – already indicates the probability of damage and it would not be necessary to prove the occurrence of injuries to trigger public policies to promote and protect health. We have, however, a scenario of scientific controversy, permeated by conflicts of interest and strong and powerful economic interests that actively focus on the State and its public policies. In the public sphere, the invisibility of the probable health problems related to pesticides compromises the debate and critical evaluation of the current development model: as to the silence of what is hidden, one dif-

fuses the idea of success of the development model based on the supposed modernization of agriculture, providing feedback and legitimizing the perverse cycle of its expansion.

So in this text, we will talk about some issues that contribute to understand the social construction of invisibility of the chronic effects of the exposure to pesticides: to what extent cancers and endocrine deregulation relate to pesticides, according to scientific evidence? What are the implications of the episteme and the method of modern science in the assessment of risks related to pesticides? Who and how is exposed to pesticides in Brazil? How the political dispute by the State reflects in the performance of public policies related to the problem? What perspectives for tackling the problem can be considered?

Diseases related to pesticides: a little of what we know

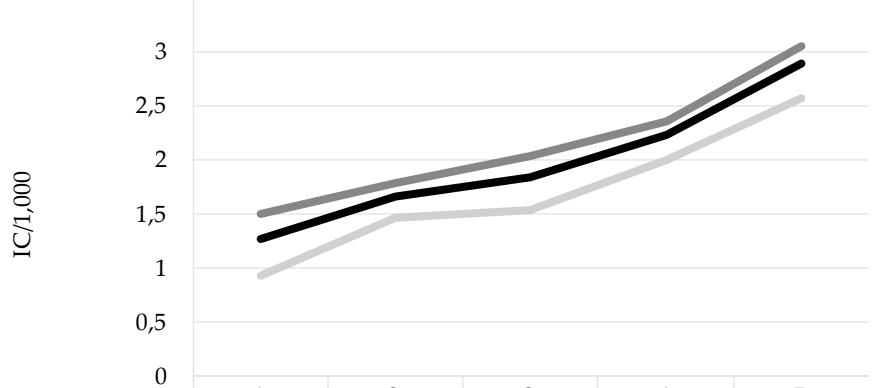
According to the Pan American Health Organization (OPAS, 1996), pesticides, after absorbed by the digestive, respiratory and/or dermal system, can trigger various effects on human health, of acute, subacute or chronic nature:

- Acute – symptoms appear quickly, a few hours after exposure, for a short period, to extreme or highly toxic products. It may be mild, moderate or severe, depending on the amount of absorbed poison. Signs and symptoms vary according to the active ingredient(s) (AI) and are clear and objectives, such as weakness, vomiting, nausea, convulsions, muscle contraction, headache, dyspnea, epistaxis, fainting;
- Subacute – occurs because of moderate or little exposure to high or moderately toxic products and has a slower onset. The symptoms are subjective and vague, such as headache, weakness, malaise, epigastric pain and drowsiness, among others;
- Chronic – is characterized by a delayed onset after months or years, due to small or moderate exposure to one or multiple products, resulting in irreversible damage, such as paralysis, cancer, kidney and liver damage, delayed neurotoxic effects,

chromosomal changes, teratogenesis, endocrine deregulation, etc. In many cases, they may even be confused with other disorders or simply never be related to the causative agent.

Although underdiagnosis and underreporting of acute poisoning are recognized as relevant, between 2007 and 2011, according to data from the Notifiable Diseases Information System (SINAN), there was a rise by 67.4% of new cases of non-fatal occupational accidents due to pesticides, and the coefficient of intoxication increased by 126.8%, higher among women (178%) (UFBA, 2012), as can be seen in Graph 1.

Graph 1. Incidence coefficient of occupational accidents by pesticide poisoning in agricultural workers (IC/1,000) – Brazil, 2007-2011



	1	2	3	4	5
Women	0,92	1,46	1,53	1,99	2,56
Man	1,49	1,78	2,03	2,36	3,05
Total	1,27	1,66	1,84	2,22	2,88

Source: SINAN/MS, 2011; IBGE, 2006; UFBA, 2012.

An example of acute poisoning is the serious accident involving aerial spraying of pesticides, happened in 2013, in Rio Verde (in the state of Goiás), which produced acute intoxication in dozens of children, teach-

ers and school staff and possibly also will cause chronic effects (Búrigo et al., 2015).

When we look back on the cases of diseases related to chronic effects of pesticides, the difficulties of obtaining reliable data are extended. Such effects can affect, for example, the nervous system, causing from neurobehavioral changes to encephalopathy or suicide; the respiratory system, causing asthma to pulmonary fibrosis; or chronic toxic hepatopathy. Further changes are described in human reproduction, as male infertility, miscarriage, birth defects, premature birth and low birth weight in babies, associated with the effects of endocrine and immunogenetic disrupting of some active ingredients (Fernández; Olmos; Olea**,** 2007; Grisolia, 2005; Koifman; Hatagima, 2003; Koifman; Mansour, 2004; Levigard; Rozemberg, 2004; Matos; Santana; Nobre, 2002; Meyer, 2002; Meyer et al., 2003; Peres; Moreira; Dubois, 2003; Queiroz; Waissmann, 2006).

An emblematic case demonstrating the serious repercussions triggered by chronic exposure to pesticides was the death of a agribusiness worker in Ceará, who served for three years in the chemical warehouse of the company, the function of preparing a toxic mixture sprayed on crops and developed a chronic liver disease and died probably induced by toxic substances[3] (Rigotto; Lima, 2008).

From this wide range of chronic diseases involved with exposure to pesticides, this text will focus on two prevalent changes in world population: malignant neoplasms (cancers) and endocrine deregulation.

3 "Reaffirming the ruling of first instance, the Regional Labor Court (TRT) held yesterday a decision condemning the multinational Delmonte Fresh Produce by the death of rural worker Vanderlei Matos, contaminated by chronic exposure to pesticides in the Chapada do Apodi in Limoeiro do Norte. The company, which had filed appeal, will have to pay compensation for moral and material damages, as well as labor amounts to Mary Gerlene Silva Matos, widow of Vanderlei [...]. According to Cláudio Silva Filho, Vanderlei's family lawyer, the judgment of the company in this process is an unprecedented event in Ceará and rare in the country. 'In the face of all the scientific evidence, both from the University as the Public Prosecutor's Office expertise, there is no doubt the death was caused by exposure to the poison. This decision of the TRT is inspiring for the treatment of this issue throughout the country', believes Filho" (JÚNIOR, 2014).

Cancer and pesticides

"O câncer está matando
Muita gente a cada mês
Não tem mais o que fazer
Só Jesus que é rei dos reis
Que os políticos incompetentes
Vê e finge que não vê"[4]
(Fátima, 2014)

Acting on the human organism, pesticides have the potential to trigger direct cellular damage or prevent the suppression system of genetic mutations of organisms to interrupt a chain of altered reactions, which might be the starting point for the development of various types of cancer (Grisolia, 2005).

Curvo et al. (2012) summarize in Table 1 a systematic review of the active ingredients described as carcinogenic in scientific literature.

Table 1. Active ingredients of pesticides described as carcinogenic in scientific literature

Active ingredient	Class	Studies
Glyphosate	H	El-Mofty; Sakr, 1988; Monroy et al., 2005; Cox, 2004; Clapp, 2007
Endosulfan	I	L'vova, 1984; Anvisa, 2009; Nunes; Tajara,1998; Reuber, 1981
2,4-D	H	Matos et al., 2002; Miligi et al., 2006; Sulik et al.,1998; Hayes et al., 1995
Tebuconazole	F	Sergent et al., 2009; Usepa, 2006
Lactofem	H	Buttler ET al.,1988
Haloxyfop-P-methyl	H	IARC, 1972, 1987
Diuron	H	Ferrucio et al.,2010; Nascimento et al., 2009
S-metolachlor	H	WHO, 1996; Leet et al., 1996; Grisolia, 2005
Monosodium methyl arsenate – MSMA	H	Matanosk et al., 1976; Chen et al., 1992; IARC, 1980
Imidacloprid	I	Harris et al., 2010

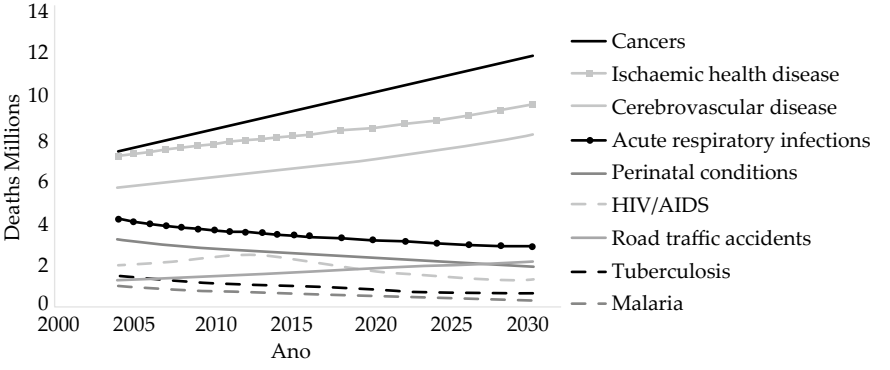
4 Cancer is killing / A lot of people every month / There is nothing left to do / Only Jesus that is the king of Kings / What incompetent politicians / See and pretends not to see.

Thiodicarb	I	USEPA, 2006; Hayes; Laws, 1991
Diafenthiuron	I	Wangenheim; Bolcsfoldi, 1988
Carbofuran	I	Bonner et al., 2005; Hour et al., 1988; Barri et al., 2011
Thiamethoxam	I	Grenn et al., 2005; Pastoor et al., 2005

Note: H – Herbicide; I – Insecticide; F – Fungicide.
Source: Curvo et al., 2012 (adapted).

According to the International Agency for Research on Cancer (IARC), in 2012 were recorded worldwide 14.1 million new cases and 8.2 million deaths by cancer (Ferlay et al., 2013). Projections by the WHO indicate cancer as the cause of death that will increase the most until the year 2030. Graph 2 compares the evolution of the causes of death, according to the year (2004-2030).

Graph 2. Projections of deaths worldwide by selected causes, 2004-2030



Source: WHO, 2004.

With this growth, the WHO estimates that by 2020 cancer will be the leading cause of mortality worldwide, accounting for 16 million new cases, and 70% of deaths caused by cancer will be located in countries from the global south. According to the institution, such an increase is related to factors such as population aging, new diagnostic and tracking techniques, obesity, smoking and alcohol, sedentary lifestyle, environmental, carcinogenic and genetic factors (WHO, 2008). For Brazil, the National Cancer

Institute (Brazil, 2014) estimated 576,000 new cases of cancer for the year 2014. We could ask to what extent pesticides are adequately considered among these "environmental factors", and if was also taken into account all the international context of expanding the production of agricultural commodities, especially in the global south, guided by chemical-dependent model of the "green revolution" and agricultural modernization.

On the weight of the contribution of genetic and environmental factors in the genesis of cancer, an epidemiological cohort study by Lichtenstein et al. (2000) evaluated 44,788 pairs of twins in three countries (Sweden, Denmark and Finland) and concluded that the environment had the lead role as a cause of cancer in relation to hereditary factors, with the exception of prostate, colorectal and breast cancers, for which the inherited contribution was the most significant (42%, 35% and 27%, respectively).

Other epidemiological studies with varied approaches strengthen the relationship between hematological cancers and exposure to pesticides, including, leukemias (Keller-Byrne; Khuder, 1995; Schuz et al., 2000), multiple myeloma (Khuder et al., 1997), Non-Hodgkin lymphomas (Ibid.; Roulland et al., 2009; Schuz et al., 2000) and myelodysplastic syndrome (Nisse et al., 2001). In relation to malignancies of the hematopoietic system, in a case-control study carried out in France between 2000 and 2004, associations were observed between the incidence of Hodgkin lymphomas (HL) and occupational exposure to triazole-based fungicides and herbicides (Orsi et al., 2009).

Another case-control study carried out in four US states, analyzed the occurrence of tumors in farm workers and concluded that after prolonged exposure to organophosphate pesticides, there was a 50% increase in the incidence of NHL (Waddell et al., 2001). The same workers were screened for exposure to carbamates and they concluded that the risk for developing NHL increased from 30 to 50% among exposed workers, particularly those who handled these products for 20 years or more (Zheng et al., 2001).

In a systematic review of the literature (Bassi, 2007) 83 scientific articles investigating the use of pesticides and the occurrence of cancer from 1992 to 2003 were evaluated. The author concluded that several studies showed the association between exposure to pesticides and the incidence

of neoplasms such as leukemia and NHL and, to a lesser extent, the association between pesticides and some solid tumors, such as prostate and brain.

In addition to the extensive scientific literature that supports the relationship between pesticides and cancer of the hematopoietic system, in recent years there is also accumulated evidence about the relationships between these substances and cancer in various locations of the body, such as lung, stomach, melanoma, prostate, brain, testicles and sarcomas (Fontenele et al., 2010; Grisolia, 2005; Keller-Byrne; Khuder, 1997; Romano et al., 2008; Solomon; Schettler, 2000). In Brazil, an ecological study comparing the commercialization of pesticides in 1985 with various health outcomes between 1996 and 1998, in particular, mortality from different types of cancer, concluded that there were significant associations between mortality from breast cancer in women aged 40-69 years and the amount of commercialized pesticides (Koifman; Meyer, 2002).

A cross-sectional study conducted in Ceará, which evaluated the cancer registry between rural and non-rural workers, showed an increase of proportional incidence ratio for penile cancer (6.44/1,000), leukemias (6.35) and cancer of the testicles (5.77), besides other locations, with the risk ranging from 1.88 to 1.12 (urinary bladder, multiple myeloma, lymphoma, connective tissue, eye and its adnexa, esophagus, colon, rectosigmoid junction, kidney, larynx, prostate and thyroid) for these populations (Ellery; Arregi; Rigotto, 2008).

Also in Ceará, a comparative study of cancer mortality indicators in the municipalities of Limoeiro do Norte, Quixeré e Russas – where agribusiness and the use of pesticides is growing – using secondary data from 2000 to 2010, showed an increase by 38% in the rate mortality from cancer in these municipalities, compared to other 12 population group, where there is only traditional family farming of the semi-arid, in which the use of pesticides is small (Rigotto et al., 2013).

Research conducted by Ferreira Filho (2013) found chromosomal abnormalities in bone marrow cells in 25% of the group of workers exposed to pesticides used in banana cultivation in Ceará – aneuploidy; deletions of chromosomes 5, 7 and 11; monosomy; amplification of the

TP53 gene –, abnormalities similar to those found in myelodysplastic syndromes and acute myeloid leukemias that are important for the prognosis of malignant diseases.

Due to the accumulation of evidence, in March 2015, the IARC released an official document in which classified the Glyphosate herbicide and malathion and diazinon insecticides in Group 2A, i.e., as probable carcinogens to humans, and tetrachlorvinphos and parathion insecticides in group 2B, i.e., as potential carcinogens to humans, a statement that has serious concerns for public health in Brazil, because Glyphosate is the most consumed pesticide in the country, accounting for 40% of sales; also malathion and diazinon are authorized and widely used in the country (Carneiro et al., 2012).

In turn, the INCA recognizes the relationship between exposure to pesticides and the emergence of cancer. In a document published in 2012, the institute says:

> Positive associations between hematological cancers and occupational exposures to chemicals were observed in case-control studies in the south of Minas Gerais for workers exposed to pesticides or wood preservatives and to workers exposed to organic solvents, lubricants, fuels and paints (Silva, 2008). Solomon et al. (2000) and Clapp et al. (2007) found a relationship between pesticides and cancer, including hematological, respiratory, gastrointestinal and urinary cancers, among others. Wijngaarden et al. (2003) describe the intrauterine exposure and the occurrence of brain cancer in children. Miligi et al. (2006) have associated the exposure to phenoxyacetic herbicides with increased risk for sarcoma, non-Hodgkin's lymphoma, multiple myeloma and leukemias; exposure to triazines (herbicides) with increased risk for ovarian cancer; exposure to organophosphate insecticides with increased risk for non-Hodgkin's lymphoma, leukemia and prostate cancer; and exposure to organochlorine with increased risk for breast cancer. Still on breast cancer, Snedeker (2001) observed conflicting results between cancer and blood levels or in adipose tissue for DDT pesticide and its metabolite dichlorodiphenyldichloroethylene (DDE). For the Glyphosate herbicide, widely sold in the country, studies have linked the occurrence of non-Hodgkin's lymphoma (Hardell et al, 2002; De Ross et

> al., 2003; Cox, 2004) and multiple myeloma (De Ross et al., 2005). Other studies indicate a positive association between the use of Carbofuran (benzofuranyl methylcarbamate) and the development of lung cancer (Bonner et al., 2005) and the use of the Paraquat herbicide and CNS tumors (Lee et al., 2005). In addition to the pesticides already mentioned, some contaminants in commercial formulations may also have an increased risk of cancer (Brasil, 2012a, p. 37-38).

These evidences led the INCA to launch, on April 8, 2015, public notice in order to "[...] mark the position of the INCA against current pesticide use practices in Brazil and highlight their risks to health, especially to causes of cancer" (Brasil, 2015, p. 2).

Given this scenario that makes explicit the magnitude of cancer as a public health problem increasingly at national and international levels, as commented previously, Brazil faces challenges to understand the implications of this development model on illness and sickness for public policies of care related to chronic diseases.

Endocrine disruption and pesticides

Several environmental pollutants have been studied most recently as potential endocrine disruptors. Of the 11 million substances known in the world, 3,000 of them are produced on a large scale; among them, many are used in domestic, agricultural and industrial environments and have proven hormonal activity (Fontenele et al., 2010).

The International Programme on Chemical Safety (IPCS) defines as endocrine disruptors (EDs) substances or mixtures in the environment that can interfere in the functions of the endocrine system, causing adverse effects in an intact organism or its offspring. Fontenele et al. (2010) cite as examples of endocrine disruptors: insecticides, detergents, repellents, disinfectants, fragrances, solvents, flame-retardants, etc.

The mechanisms and places of action of these EDs in organisms are varied, because they can act both in the binding of endogenous hormone to its receptor as in the steps of synthesis, transport and metabolism of

the natural ligand, besides acting to a lesser extent, as agonists or antagonists (Ibid.). Damstra et al. (2008) point out that the effects of occupational exposure to these interferences can be reversed if workers are removed from that contact in time. However, exposure of certain population groups, during pregnancy or the first years of life, may bring irreversible damage.

Several pesticides can act as EDs and produce important endocrine deregulation. A classic example to demonstrate the performance of a pesticide as endocrine interfering can be the known case of dichlorodiphenyltrichloroethane (DDT), organochlorine compound effective as an insecticide, created in 1939, and increasingly used mostly after World War II, including in public health programs.

About DDT, Fontenele et al. state:

> Gray et al. (1999) demonstrated that DDT has estrogenic action and its metabolite p,p'-DDE, has antiandrogenic action in vitro and in vivo. The first adverse effects of DDT described were observed after major occupational exposures or industrial accidents. Recently, De Jager et al. (2006) conducted a cross-sectional epidemiological study involving 116 young men who lived in endemic areas of malaria in Chiapas (Mexico), where DDT had been sprayed until 2000. The plasma concentrations of p,p'-DDE was used as a exposure parameter to DDT and proved to be a hundred times higher than reported by unexposed people. A semen analysis revealed changes of various parameters that correlated positively with the concentrations of p,p'-DDE, such as a decrease in the percentage of mobile sperm and sperm with morphological defects in the tail, besides genetic defects, indicating adverse effects on testicular function and/or regulation of reproductive hormones. This was the first epidemiological study to show effect after non-occupational exposure to DDT (De Jager et al., 2006) (Fontenele et al., 2010, p. 10).

Although the Stockholm Convention and the Brazilian government have restricted the production and use of DDT against the vectors of diseases, like malaria, it will still cause various health problems to the population in the coming years, due to its long permanence in environments (Associação de Combate aos Poluentes Orgânicos, 2009).

The main systems affected by EDs are reproductive, nervous and immune. Regarding the impact of these substances on animals, Ross et al. (1995) and Sørmo et al. (2009) suggest that exposure to pesticides of Baltic seals has led to the decline of these populations due to interference of these substances on the reproductive and immune systems.

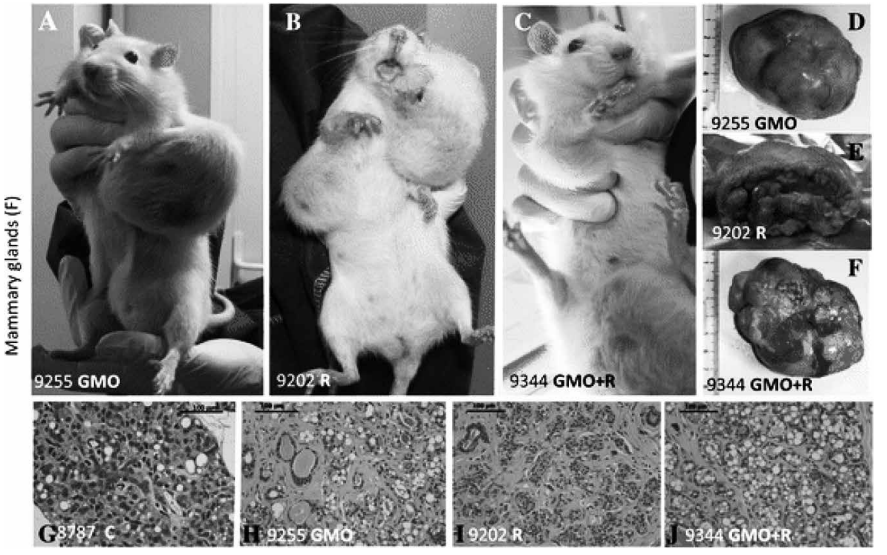
The exposure of alligators to dicofol pesticide, a xenoestrogen, resulted in the development of reproductive abnormalities and increased mortality of these animals (Semenza et al., 1997). Other studies with animals have shown that exposure to pesticides DDT, HCB and nonylphenol cause thyroid abnormalities – decreased T3 and free T4 and increased TSH (Boas; Main; Feldt-Rasmussen, 2009).

Regarding the exposure of humans to EDs, Fontenele et al. (2010) point out:

> In humans, exposure to EDs have been associated with oligospermia, changes in steroidogenesis, cryptorchidism, hypospadias, endometriosis, precocious puberty, abortion, infertility, behavioral disorders and autoimmune diseases (Fernandez et al., 2007; Queiroz; Waissmann, 2006; Strong et al., 2007; Buck Louis et al., 2008; Den Hond Schoeters, 2006). Exposure to xenoestrogens during intrauterine life, childhood or adolescence has been linked to increased cases of breast cancer, early or accelerated puberty (Landrigan; Garg; Droller, 2003) (Fontenele et al., 2010, p. 12).

Study conducted by Séralini's (2012) researcher team analyzed for two years, the exposure of 200 laboratory rats to Monsanto's NK603 transgenic maize and glyphosate, the herbicide used in combination with modified corn. It revealed a higher and more frequent mortality associated with both the consumption of transgenic maize and glyphosate. Hormonal changes found in this study were not linear and sex-related, such as, for example, development in females of numerous and significant mammary tumors, besides pituitary and kidney problems, while males died mostly of severe hepatorenal chronic deficiencies.

Figure 1. Examples of breast tumors observed in females



Obs.: Featured breast tumors: A, D, H – adenocarcinomas from the same animal (mouse) of a group exposed to GMOs; B, C, E, F, I, J – fibroadenomas in two animals exposed to Roundup and Roundup + GMO. All of these groups were compared with the control group. There are not in this figure photos representing the control group, where only a minority had tumors with over 700 days of life, unlike most animals with tumors of the groups exposed to Roundup and/or GMOs. G – histological control.

Source: Séralini et al., 2014; Búrigo et al., 2015.

This study is also important to highlight the relationship between different pesticides that act in endocrine disruption, as those responsible for the etiology of some cancers, such as those that have already been proven by scientific research: breast, prostate, testicular and others (Bradlow et al, 1995; Fucic et al., 2002; Garry, 2004; Mathur et al., 2002; Mills; Yang, 2005).

In Brazil, there are several registered pesticides that are associated with endocrine disruption: 2,4-D, acephate, atrazine, carbendazim, chlorothalonil, chlordane, cypermethrin, cyproconazole, diazinon, dicofol, dimethoate, epoxiconazole, fipronil, hexaconazole, malathion, mancozeb, metribuzin, propanil and tebuconazole (McKinlay et al., 2008).

Friedrich (2013) states that these pesticides are related to effects like

> agonism or antagonism of the functions of estrogen and androgen receptors, dysregulation of the axis of pituitary-hypothalamus hormone, prolactin inhibition or induction, progesterone, insulin, glucocorticoids, thyroid and induction or inhibition of the aromatase enzyme, which is responsible for the conversion of the androgen precursor in estrogens (p. 5).

In addition to the effects on the endocrine system, pesticides have the potential to lead to substantial changes on the immune system, through both mechanisms of stimulation and suppression of this system (Ibid.). With respect to stimulation of pesticides on the immune system, they can induce from hypersensitivity processes to autoimmunity (Burek; Talor, 2009; Duntas, 2011; Fukuyama et al., 2010).

About the role of pesticides as immunosuppressants, it is known that they decrease the resistance of organisms to agents such as viruses, bacteria and fungi, which increases the propensity of individuals exposed to the outbreak of infections caused by these pathogens (Cabello et al., 2001; Hermanowicz; Kossman, 1984). It is also proven that another mechanism responsible for increasing the vulnerability of individuals to infection is by the action of pesticides on the inactivation of vaccines (Barnett et al., 1992; Blakley, 1997; Salazar et al., 2005).

The immunosuppressive effect of pesticides also weakens the organisms in fighting cells that mutate, so many of these substances, which have mutagenic and carcinogenic actions, besides the effect on the immune system, contribute significantly to the etiology of cancer; among them, the methamidophos, methyl parathion and the phorate (Crittenden; Carr; Pruett, 1998; Kannan et al., 2000; Selgrade, 1999).

Pesticides in the Brazilian context

In the international division of labor imposed worldwide by major economic corporations, it is the role of countries from the global south, in this capitalist cycle, the reprimarization of their economies, focusing it on the exploitation of natural resources for export. The subordination to this policy by Brazilian governments has led to reduced exports of manufactured goods (58.4% in 2000 to 37.1% in 2010), when the share of primary goods, such as minerals and food, grew, especially for China (Carneiro et al., 2012).

Regarding agricultural commodities, the "green revolution" and the conservative modernization of agriculture delineate the productive model of agribusiness, focused on achieving increased productivity from the monoculture that is intensive, mechanized and dependent on pesticides and chemical fertilizers. This model, since it affects profoundly the ecological balance, creates the conditions for disproportionate growth of some components of flora and fauna – the "plagues" that would require the intensive use of pesticides.

Indeed, the Brazilian Agricultural Census (IBGE, 2006), according to Bombardi (2011), indicates that 80% of farms with over 100 hectares use pesticides. It also shows that 27% of the smaller properties (up to 10 hectares) and 36% of properties from ten to 100 hectares use these products.

Thus, sales of active ingredients of pesticides grew by 194.09% between 2000 and 2012. Glyphosate still leads sales, with 39.03% of the total traded AIs, followed by 2,4-D, Atrazine, Acephate, Diuron, Carbendazim, Mancozeb, Methomyl, Chlorpyrifos, Imidacloprid and Paraquat dichloride (Brasil, 2013a). Búrigo et al. (2015) report that in 2013 the industry moved US$ 11.454 billion, an increase by 18% over 2012. In addition, they found that, in terms of volume, 823,226 tons of chemicals were sold to Brazilian crops, 12.6% more than in 2011 (Valor Econômico, 2013).

Brazil achieved a consumption correspondent to 5.2 liters of agricultural poison per inhabitant per year (Sindicato Nacional das Indústrias de Defensivos Agrícolas, 2011). Despite that, this average must not hide the uneven distribution of risk among population segments, as evidenced in true sacrifice zones, as Lucas do Rio Verde, Mato Grosso, where this

indicator reaches 136 liters of pesticides per inhabitant/year (Moreira et al., 2010). In addition to consuming huge amount of these substances, the country also widely used pesticides that have been banned in many parts of the world (Carneiro et al., 2012).

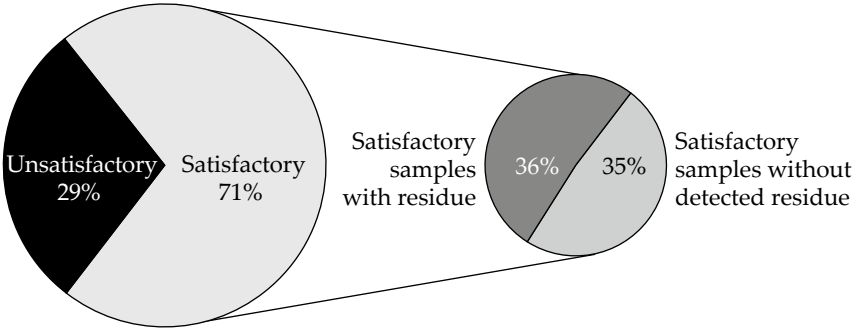
Of all the pesticides sold in Brazil, commodity crops such as soybeans, corn, cotton and sugarcane account for 80% of total industry sales (Sindicato Nacional das Indústrias de Defensivos Agrícolas, 2012). The average consumption of pesticides in relation to the planted area increased from 10.5 liters per hectare (l/ha) in 2002 to 12 l/ha in 2011 (Brasil, 2010; IBGE, 2012). Thus, the increase in consumption is related to several factors such as the expansion of the planting of transgenic soy, which extends the use of glyphosate and other herbicides; increasing resistance of weed, fungi and insects, requiring larger doses or other AIs; and/or the increase of diseases in crops such as soybean rust, which increases the consumption of fungicides. An important stimulus to consumption comes from the absurd tax exemption of pesticides, granted by federal and state governments (Brasil, 2005; Pignati; Machado, 2011; Teixeira, 2011).

Exposure to pesticides can occur at work, either in factories or companies that transport and commercialize it; in agricultural and livestock production – distinguishing here the contexts of differentiated risks for employees of agribusiness, farmers and peasants –; in public health campaigns – including of dengue –; the treatment of wood, the fumigation, in urban weeding; among others. Also occurs environmental exposure to pesticides, especially in the case of people living around those rural or urban enterprises contaminated by air, soil and water.

It should also be noted that the entire Brazilian population is exposed to that risk. According to data from the Program on Pesticide Residue Analysis in Food (PARA), in 2012, only 35% of samples did not show any residues of pesticides, which means that 65% of products contained agricultural poisons (when you add 29% of unsatisfactory results – because they have residues of unauthorized or authorized products, but in concentrations above the MRL – with 36% who had residues, but at concentrations below the MRL (Graphic 3)). It should be noted, however, that are excluded from the list of pesticides analyzed, for example, glyphosate

and paraquat – widely used herbicides, suggesting that these percentages may be significantly underestimated.

Graph 3. Distribution of samples analyzed according to the presence or absence of pesticide residues – PARA, 2012



Source: Anvisa, 2013.

Regarding the presence of pesticides in water for human consumption in Brazil, the Sanitation and Health Atlas by IBGE shows that among the municipalities that declared pollution or contamination, pesticides are among the main three causes, including sanitary sewer and inadequate disposal of garbage (in 72% of causes of pollution in the catchment of surface waters, 54% in deep wells and 60% in shallow wells (IBGE, 2011)

Data from the Ministry of Health analyzed by Neto (2010) report that of the total Water Supply Systems registered in the Information System, designed for monitoring water quality for human consumption in 2008, only 24% had information about the control of water quality for pesticide parameters and only 0.5% have information on the monitoring of water quality for such substances (whose responsibility belongs to the health sector). The author states "[...] It should be noted also that the data refer to the average of 16 Federation Units, since 11 states did not carry out such analyzes and/or did not fed this information system with data from 2008" (Ibid., p. 21).

Research conducted in an irrigated area producer of fruit for export in Ceará revealed the presence of 3 to 12 active ingredients in all 23 samples collected, involving waters from the Jandaíra aquifer and those distributed by the municipal service for household consumption (Marinho, 2010). In Mato Grosso, there was a contamination with residues of various pesticides in 83% of 12 drinking water wells of the examined schools; 56% of rain water samples; and 25% of air samples (patio of the schools), monitored for two years (Moreira et al., 2010).

Regarding this alarming diagnosis, we notice there is an economic and political context that makes the health of the population vulnerable to contamination by pesticides. It should be noted also that the distribution of risks and damage does not occur homogeneously among the different population groups, characterizing the production of inequalities or environmental injustices that penalize especially peoples and traditional communities of the field, employees of large agricultural enterprises, workers and residents in true sacrifice zones where these chemicals are manufactured or consumed, in the countryside and in urban peripheries (Rede Brasileira de Justiça Ambiental, 2001).

Chronic effects of pesticides: scientific knowledge and invisibility

Human societies face complex contemporary social and environmental problems. Among them, the massive diffusion of production and use of chemicals such as pesticides. One must question to what extent the epistemological and methodological frameworks that modern science and its technoscience use are appropriate and sufficient to address these problems, to which genesis they contributed.

Chemical extermination technologies developed in the context of World War II were directly transplanted into agriculture as a strategy to open a new market for the industrial park then installed. The public legitimacy argument, however, was that such chemicals would be added to the mechanization of farming in the design of a new production model of food that would raise productivity and end world hunger. War tanks to

tractors, chemical weapons to "pesticides": on this basis is built the modernization of science-based agriculture (Abreu, 2014).

Rachel Carson starts in 1962 a series of studies that question this model by demonstrating its deleterious effects on human health and ecosystems. The hegemonic science then breaks the complexity of the problem – which involves economic, political, social, ecological and technical relations – and responds with reductionism and simplification. It focuses on defining maximum quantities of pesticides that are supposed to be compatible with health and the environment, and establishes numbers for ADI (acceptable daily intake), MRL (maximum residue limit) and TL (tolerance limit). About this perspective and these "numbers", rules and regulations are constructed to enable the "safe use" of pesticides, supported by monitoring and tracking of contaminated food, use of personal protective equipment by "trained" workers and environmental monitoring.

As Petersen (2015) argues, an epistemological shield is built, which produces public confidence that we are protected that also results in a legal shield for corporations responsible for the spread of agrochemicals, to enable the accountability for injuries and impacts to be transferred to the victims themselves. More than that, this scientific approach apparently neutral and an enunciation of truth, constitutes the basis for the development of public policies that should protect constitutional rights to health, work and balanced environment.

Taking into account critics by Funtowicz and Ravetz (1997) to normal science, we explain next some aspects related to uncertainty and to values and interests at stake, commonly hidden by the hegemonic approach also regarding the evaluation of toxicity of pesticides.

In Brazil, about 434 active ingredients and 2,400 pesticide formulations are registered and authorized in the regulatory system composed of the ministries of Agriculture, Livestock and Food Supply; Health; and Environment (Carneiro et al., 2012). The criteria for these studies involve tests on acute toxicity – by oral, dermal and inhalation routes –; and chronic toxicity, such as effects on reproduction, prenatal development, reverse mutation tests in bacteria and carcinogenicity in rodents (Brasil, 2002).

According to Augusto et al. (2011), the intensive use of pesticides in Brazil imposes the risk of developing diverse and highly deleterious toxic effects, but tests recommended by national and international guidelines have

> limitations for a complete predictive evaluation of the broad spectrum of molecules, receptors, cells and target organs of pesticides with these properties. In addition, the interaction between the nervous, endocrine and immune systems makes it difficult to study the effects that can affect reproduction, metabolic processes, resistance to pathogens and the fight against tumors (p. 264).

The authors also criticize the reductionist application of science by taking as a basis for the toxicological classification of pesticides experimental studies with animals and indicators such as the Lethal Dose 50 (LD50) – statistical estimate of the dose that is not a biological constant but that through a "mathematical abstraction" is extrapolated to humans. Highlighting that these indicators deal with the death effect (mortality) and not of health protection, the authors argue that such an estimate cannot be considered as a security reference, especially for chronic effects.

Friedrich (2013) analyzes the limits of the regulatory systems in the establishment of levels considered safe for the environment and human health (such as ADI, MRL and TL):

- risk assessment based on toxicological studies from laboratory animals or in vitro systems, whose results are extrapolated to the effects on human health;
- separate assessment of a single AI, disregarding the health effects in multiple exposure conditions to different mixtures and their possible interactions, including synergisms, either in the environment or in living tissue. It should be noted that the multiple exposure is the most common situation for the workers, who handle complex toxic mixtures, and for consumers of food, since the presence of several AIs have been identified in a single sample;

- disregard of the effects produced by low doses of pesticides that are not able to trigger the protective mechanisms of detoxification, inactivation or repair, but that can trigger toxic effects of endocrine disruption and on the immune system, mainly in stages considered critical to development;
- disregard of the aggregate risk resulting from total exposure to one or more AIs by different sources, such as the environment, employment and food;
- disregard of the interaction between active ingredients and other chemical substances, such as veterinary medicinal products, fertilizers, heavy metals, genetically modified organisms, etc.

Such limits of the established parameters for exposure to pesticides are not reported to society; on the contrary, the parameters are presented as scientific standards, true, neutral and safe. Also, are not explicated the uncertainties related to the fact that these standards reflect the knowledge available at that time, which could be replaced by more precocious detection techniques of effects or new studies that warn to unconsidered risks. This is the case of glyphosate herbicide, which was registered two decades ago as a class IV – slightly toxic – and recently was recognized as a probable carcinogen by IARC: How much profit did Monsanto have with its sales so far? How many cancer cases could have been caused?

The question is how long it will take to ban glyphosate in the country, since law does not establish periodic reevaluation of registered AIs, unlike the drug registration system. It must be brought up only when there is new scientific evidence or alerts by international organizations. This leads to the situation where, of the 50 active ingredients most used in Brazilian crops, 22 are banned in the EU because of evidence of harm to the environment and human health. Based on this, the Anvisa began in 2004 a revaluation process of 14 AIs, including glyphosate (Carneiro et al., 2012). This process, however, has been affected by conflicts with the chemical industry:

> In a recent publication by Caroline Cox is an important question about whether the registration system of pesticides is sufficient to ensure safe

> use. When recently we experienced the review of the registration process of 14 pesticides by the Brazilian Health Surveillance Agency (Anvisa), we were able to uncover the huge conflict of interest involved in the matter and the difficulties that normative science has to offer to society effective health and environment protection measures (Augusto et al., 2011, p. 267).

Such pressures of the chemical industry and agribusiness allies on the executive, legislative and judicial branches in order to inhibit re-evaluation process of course aim to protect their billionaire market in Brazil, not health and the environment. They also pressure for rapid registration of new AIs, since, to create them, they invest about US$ 256 million to, in about ten years, combine 150,000 components[5]. Therefore, there is urgency to recover this investment and make a profit. In addition, they finance academic studies whose results are compatible with their interests:

> The agrochemical industries invest in co-opting mechanisms of researchers to produce scientific evidence to legitimize the use of its products with financial resources for research. This strategy generates conflicts of interest once it risks the protection of health and social welfare at the expense of financial interests by opening doors to the violation of citizenship rights (Rigotto et al., 2012, p. 246-7).

There are also pressures on independent research. A striking example is the intervention of Monsanto on the editorial board of the journal Food and Chemical Toxicology, after the publication of the article mentioned previously *Long-term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize*, by the French researcher Gilles-Eric Séralini and his team. The study demonstrated the induction of tumors and endocrine problems in rats exposed to Monsanto NK603 transgenic maize and glyphosate. In addition to "unpublish" the article, the magazine welcomed in its editorial board a former employee of Monsanto (who developed the NK603 maize) as editor for biotechnology (Búrigo et al., 2015). The study coordinator manifests:

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5 Information disclosed by economist Horácio Martins (Seminário Agrotóxicos, 2010).

> We are forced to conclude that the decision for the withdrawal of our article was unscientific and that the publisher adopted the standard two weights and two measures. This pattern can only be explained by the pressure of GMOs and pesticide industries to force the acceptance of their products (Séralini, 2014 apud Búrigo et al., 2015, p. 448, emphasis added).

A situation of pressure also affected the embryology lab researcher at the Faculty of Medicine of the University of Buenos Aires Andres Carrasco, who published a study in *Chemical Research in Toxicology* (Carrasco et al., 2010) showing congenital malformations induced by glyphosate in amphibian embryos. The scientist was the victim of threats, disqualification campaigns and suffered political pressures (Búrigo et al., 2015).

Regarding epidemiological studies in populations and regions where there is intensive use of pesticides, important evidence of its impact on human health have been brought to the public, as we saw previously. However, in many cases, remain sharp positivism marks in the epidemiological method, and often the studies are considered inconclusive by peer aligned to domesticated academia and, "in the name of good science," new research are demanded, with larger samples, sophisticated techniques and high cost. As denounces Petersen, "thus the power system that maintains the irrationality of pesticides is institutionally secured, ensuring the continuity of billionaires private businesses at the expense of the public interest" (2015, p. 29).

In turn, the diagnosis of cases of chronic effects of pesticides regarding sick individuals finds limits also in science and medical practice, through which chronic diseases, usually, are considered of multifactorial origin, involving genetic, environmental, nutritional, and immunological factors, among others. To consider its association with an eventual exposure to environmental risks of chemical nature, such as pesticides, would depend on health professionals trained to include in the clinical medical history the investigation of occupational and environmental history of the patient – and with institutional conditions of care that could provide this deepening, retrieving information to characterize possible exposures occurred years or decades ago, given the latency period between exposure and the clinical manifestation of chronic effects.

Therefore, the patient should have this information, which often is not simple, given the bias of memory and limits of access of exposed people to information about the different active ingredients used, doses and exposure conditions. Although this hypothesis is raised by a professional, he would have difficulties to confirm it through, for example, biomarkers, either because they are scarce or too little accessible in public laboratories of toxicological analysis, but mainly because it is not expected that active ingredients, its metabolites or biological effect indicators are still detectable long after the exposure. Even though this process of creating a link between injury and exposure is carried out, it will always be possible, in positivism, to question the role of genetic inheritance or the patient's habits in the genesis of the case, the possible exposure to other cancer, etc., in order to hinder that there is a relationship between pesticides and the emergence of cases of cancer, which strengthens the invisibility of these diseases.

Still we need to mention the problems in relation to health information systems – such as the Notifiable Diseases Information System and the National System of Toxicological Information –, which commonly do not allow nor identifying the occupation of the patient – that could contribute to the establishment of important relationships – nor the exposure to environmental risks. Another difficulty presented by these systems, especially as a database for studies that seek to identify possible concentrations of patients in known contamination areas, concerns the reliability of information on the provenience of the cases, since is frequent the registration of addresses located in urban centers, where there are more technological resources in the health care network – it works as a patient strategy to facilitate access to services.

These are some of the limits of the epistemological and methodological framework of modern science, which simplifies the complexity of the problem and hides uncertainties; as well as of scientific practices, spanned by positivism and conflicts of interest. We must add the business strategies, limited by the values of economic productivism to focus on the scientific field and the social regulation of pesticides, producing invisibility of the victims.

Chronic effects of pesticides: State and invisibility

It is necessary to look briefly into the State's role in the issue of pesticides. In general, governments in the last two decades have been subordinated to the international division of labor imposed by large economic corporations, defining development models that insert the agricultural production system of the country in the global commodities market. The recent appointment of a representative of agribusiness and defender of pesticides as minister of Agriculture, Livestock and Food Supply and the strengthening of Congressional rural caucus are a clear example of this process. Therefore, public development policies are being developed. They lead to agribusiness financing with public funds (BNDES, for example); the promotion of the production of technical and scientific knowledge that serves this model of agricultural production (as at EMBRAPA); the legal and institutional adaptation to the accumulation needs of these agents, as in the case of the Brazilian Forest Code or the authorization of AIs not allowed in the country, in cases of phytosanitary emergency (Law 12873/2013 and Decree 8133/2013), the operation of the National Biosafety Technical Commission or tax exemption for pesticides (Federal Decree nº 6006/1997).

This option has fomented territorial disputes involving indigenous peoples, Afro-descendants and different traditional communities of peasants. It is compromising the country's biodiversity; consuming, exporting and polluting our waters; contaminating, sickening and killing people.

It is in fact a perverse process of violation of rights already assured by the Federal Constitution and a wide infra-constitutional legislation, rights conquered with the struggle of various segments of civil society, such as social movements organized by the men and women directly affected by the current development model in the country, in defense of the guarantee and effectiveness of their rights. Table 2 shows some of these laws.

Table 2. Some existing regulations applicable to the protection of health and the environment in relation to pesticides

Legal document	Subject
Law 8080/1990	The conditions for promotion, protection and recovery of health, organization and functioning of corresponding services
Law 7802/1989 and Federal Decree nº 4074/2002	Research, experimentation, production, packaging and labeling, transportation, storage, commercialization, advertising, use, import, export, waste disposal and packaging, registration, classification, control, inspection and surveillance of pesticides, their components and others
Decree nº 7794/2012	Promotion of the production of organic food and agro-ecological free of contaminants that pose a health risk
Law 11346/2006 and Decree 7272/2010	Create the Food and Nutrition Security System (SISAN) and establish the National Policy on Food and Nutrition Security (PNSAN)
Ordinance nº 01/1986	Assessment of impacts on health and the environment in environmental licensing of projects
Ordinance nº 2866/2011	Establishes the National Comprehensive Health Policy of the Rural and Forest Populations
Ordinance nº 254/2002	Establishes the National Policy for the Health of Indigenous Peoples (PNASPI)
Ordinance nº 2446/2014	Redefine the National Policy of Health Promotion
Ordinance nº 1823/2012	Establishes the National Health Policy of Workers
Ordinance 2914/2011	Establishes the procedures and responsibilities relating to the control and surveillance of water quality for human consumption and its potability standards
Ordinance nº 2728/2009	Establishes the National Network of Integral Attention to Worker's Health (RENAST)
Ordinance nº 2978/2011	Extends the RENAST with the creation ten Reference Centers in Worker's Health (CEREST), geared primarily for the rural population
Ordinance nº 1378/2013	Defines actions of Health Surveillance
Ordinance nº 2938/2012	Sets funding for the implementation of the Health Surveillance among Populations Exposed to Pesticides
Ordinance nº 86/2005	Regulatory Norm for Security and Health at Work in Agriculture, Livestock, Forestry, Forest Exploration and Aquaculture – NR-3

Source: elaborated by the authors (Brasil, 1989, 2002, 2005, 2011, 2012b, 2012c, 2013b).

To illustrate it, the National Comprehensive Health Policy of the Rural and Forest Populations has among its objectives:

> Promote the health of rural and forest populations through actions and initiatives that recognize the specificities of gender, generation, race/color, ethnicity, sexual orientation and religion, in order to access health services, to reduce risks and hazards to health due to work processes and agricultural technologies [emphasis added] and to improve health indicators and quality of life; [...] To reduce accidents and injuries related to work processes in the field and forest, particularly the illness arising from the use of pesticides [emphasis added] and mercury, the one arising from ergonomic risk of working in the field and in the forest and continuous exposure to ultraviolet rays (Brasil, 2011, p. 1-5).

In turn, the goal of the National Health Policy of Workers is

> the development of comprehensive care to workers' health, with emphasis on surveillance, aimed at promoting and protecting the health of workers and the reduction of morbimortality resulting from development models and production processes (Brasil, 2012b, p. 1).

The NR-31 (Brasil, 2005, p, 1) stipulates that employers are responsible, among others:

> a) to ensure proper working, hygiene and comfort conditions, defined in this norm, for all workers, according to the specificities of each activity;
> b) to promote improvements in the environment and working conditions in order to maintain the level of safety and health of workers.

In turn, the Ordinance on Health Surveillance (Brasil, 2013b, p. 1) lists among its actions:

> IV – the surveillance of chronic diseases, accidents and violence;
> V – the surveillance of populations exposed to environmental risks in health.

Of course, for these and other conquered rights to became concrete policies in the territories, it is necessary an articulated operation between not only the various areas of the health sector, as well as between this sector and other areas, according to the National Health Policy of Workers:

> The promotion of health and environments and healthy working processes must be understood as a set of actions, coordinated intra- and intersectoral, which allows intervention in the determinants of the health-disease process of workers, acting in vulnerable situations and violation of rights and ensuring worker's dignity at work [...] The inseparability of production, labor, health and environment shows that the health of workers and of the general population, is closely related to forms of production and consumption and exploitation of natural resources and its impacts on the environment, including work. With that in mind, the precautionary principle should be incorporated as a guide to actions of health and environment promotion and healthy working processes, especially on issues relating to social and environmental sustainability of production processes (Brasil, 2012b, p. 29).

However, these laws do not receive the same support as the State gives to economic agents for their effective implementation as public policy: there is a lack of professionals in public services, infrastructure and training, autonomy, resources, and intersectoral coordination that could bring efficiency to the actions and qualified mechanisms of participation of social groups made vulnerable by this model in decision-making processes.

Final considerations: some lines of flight to break the invisibility of the chronic effects of pesticides and prevent them

We have gathered in this text elements that characterize the intense use of pesticides in the country and the context in which this happens; the amplitude of the population exposed to this risk; toxicological, clinical and

epidemiological evidence on some of the chronic effects caused by them – already recognized even by international agencies –; and the growing perception of those exposed to it on the increased occurrence of chronic diseases related to pesticides.

This situation contrasts sharply with the invisibility of these effects on morbidity and mortality from chronic diseases of the population in the official information systems, in public policies, socially and even in the academic and professional field. Reasons for this have been identified in the very process of knowledge production, skewed by the limits of modern science and the pressure of high economic interests, and in the State, in which such interests articulate and advance, influencing sharply in public policies, legal frameworks and the judiciary.

Therefore, it is not a characteristic invisibility of the problem, but rather a process of social invisibilization, politically constructed and with clear function: deviate from public debate one of the most sensitive and serious impacts of the conservative agricultural modernization, in order to sustain the development model adopted in the country and protect the significant economic interests involved in it.

Thus, the challenge to unveil the chronic effects of pesticides on public health should be recognized in its complexity, and does not take simple or easy solutions: the lines of flight are certainly being built, but in the context of profound asymmetry of power – economic, political, of knowledge and information, etc. – and in a process perhaps too slow when it comes to (the fragility of) life, human and non-human.

Thus, the prospects of coping with this sickening system are certainly mediated by political and deeply related to the expansion of the public debate on the subject, the production and dissemination of critical and contextualized information – which also involves the issue of democratization of the media – among others, to build political force able to redirect the State action.

Important initiative in this direction is the Permanent Campaign against the Pesticides and for Life, launched by Via Campesina on World Health Day in 2011, which already brings together hundreds of organizations, networks and social movements:

> the campaign has become an effective popular mobilization tool where individuals step out of invisibility to turn into collective subjects visualized in the set of actions of the campaign and in other initiatives produced by it, as materials, debates, films, etc. (Carneiro et al., 2015, p. 261).

The Campaign was supported by the Brazilian Association of Collective Health to organize the Dossier Abrasco – a warning about the impacts of pesticides on health[6], bringing together researchers from the collective health field to debate about reflections and scientific evidence to contribute to this matter. There are many challenges facing the scientific field, especially pointing and helping to overcome the limits of modern technoscience, as they reflect directly in the production of necessary knowledge to unveil and prevent the chronic effects of pesticides.

As recognized by the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), it is required "a review of the current model of knowledge, science and technology in agriculture, from the recognition of the complexity and diversity of production systems and agricultural knowledge in different regions of the world" (Búrigo et al., 2015, p. 509).

In this sense, the Report of the United Nations Special Rapporteur on the Right to Food points the potential of Agroecology as "a form of agricultural development that not only has narrow conceptual connections to the human right to food, but also has presented results in the realization of this right next to vulnerable social groups in various countries" (ONU, 2010, p. 1).

An important role in this direction is being developed through the promotion of dialogue between traditional and scientific knowledge, as occurs between the Brazilian Association of Agroecology (ABA) and the

6 Available at: www.abrasco.org.br/dossieagrotoxicos.

numerous and diverse consigned accumulations between farmers, organizations and social movements that constitute the Brazilian Articulation of Agroecology (ANA). Among its most important contributions is the construction and affirmation of alternative ways to produce healthy food, very different from those imposed by the current development model[7].

Such movements have also focused on the democratization of public policy and acted decisively in the construction of the National Policy for Agroecology and Organic Production (Decree nº 7794/2012). Under the National Plan from which it derived is the preparation of the National Program for Pesticide Use Reduction (PRONARA), focusing on six lines of action to be taken by the Government: (1) registration; (2) control, monitoring and accountability of the production chain; (3) economic and financial measures; (4) development of alternatives; (5) information, participation and social control; and (6) education and training.

In this scenario information, mobilization and struggle of broad social segments affected by pesticides and social sectors allied to them will be determinant.

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7 See, for example, the Policy Letter from the III National Meeting of Agroecology, available at www.agroecologia.org.br/index...ao-iii-ena/650-carta-politica-do-iii-ena.

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Chronic diseases, "medicalization" and iatrogenic

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To address the inter-relationship of these health practice issues, particularly the medical practice, it is appropriate to explain, even briefly, some basic concepts related to these aspects.

Chronic diseases

It is assumed that chronic diseases refer to those non-communicable (NCDs) – cardiovascular diseases, diabetes, cancer and chronic obstructive pulmonary disease, among others –, which today constitute the largest demand for health services around the world. According to a recent report released by the Pan American Health Organization, with versions in English, Spanish and Portuguese (OPAS, 2015), only half of patients diagnosed and about half of these are treated; these 25% receiving assistance, only about half reach desired goals of medical treatment. I.e., only one in ten people with chronic diseases is treated successfully (Hart, 1992[1] apud OPAS, 2015). As to the appropriate assistance required, one should take into account that

The integrated management of NCDs is justified for at least three important reasons. Firstly, most people have more than one risk factor and / or NCD (e.g., hypertension and obesity or hypertension and diabetes and / or asthma) [Tinetti; Fried; Boyd, 2012]. Therefore, it is appropriate to

1 Hart, JT. Rule of halves: implications of increasing diagnosis and reducing dropout for future workload and prescribing costs in primary care. **British Journal of General Practice**, v. 42, n. 356, p. 116-119, 1992. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1371996/pdf/brjgenprac00058-0030.pdf.

treat these conditions[2] within an integrated care structure. Another reason why integrated care is justified is that most NCDs impose similar demands on workers and health systems, and similar ways of organizing care and management of these conditions have similar effectiveness, whatever the etiology. Thirdly, most NCDs has primary and secondary risk factors in common. For example, obesity is a major risk factor for diabetes, hypertension, heart disease and some cancers, and heart disease may be a long--term complication of more than one chronic condition, such as diabetes and hypertension (OPAS, 2015, p. 16).

According to Lotufo (2015, p. 51),

> However, in Brazil, we will have to include other leading causes of death in men: cirrhosis and liver disease. [...] It is necessary to understand the dimension of this in mortality in Brazil. They represented, in 2012, 62% of deaths from all causes, but excluding external causes (homicide and car accidents, mostly), the proportion reaches 78% of all deaths.

When presenting the 15 leading causes for men and women, between 30 and 69 years, in 2012, the author comments

> The excess mortality among men is 38% by liver disease (258%), cardiovascular disease (60%) and chronic obstructive pulmonary disease (34%). Deaths due to cancer and diabetes affect both sexes. Preliminary analysis of the 15 leading causes in both men and women indicates underlying determinants, such as atherosclerosis and dyslipidemia (coronary heart disease and cerebral infarction), hypertension (intracerebral hemorrhage and cardiomyopathies), obesity (diabetes) and smoking (upper aerodigestive cancer, lung cancer, chronic obstructive pulmonary disease and coronary heart disease). Another very important factor is high

2 Condition translates better by state, position or situation, but also disease, illness, affection. For example, the heart condition is a cardiac disease; the skin condition is a skin disease according to Santos (1981, 2007). Navarro (2000) also comments: Condition - Avoid uncritical translation for 'condition', because in medical texts it can have two common meanings: 1. Its most common meaning is not a condition, but disease, process, pain, affection, clinical picture or disorder; [...] 2. State, situation (of a patient or a disease).

> prevalence, with high individual consumption of alcoholic beverages: cirrhosis and upper aerodigestive cancers. Add to the impact of the overuse of alcohol other causes of deaths, such as homicides and accidents in general (Ibid, p. 51).

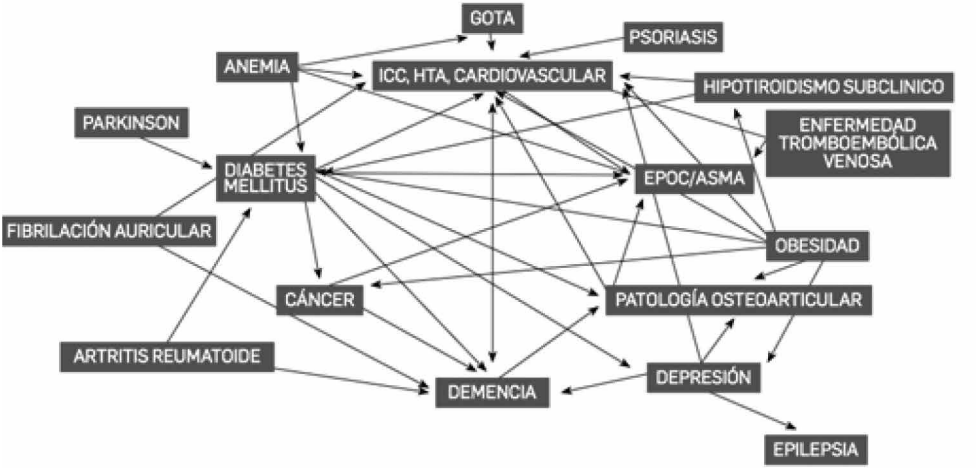
The integrated treatment of chronic degenerative diseases is the greatest challenge of clinical services management, necessarily made interprofessionally, but usually in Brazil prevails the work of the doctor by prescription drug.

PAHO considerations are based on approaches to multimorbidity, as shown in Figure 1 by Martínez Velilla (2013, p. 8).

Figura 1. Multimorbidity definitions

Sometimes the primary disease is linked to relevant comorbidities similar to that considered the main disease, settling to a interinfluente relationship, as shown in Figure 2.

Figure 2. Disease interactions according to recent medical literature (2012)



Notes: EPOC – Chronic obstructive pulmonary disease (COPD); HTA – Arterial hypertension; ICC – Congestive heart failure.

Figure 2 shows that, the older one gets, the more difficult to have a specific condition, since the interaction of diseases which are listed as if they were separate entities in ICD-10 is intense. It is clear, for example, that obesity has relations with subclinical hypothyroidism, osteoarticular disease, depression, congestive heart failure, arterial hypertension, other cardiovascular problems, diabetes mellitus and cancer. These diseases, in turn, also have connections with other diseases, confirming medicine's point of view prior to the current technological stage, that there are no diseases but sick people, and they are not just biological organisms suffering, but social beings who suffer (Bonfim, 2015).

"Medicalization"

The term "medicalization" is a neologism not yet incorporated in Houaiss Dictionary of the Portuguese Language (Houaiss; Villar, 2001) and has several meanings in the specialized literature, depending on the emphasis of sociological, biological or biopsychosocial approach. For a

comprehensive discussion purposes, you can consider the phenomenon according to Orueta Sanchez (2011, p. 151) as "conversion into morbid processes of situations that are and have always been completely normal and that are intended to be solved by the medicine, situations that are not medical but social, professional or of interpersonal relationships".

The authors exemplify (Ibid., p. 52):

- The medical control of certain stages of life (youth, menopause, aging process) is considered necessary;
- Personal / social problems are now understood as medical problems (sadness, grief, post-vacation syndrome, etc.);
- Risk factors are now considered authentic diseases (osteoporosis, hyperlipidemia, etc.);
- Situations or uncommon clinical pictures start to be understood, in an artificial way, as frequent (erectile dysfunction, female sexual dysfunction, etc.);
- Symptoms or mild clinical pictures are seen, in an artificial way, as severe cases (irritable bowel, pre-menstrual syndrome, etc.).

However, one cannot help but reflect on the contribution of Foucault scholars such as Rose[3] (2006, p. 9 apud Maturo, 2012, p. 123), which points out that the molecular manipulation is the main feature of our society:

> The "style of thought" of contemporary biomedicine considers life at the molecular level as a group of intelligible vital mechanisms which can be identified, isolated, manipulated, mobilized and recombined in intervention practices which are not constrained by the apparent normativity of a natural vital order.

So, Maturo (2012) states that we live in a society that becomes increasingly *bionics* (expression used by the author), i.e., biology and

3 Rose, N. **The Politics of Life.** Princeton: Princeton University Press, 2006.

genetics are seen as the main forces that affect human life, with social factors playing a less important role.

He then defines "medicalization" as a process by which some aspects of human life are now considered as medical problems, whereas before they were not considered pathological. The author also believes that Illich (1981), in 1973, made an accurate analysis of the iatrogenesis of many diseases, naming social iatrogenesis the proliferation of diseases caused by the extension of medical categories in everyday life.

Mature (2012) presented a scheme, which can be useful to understand the forces that drive "medicalization". The term "consumerism" refers to consumers who make increasing use of medical terminology in order to analyze their own health because they are influenced by warnings on television and internet searches, and advertisements encourage people to take into account certain needs of health that otherwise they would not consider.

The author also stresses that the use of pharmaceuticals and "medicalization" are not the same. He mentions Abraham (2010, p. 290), which defines "pharmaceuticalization" as "the process by which social, behavioral, or bodily conditions are treated, or deemed to be in need of treatment/intervention, with pharmaceuticals by doctors, patients or both". The main examples include mood treatment with anxiolytics or antidepressants, treatment of attention deficit hyperactivity disorder (ADHD) with methylphenidate (e.g., Ritalin) and treatment of erectile dysfunction with sildenafil (e.g., Viagra). He adds: "even the treatment of heart-disease risk factors with cholesterol-lowering drugs, such as statins, may be considered an example of pharmaceuticalization" (Maturo, 2012, 125 p.). He notes, accurately, "that all the mentioned diseases could be treated by non-pharmaceutical means, as they were in the past: treatments would be medical, like psychotherapy, or non-medical, such as a change in way of life" (Ibid., p. 125).

Another aspect of great importance in Maturo's scheme (2012), which is supported by Abraham (2010), refers to "deregulation" of government agencies, that in the USA requires, for example, that producers demonstrate the quality, security and eficacidade of their products (but not its therapeutic advance) in order to get a new drug approved by regulatory

agencies. He quotes Light (2010, p. 7): "When pharmaceutical companies say a drug is 'effective' or 'more effective', they usually mean more effective than a placebo, not more effective than existing drugs".

The following shows the flowchart of Maturo's article (2012), since it illustrates issues about the concepts of "medicalization", "pharmaceuticalization" and what he calls the bionic society, referred previously.

"Medicalization" machines	
Medical dominance	Biotechnology, "consumerism", care management, pharmaceutical marketing
⇩	
"Pharmaceuticalization"	
Examples: antidepressants, methylphenidate, sildenafil (statins, "stomach protectors" etc.)	Main forces: political economy of pharmaceutical corporations, deregulation of state agencies, "consumerism", DSM (Diagnostic and Statistical Manual of Mental Disorders)
⇩	
Bionic Society	
⇩	
Problems in bionic society	
Prevention as an individual responsibility, placing aside the social determinants of health	Social problems considered as individual problems, reducing the importance of social policy
⇩	
"Pharmaceuticalization"	

Source: Adapted from Maturo (2012).

Iatrogenic

It is not simple to define iatrogenic and iatrogenic disease. According to Pacheco e Silva (1970), quoting Littré[4], *iatron* would be the place where ancient doctors kept their instruments and apparatus, performed

4 Émile Littré (1801-1881) was the French lexicologist who translated the Hippocratic treaties.

operations, treated wounds, fractures or strains and attended patients. One of Hippocrates' books is entitled *On the workshop of a doctor or iatron*; hence came the expression iatrogenic disease to designate a disease caused by the doctor. Pacheco e Silva (1970, p. I) considers a broader meaning:

Iatrogenic diseases should be only those diseases caused by the doctor when, in conversation with the patient, far from clearing it up, calming him down, comforting him, he inadvertently casts doubt on his mind, arousing fears, phobias, obsessive ideas, distress or neurosis. Instead, for others, this same expression would serve to characterize any disease or morbid state, both in physical and psychic sphere, due to the intervention of the doctor and his assistants, whether it is right or wrong, justified or not, but which results in consequences detrimental to the health of the patient.

Lacaz (1970, p. 4) extends the concept when he says that:

> Several factors have interference with the increased incidence of so-called "iatrogenic disease" or "iatropharmacogenetic diseases". Such causes may be remembered as:
> 1 – Rapid development of the pharmaceutical industry;
> 2 – Intensive advertising, supported by high economic power industry;
> 3 – Abusive use of drugs by the people;
> 4 – Large development of surgery, creating new syndromes;
> 5 – Lack of preparation of doctos in medical psychology knowledge.

Still Lacaz (Ibid.), as a pioneer in our surroundings and even internationally, points out, undeniably, the influence of pharmaceutical advertising done by the industry, basic cause of iatropharmacogenetic and, by extension, of iatrogenic – decades later it would be known as adverse effects of drugs, currently an important cause of mortality in countries with a record of adverse reactions. In the USA, for example, adverse reactions already constitute the fourth main cause of mortality.

> Intensive advertising done by the laboratories, especially among young Asclepius, as well as by the press and radio, is another important reason for the casuistry of iatrogenic diseases to be always on the rise. They usually

> announce triumphs and the"miracles", but not the hazards, the harmful or side effects of drugs. The biggest victim of all this is the public. We should keep a good criterion in reading publications from laboratories (Ibid., p. 4-5).

Finally, Lacaz (1970) epitomizes the concept of iatrogenic diseases, with emphasis on the perspective of the medical action, the nature of the drug and its characteristics of dispensing. Moreover, he even foreshadows what would be known later as risk-benefit ratio:

> Iatrogenic diseases (or"man-made pathologic processes","therapy induced diseases","drug induced diseases","disease caused by drugs") depend on the drug and its nature, the patient, the dose and the duration of treatment, the route of use of the product and the speed of the application. We must insist that *all therapy brings a calculated risk* (emphasis added) (Ibid., p. 6).

In the classic work of Avorn and Soumerai (1983) are proposed education strategies to oppose the induction made by the pharmaceutical industry as to the prescription: they recommended the visit of academic "representatives" to improve the quality of decisions on drug therapy and reduce unnecessary expenses. The same author, Avorn (2003), in criticizing those who think that pharmaceutical advertising has beneficial effects for consumers (in the US is allowed to advertise drugs that require prescriptions, unlike Brazil and most countries), suggests that a greater presence of non-commercial communication, oriented to public health, could produce more useful and cost-effective impact on the health of patients.

Wazana (2000) confirmed the influence of the pharmaceutical industry on prescribers, determining their behavior according to her interest, and Angell's (2004) analyzes extended to the entire spectrum of medical activity the understanding that the pharmaceutical industry produces more harm to patients than previously thought.

The great alarm of the need for reorientation regarding the control of the pharmaceutical industry came with the market withdrawal in September 2004 of rofecoxib (Vioxx®, by Merck Sharp & Dohme, in Brazil), an anti-inflammatory non-steroidal. From that moment, it was clear that

something new could emerge in pharmaceutical regulation. That because, according to Drug Watch (2014)

> In 2004, Merck withdrew the drug from the market after a study revealed the drug more than doubled the risk of heart attacks and death. By that point, more than 38,000 deaths were related to Vioxx use, and up to 25 million Americans had taken the drug. [...]Vioxx caused so much damage and destruction that some have called it the worst drug disaster in history. The Vioxx scandal wasn't just devastating to the injured patients and their families; it also underscored problems within the FDA. Many suspect that the New Jersey-based Merck and the FDA worked together to keep the drug on the market and quiet the health concerns [online].

The article by López Rodríguez (2015), *Vioxx: Ambition model*, deserves careful examination:

> September 30, 2004, Rofecoxib is withdrawn from the market. Better known by its trade name: Vioxx. After being used massively worldwide by over 80 million people, its serious side effects forced it. By its quantity and importance **it is the most severe "poisoning" of the history of humanity and the most important recall of a drug worldwide**. Vioxx case is the paradigm of greed. A harm that afflicts our economic system and particularly, in a severe form, our industrial pharmaceutical system. **Our pharmaceutical industry is seriously ill of ambition. Its main objective is no longer improve the health of the population, but the economic benefit**. We will see how **Merck Sharp & Dohme did not hesitate to manipulate scientific research, falsifying data, hiding and hindering accurate information and manipulating medical professionals**. All for the sake of profit [online].

This preamble is preceded by the question: Could there be other cases such as Vioxx or Avandia®[5]?

5 Rosiglitazone, GlaxoSmithKline. Antidiabetic banned in Europe because of cardiovascular risks; in the US sale is restricted, but in Brazil, its registration was canceled on September 29, 2010.

The article analysis what happened before and after the withdrawal of rofecoxib – and ends with the following reflection:

> I want to conclude this on VIOXX with the words of renowned pharmacologist: *Joan-Ramon Laporte*, director of the *Catalan Institute of Pharmacology Foundation*, who explains to *"elmundo.es": 'I do not know of a drug that in such a short time has caused so much pain. Someone asked me if I did not believe that thalidomide had produced more victims, in the early sixties. There were 5,000 cases of birth defects attributed to thalidomide worldwide. Perhaps hormone replacement therapy has led to a number of casualties (fatal and nonfatal) roughly comparable to Vioxx. However, I do not recall that we have never spoken of so many victims of the same drug, in terms of serious and fatal effects. In the case of Vioxx it has become clear that Merck [the manufacturer] knew the cardiovascular risk since 2000, and yet they continued to sell it*. In conclusion, a reflection made in the publication of the Catalan Institute of Pharmacology Foundation, and that we will all share: **'After rofecoxib produced hundreds of deaths and serious events in Spain, there appears to be no one responsible. The Ministry announced it opened a claim, but a few days later said it was purely informative. No one asked MSD at least to return the money to the health system, because the supposed advantages of Vioxx were not correct (Moynihan, 2005). No one claims to the competent authority or the Ministry, which had the obligation to defend the health of citizens. Other pharmaceutical policy, to defend the citizens of the distortions disseminated with commercial purposes, is needed**" (Butlletí Groc, 2005).

Nothing about the subject is known in Brazil.

The bottom line is that many drug regulatory authorities give priority to the process of approval and not to patient safety (Lexchin, 2015). The author exemplified that the FDA wanted to add an alert in the rofecoxib label about the cardiovascular risks after the VIGOR study (Vioxx GI Outcomes Research), but there were objections from the pharmaceutical industry; the outcome of negotiations exceeded one year and finally led to a change: instead of being inserted in the section "alert", it ended in the less prominent section, "precautions", which they said to be of unk-

nown clinical significance. Lexchin (2015) concluded that the first step to decrease the number of people who die as a result of drugs is to understand that questions should be focused and involve the best resources in post-registration surveillance system, giving the safety level of drugs the same importance as to their approval and increasing the transparency of information from both pharmaceutical companies and the pharmaceutical regulatory authorities.

This is in line with the conclusions of Onakpoya, Heneghan and Aronson (2015), who found 95 drugs withdrawn from the market between 1950 and 2013 to cause death. All were taken in at least one country, but at least 16 remained on sale in some countries. Withdrawals were more common in European countries; few were registered in Africa (5.3%). The closer the release date the sooner deaths have been reported. However, in 47% of cases, more than two years elapsed between the first notification of death and the withdrawal of the drug, and this gap has not improved in the last 60 years.

In Brazil, nothing is known about this serious public health problem, not only because the reports of severe adverse reactions are extremely inadequate, but also because reports of death attributable to drugs are rare.

Final considerations

Any educational intervention with prescribers in the Brazilian Public Health System, or elsewhere, requires careful attention to identify the phenomenon of over-diagnosis and subsequent over-treatment, especially pharmacological underlying the interrelationship of chronic diseases,"medicalization"and iatrogenic.

Moreover, it is essential that prescribers, dispensers and everyone that deals indirectly with drugs understand the concept of quaternary prevention.

Excessive diagnosis and treatment

Welch, Schwartz and Woloshin (2011, p. xiv), in a simple, but accurate way, say that overdiagnosis is not only an excessive diagnosis, but also "occurs when people are diagnosed with diseases that never cause symptoms or death."They explain:

> Early diagnosis is the goal. People seek care when they are well. Doctors try to identify disease earlier. More people have early than late disease detection, so there is more diagnosis – including those who have no symptoms. Some of these people are destined to develop symptoms. Others not – they are diagnosed by excess (Ibid., p. xv).

They continue:

> So the problem of excessive diagnosis originates directly from the expansion of the set of persons diagnosed: from individuals with disease (those with symptoms) to individuals with abnormalities (those without symptoms). The problem is aggravated further according to the definition of what constitutes an abnormality that is, increasingly, broad (Ibid., p. xv).

And conclude:

> Since doctors do not know who is diagnosed excessively and who is not, patients with excessive diagnosis tend to be treated. However, a patient diagnosed by excess does not benefit from treatment [...] he can only have damages. It is a simple fact that almost all treatments have the power to cause some damage (Ibid., p. xv).

It is a kind of early diagnosis without the possibility of real development of the disease. If it evolve, it is often bypassed by non-pharmacological interventions (nutrition, adequate physical activity, change in lifestyle, preventive attitudes towards the occupation risks, etc.). Finally, a series of steps which, when taken, prevent pharmacological intervention. If necessary, it certainly will be done with more safety for the patient, in case it really is, for manifesting a disease identified by strict criteria.

Quaternary prevention

Before considering the known definitions of prevention, which is based on the sequence of the supposed natural course of the disease (according to the model of Leavell and Clark expanded), i.e., primordial, primary, secondary, tertiary and quaternary prevention, Segura (2014, p. 181) warns:

> Interventionism is particularly acute in the area of prevention, especially clinic, but also in public health. This has led to a considerable distortion of the concept of prevention [Starfield; Hyde; Gervas, 2008] and the need to approach it from the perspective of prudence, since preventive measures are not exempt of side effects and also because although «they can bring great benefits for the community, they offer little to each individual participant», as Geoffrey Rose explained when describing the so-called "prevention paradox" [Rose, 1981]. Caution and prudence that refer to the more traditional ethical and professional considerations, among which stands out the well-known *Primum non noccere* [Herranz, 2002], inspiration for one of the four basic principles of bioethics, the avoidance of harm, which is not limited to do no harm but also requires learning what is harmful and considering that to try it can expose people, object of our inquiry, to the risk of suffering it [The Belmont Report, 1979].

So it does not incur in the possible intervention problems in the field of prevention, quaternary prevention, formulated to reduce iatrogenic problems, should follow its peculiar object, as suggested by Martínez González et al. (2014, p. 396. e2):

> according to Marc Jamoulle, Belgian doctor creator of the concept, is «to identify patients or groups under the risk of overmedicalization to protect them from invasive medical procedures and offer instead procedures or care ethically acceptable» [Nève; Bernstein; Terra, 2013]. Developing quaternary prevention is a specific and urgent need for the developed societies, in which coexist tremendous paradoxes: an excellent but progressively unsustainable public medicine, with unjustified medicalization; a population increasingly

> dependent on the health system, despite having better health indicators than ever; patients with unlimited health claims promoted by our own medicine, which arrogantly [Sackett, 2002] has generated in the public the idea that everything is preventable and curable; and a medicine that offers preventive programs and evidences of all kinds not always supported by scientific evidence nor valued by health professionals themselves.

The education of the prescribing physician, besides being continued in the matters relating to the risks of a prescription, has to be conservative in the sense indicated by Bonfim (2015, p. 27):

> The conservative prescription was known by other names equally valid as healthy skepticism (on drugs prescription), or cautious prescription, more prudent, rational. This is nothing more than an improvement that doctors and clinical pharmacologists, for decades – without any other intention but the search for rationality in therapeutic act – have recommended, everywhere, to generations of prescribers.

In addition, the ultimate purpose of the therapeutic act is to guarantee the decision making by those who are being taken care of, because (Ibid., p. 61)

> It seems that in our country doctors do not yet fully understand that the administration of health services is an integral part of the complete process of prescription, and often the prescriber does not consider other side, which is the need for a patient to be instructed by the doctor and the health team to acquire the capacity to decide.

Prescribers that are aware, or sometimes by intuition, often follow the suggestions of Gale (2009, p. 1980) to avoid committing the seven deadly sins of drugs prescription, very usual in the treatment of chronic diseases:

> 1. Use of pharmaceutical products to treat a non-pharmaceutical problem;
> 2. Assume that new drugs are better;

3. Repeat prescriptions that do not have rational purpose
4. Use a drug to counteract the adverse events produced by another;
5. Overestimate the benefits of the intervention;
6. Seek the dream of longevity beyond the domains of common sense;
7. Reduce the quality of the life you are trying to improve.

None of us is innocent of these sins, and the safety of drugs should be less of an issue if it was true.

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Smoking: prevalence and regulations

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Smoking: prevalence and regulations

José Agenor Álvares da Silva

> "If tobacco was introduced in society now, certainly it would be considered illegal, because of the accumulated knowledge about the damage caused by its use. Therefore, its legality is the product of a historical mistake" (Brazil, 2002, our translation).

From the glamor of "smoking I wait" to the largest cause of preventable death in the world

Until the middle of last century, smoking was synonymous with glamor, social status, even if it was a prosaic straw cigarette from Minas Gerais' countryside, manufactured with the corn straw, softened by moisture of the tongue in a typically rustic gesture, interwoven through the ring and middle fingers and hold by the pinky and index finger[1]. Made with artisan refinement, using sharp knife and roll-your-own cigarette (preferably the one called capoeirinha), chopped and mixed with mastery in your palm, having a small talk and coffee – filtered through a strainer cloth and made in a wood burning stove – this type of cigarette is known as "pito mouth". The mastery in the making of this cigarette, even today, especially in the countryside, is not to let any of the manipulated ingredients, all at the same time, escape from the hands - often calloused by daily blue-collar work, by those who did and still do this act as daily dilettantism to satisfy the desire for a drag supposedly necessary for relaxing

1 In popular parlance, the fingers are known as pinky, your neighbor, the father of all, cake ruiner and lice killer.

or bringing emotional well-being, thanks to that smoke that encompasses the lungs. What a serene peace.

In a diverse environment of the simplicity of the straw cigarette, the industrialized cigarette, cigar, cigarillo or pipe gave its users the glamor of "smoking I wait", in a reference to words of a tango of the 1950s. These products were refined by industries just to be seen as providers of benefit and personal success to its users. After all, nothing more charming and elegant than to hold between your index and middle fingers, with that triumphant air of Sierra Maestra, a Cohiba from Cuba. Or to enjoy the exciting aroma of refined tobacco imported and placed in a pipe brought from the UK, made from the most legitimate of English rose stem, which gave that intellectual aura, closer to the British nobility than the Geraldinos' environments[2] frequented by sons of this land. That is, a consumer dream finally realized.

> The inspired person who designs the cigarette, makes it a male instrument in the hand of man, a feminine instrument in woman's hand, sophisticated for the sophisticated ones [...] for young people, a touch of rebellion, for the elderly, a tranquility tool, a warm ally in the moments of action and a solitary companion during reflection (Cruz apud Heartier, 1993).

However, time goes by, dreams fade away, science advances and reality finally arrives. What was a guarantee of success for people turned into a disease. Studies by several research institutions, from the 1950s, began to warn of the harm caused by nicotine and the many substances used in the manufacture of tobacco, most carcinogenic. When trying to deceive the user and mitigate the awful taste of pure nicotine, the industry adds adjuvants to facilitate the absorption of that substance and foster the loyalty of the unwary to their brands, especially youth and adolescents.

2 Geraldino is a football metaphor for fans attending regular seats at soccer stadiums. These places were not comfortable, without any protective equipment against bad weather and where the games were seen standing. The discomfort posture was offset by the joy of being close to watch their beloved team, not to mention ticket prices, affordable to low-income workers. Happy times that came to an end with FIFA following the demand of modern multipurpose arenas to house the elite of football.

The subservience to the elegant "habit" is soon felt. It is the beginning of chemical addiction and not healthy habit, as does the aggressive industry--marketing machine makes it sound. It is not something that is under user control, easily discarded in a magic trick.

Researchers and scholars on the scientific evidence and consequences of smoking on the human body consider important to differentiate the conceptual understanding of habit, addiction and dependence. For the industry, I repeat, it is all a prosaic and wholesome recreational habit.

"A habit means [...] a permanent or frequent, regular or expected form of acting, feeling, behaving; mania" (Houaiss; Villar; Franco, 2013). I.e., a matter of mania, which, because it is a mania, will be easy to face and overcome. It is the feeling of absolute control over the situation. Silly mistake. Regarding smoking, this logic does not apply so easily. The famous images of the Marlboro man, riding a pompous stallion in the American West, then on his deathbed, affected by lung cancer, speak for themselves.

Addiction, according to the Aurélio dictionary (2004, p. 2058), means "severe defect that makes a person or thing improper for certain purposes or functions". Today, the smoker who does not respect the rights of non--smokers, especially in collective environments, inappropriate to the use of tobacco products, is considered, from the behavioral point of view, as an antisocial person. The question is how this individual posture should be portrayed, since smoking is characterized as addiction.

Finally, addiction is characterized "by the use and the need, both physical and psychological, of a psychoactive substance, despite the knowledge of its detrimental health effects". "Substances or psychoactive drugs are those that change the user state of consciousness" (AMB, 2013). Nicotine is considered a psychoactive substance.

Therefore, smoking is an addiction characterized by physical and psychological dependence on nicotine consumption. It is included in the group of mental and behavioral disorders resulting from psychoactive substance use, according to the Tenth Revision of the International Classification of Diseases (ICD-10). Tobacco dependence is:

> A cluster of physiological, behavioral, and cognitive phenomena that develop after repeated use and has features such as the strong desire

> to smoke, difficulty in controlling use, persisting in use despite harmful consequences, increased tolerance to nicotine and state of abstinence (OMS, 1997, p. 313-14).

Smoking is the leading cause of preventable death worldwide. Six million lives are lost every year because of tobacco-related diseases, according to the World Health Organization (WHO). In Brazil, there are more than 200,000 deaths annually. This number is alarming and clearly indicates that the national authorities in their respective territories should commit to reducing the prevalence of smoking, in addition to associate with other countries to contain the spread of this evil that devastates the world.

Today the mortality caused by tobacco-related diseases exceeds the mortality of AIDS, cocaine, heroin, alcohol, suicides and traffic accidents combined (Shafey et al., 2009). About 90% of smokers become addicted to nicotine between 5 and 19 years of age (Instituto Nacional do Câncer, 2004). On the one hand, this dependence is considered a pediatric disease; on the other, a true pandemic, with a unique feature: the transmission vector of this disease is an industry. Not just any industry, but the powerful tobacco industry, with its economic and coercive tentacles. With a shameless performance on various actors of world society without any political embarrassment, it aims only to ensure the profusion of its business and rejects any protective measure of the population health that can affect its profits.

Fighting tobacco addiction – an international pact

The worsening of the NCDs worldwide led the WHO to propose, for the first time in history, an international pact in the public health sector to combat smoking, known as the Framework Convention on Tobacco Control (FCTC). Approved in 2003 by the 52nd WHO World Health Assembly, after extensive discussion by State Members, it was ratified by Brazil in 2006 - currently, 178 countries have ratified the convention. The objective of the FCTC is "to protect present and future generations from the devastating health, social, environmental and economic consequences of tobacco consumption and exposure" (OMS, 2003, p. 4).

This treaty, binding on all signatories, provides some guidelines, which aim at reducing tobacco consumption, without, however, disregarding the political conditions of each country. These guidelines are organized into three sets of measures (Cavalcante, 2014):

- Measures related to consumption: emphasis on protection against passive smoking, pricing and taxes on tobacco products, as well as guidance to ban advertising, promotion and sponsorship by industries. In Brazil, the Ministry of Finance has set the minimum price of R$ 3.00 (US$ 0.93) per cigarette pack[3];
- Measures related to the demand: control of illicit trade and sales ban to minors under 18 years;
- Transverse measures: calls the participation of civil society in the fight against smoking.

In Brazil, several measures have been taken in compliance with the guidelines of the Framework Convention. Some of these measures, inclusive, are reference for the formulation of policies to combat smoking in other countries. The highlight of these measures, within the framework of post-FCTC regulation, was the restriction of the use of tobacco products.

Tobacco control, despite the legitimacy of the actions developed for the benefit of society as a whole, regardless of social class and gender, has direct repercussions for a segment that is part of the productive tobacco complex and that the State cannot relegate to a secondary plan. The raw material, tobacco leaves, obviously is a part of the nuclear field of the production complex of tobacco products, without which the industry would be feasible. This production is originated mainly in the field of family farming, consisting of small farmers with estates, mostly up to 15 hectares, dependent on this agricultural commodity for survival (Delgado, 2014).

In the beginning of the last century, the boom of the exporting agricultural model encouraged farmers, especially from the South, to focus on the production of tobacco leaves. It was a trendy product. Even the coat of

3 The minimum price is due to the approval of the Law no 12,546, of December 14, 2011, establishing the Special Regime of Reinstatement of Tax Amounts for Exporting Companies (Reintegra). Please note that this law, an authentic legal and tax monster, stipulated the minimum price for the cigarette pack and raising taxes for the industrial segment as compensation for the reduction of the tax for white goods - not to join the government guidelines to combat smoking.

arms of the Republic portrays the importance of this culture, which, along with coffee production, symbolized the power of Brazilian agriculture. In the coat of arms are portrayed as a symbol of nationalism and importance to the economy of the country back then the coffee leaf on one side and the tobacco leaf on the other.

The Framework Convention did not omit the situation of farmers who grow tobacco leaves in producer countries. Besides the restrictive measures on consumption, it dedicates part of its regulation for the appointment of nation states to adopt economic measures to ensure the conversion of production of tobacco leaf for other cultures. In addition, it states that economic performance guarantees are given according to the needs of family farmers and consistent with the gains with the cultivation of this crop.

Smoking prevalence

> "All epidemics have a type of contamination, a vector that causes disease and death. For the tobacco epidemic, the vector is not a virus, a bacteria or other microorganism - it is an industry and its business strategy" (OMS, 2008 p. 21 apud Brazil, 2014).

International research has pointed to a significant decrease in the prevalence of smoking in various parts of the world, including Brazil. Several factors can be considered as causes of this decline. Among them: education campaigns about the risks of smoking, restrictions to smoke in public or private places, regulation of tobacco products, advertising restriction, warning labels about the side effects of these products, legislative actions taken by some states and counties, etc. These factors have contributed to a considerable decline in smoking rates in Brazil over the last 25 years, despite being one of the world's largest tobacco producers.

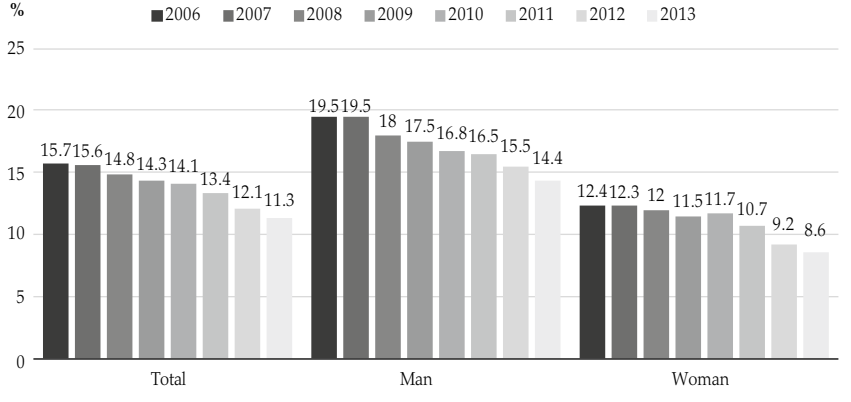
In 1989, smoking prevalence in Brazil was 39.4% among men and 23.9% among women, according to the Brazilian Survey on Nutrition and Health conducted by IBGE. These data are significant and alarming and support the government's decision to intervene in this pathogenic

chain led by tobacco use in order to reduce morbimortality derived from tobacco-related diseases.

From 2002 to 2003, the household survey on risk behaviors and morbidity of diseases to non-communicable diseases, conducted by the Brazilian Cancer Institute (INCA) in 16 Brazilian capitals, confirmed the decline in smoking prevalence. In these capitals, the prevalence ranged from 16.9% to 28.2% among men and from 10% to 22.9% among women. One information about that research has drawn attention: the prevalence of cigarette smoking was higher among men than women considered all social strata. However, in the regions of higher income and higher education, the prevalence between genders was similar (Brazil, 2004).

While there may not be a direct comparison, given the universe in which the two surveys were conducted, a sharp decline in smoking prevalence over the years was proved. In the figure that follows, this downward trend is evident among men and women in the period between 2006 and 2013.

Figure 1. Smoking prevalence by gender in Brazil – VIGITEL 2006-2013



Significant reduction among men and women (2006-2013) p<0.01

Source: Cavalcante, 2014.

According to VIGITEL data for 2011, 11.3% of the Brazilian population uses tobacco products regularly; among the male population, this percentage reached 14.4% (Brazil, 2012).

The decline in smoking prevalence is also confirmed in the 2013 National Health Survey (PNS) by IBGE. With minor differences between the results of the two surveys, the PNS shows the steady decline in smoking prevalence across the country, compared to the beginning of this research. This 2013 survey showed a prevalence of 12.7%; 16.2% among males and 9.7% among females. It also showed the difference in prevalence between urban and rural population. In urban areas, it was 12.5%; in the countryside, 14%.

Tobacco use is responsible in Brazil for about 95% of cases of oral cancer, 90% of breast inflammation, 80% of the incidence of lung cancer, 97% of cases of laryngeal cancer, 50% of skin cancer cases, 45% of deaths from coronary heart disease and 25% of deaths from cerebrovascular disease. There are more than 50 diseases associated with tobacco use (Brazil, 2010).

According to an international survey conducted by several institutions, such as INCA, among 20 countries, Brazilians are the people who most regret having started smoking (91% of respondents). Among Brazilian smokers, 63% support campaigns and laws against smoking and 82% report that smoking has caused them some sort of health problems (NÚMERO..., 2010, online).

World Bank reports indicate that the available evidence shows that poorer individuals tend to smoke more. For them, the money spent on tobacco represents a high opportunity cost: this money is not invested in crucial goods for the family. Tobacco and poverty form a vicious circle, which is difficult to escape from, unless tobacco users are encouraged and receive the support required to quit smoking.

This trend has been observed also in national surveys that correlate higher prevalence of smoking among people with less education, not only in rural areas but also in urban centers. That is, the prevalence of smoking today is more relevant in population extracts more fragile socially and economically, a very vicious circle, as highlighted by the World Bank report.

The Brazilian Plan of Action for Management of Chronic Non-Communicable Diseases, launched by the Ministry of Health in 2010, projects a target of reducing smoking prevalence to 9% for 2022. Considering the speed of the downward trend seen in recent polls, both official or from non-governmental organizations, reaching this goal is quite feasible. This tendency is also due to the engagement of the population in a kind of spontaneous campaign organized worldwide without explicit coordination to combat the harmful effects of smoking.

Given the sharp decline in smoking prevalence, the global tobacco industry seeks aggressive strategies to gain new users. The most prominent is the co-opting of youth, children and adolescents for early initiation, producing advertisements for decades, some subliminal and others not so much, verified in documents of the industries made public.

The age of initiation is an important factor to be considered by government authorities in the formulation of public policies to combat smoking.

> The young are particularly vulnerable to becoming users and once dependent they tend to remain so for many years. And advertising and packaging, which make tobacco use seem less harmful than it really is, when exposed to young people and adolescents, increase the positive perception of tobacco derivatives and the curiosity to consume, which increases the probability of youth and adolescents to start smoking (WHO, 2013).

The co-optation of youth and adolescents is a key strategy for flourishing the businesses of the companies producing tobacco derivatives. The main counterpoint of health authorities around the world is to inhibit the initiation of these products. "Today's teenager is tomorrow's potential regular customer, and the overwhelming majority of smokers first begin to smoke while still in their teens [...] The smoking patterns of teenagers are particularly important to Philip Morris" (Morris, 1981). In other words, the strategy involves replacing consumers that died, often prematurely, due to a number of diseases caused as consequences of smoking addiction.

Parallel to tobacco-related diseases, widely known and disseminated, other illness, not publicized by the media in this world increasingly globalized, is affecting the families of the farmers who grow tobacco leaf: Green Tobacco Sickness, caused by dermal absorption of nicotine due to unhealthy working conditions. Without any personal protective equipment, given the socioeconomic conditions of the families, cropping and transporting tobacco leaf happen in direct contact with the skin of farmers and this favors the absorption of nicotine in infinitely greater amount of nicotine present in the products derived from the leaf.

A 2007 survey of the Ministry of Health, in producing areas of Arapiraca, in the state of Alagoas, and Candelária, in Rio Grande do Sul, denounced the gravity of the situation, notably due to the contamination of children that even during school years are used to harvest because of the high demand for labor for families. Urine tests established the presence of nicotine among the examined groups, even for non-smokers, in higher proportion than found in habitual smokers. The main symptoms of the disease are headache, dizziness, nausea, and cramping, among others. Even not knowing yet the future consequences of this disease, this is another concern of health authorities, not only in Brazil, due to the cruelty of working conditions and the economic exploitation of farmers producing tobacco leaves (Oliveira et al., 2010).

However, as in many similar situations to that of Green Tobacco Sickness, this problem does not affect indiscriminately rich or poor regions. It is a specific problem caused by unhealthy working conditions of the poorest regions, of small farmers forced to use all family members to help. The devastating effects of this disease, as evidenced by the survey of the Ministry of Health, are another harm that directly affect small farmers engaged in the production of tobacco leaf. This disease will be counted as another neglected disease, or more neglected, to be incorporated into the portfolio of developing countries, along with so many others. What about the State? Will it once again demonstrate insensitivity and omission?

Regulation of tobacco products: the happiness quotient

> "Tobacco is a unique consumer product. If it were a new product today, it would not be allowed on the market. Tobacco is toxic, carcinogenic, and addictive. No other consumer product legally available on the market kills when used exactly as the manufacturer intends, and there is no safe level of consumption. For these reasons, tobacco merits legislative and regulatory treatment different from all other products" (Cunningham; Kyle, 1995, p. 85).

Brazil's Federal Constitution consecrate health as a citizenship right of public importance. The state regulation in industrial production in certain areas of strong connection with health issues, especially for those sectors responsible for products that spread risk factors for chronic conditions, is legitimate and highly relevant to the promotion and protection of human health (NETHIS, 2013). In this regard, the Director-General of WHO believes that:

> Efforts to prevent non-communicable diseases go against the business interests of powerful economic operators. [...] All of these industries fear regulation, and protect themselves by using the same tactics. Research has documented these tactics well. They include front groups, lobbies, promises of self-regulation, lawsuits, and industry-funded research that confuses the evidence and keeps the public in doubt. Tactics also include gifts, grants, and contributions to worthy causes that cast these industries as respectable corporate citizens in the eyes of politicians and the public. They include arguments that place the responsibility for harm to health on individuals, and portray government actions as interference in personal liberties and free choice. This is formidable opposition. Market power readily translates into political power (Chan, 2013).

Chan's speech is a warning against attempts to prevent State action to protect human health. Currently, not only in Brazil but also in other countries there is a real crusade against this mission. Some question the legitimacy of the State to interfere, even if only with guidance, on citi-

zens' personal lives to clarify the use of certain products, proven harmful to health. It is the false contradiction between the role of the modern State opposed to individual rights, free will and freedom of expression. The representatives of these industries use all media to proclaim that the citizen does not need clarification regarding his health or warnings about the risks of any product available on the market. They mix up freedom of expression with marketing trickery to mislead the population deliberately (Silva, 2014).

Tobacco control in Brazil dates back to 1986 and great progress has been made since then. Advertising ban and warning labels on packages of tobacco products began to set the tone of the regulatory agenda of a public policy that transcends the transience of extemporaneous governments to turn into a State policy. The result was a decline in smoking prevalence in the country as already highlighted.

Regulation of tobacco products is a big controversy in any part of the world. An emblematic subject, so to speak. Legally commercialized since the early days, these products are the only ones that do not have, anywhere in the world, any reference to its quality or certification of alleged advantages for its use. When the registration of a product is granted by any regulatory State, whether a drug or medical use equipment, for example, one assumes that, if used according to the manufacturer orientation and following current health precepts, the user can achieve some benefit.

In the case of tobacco products, what happens is exactly the opposite. There is no benefit and no orientation from the manufacturer about its use, which induces one to think that the industry itself considers it a lethal product, although legal. That is why Brazil only registers the brand and does not grant the product a full registration. It is the opposite of the regulatory activity of the State. I.e., there is a complete reversal of the regulatory flow – it is an anti-regulation or a reverse regulation, so to speak.

Due to the intrinsic organoleptic characteristics of tobacco products, reverse regulation means guarding the interests of society against the dangers of these products. It can be understood as a set of guidelines issued by the State to regulate a legal product, but admittedly lethal, in order to prevent gimmicks used in industrial production and creative business marketing to trick the user and draw attention to the product.

The regulation of additives used in the production of derivatives of tobacco, undertaken by the Brazilian Health Surveillance Agency in 2010, caused moments of great political tension due to the explicit lobby of the tobacco industry among parliamentarians, the judiciary[4], segments of the executive branch and retail trade. The industry also manipulated small producers co-opted to industry interests with blackmailing them about the possibility of extinguishing their crops. Public consultation on the subject received worldwide the highest number of officially sent answers known in history about this type of consultation, by either email, mail or direct delivery.

There were 127,388 answers to public consultation. After evaluating each response, some unusual facts were found. Of the total, 97,156 letters had the same pattern printed in by a company; there were various irregularities, such as same participant, same handwriting or identical texts. Hundreds were posted in the city of Rio de Janeiro, using the same type of brown envelope, of the same size, same pattern of the stamp indicating the recipient and same post office. This fact drew attention of the Postal Corporation in Rio de Janeiro, who made a telephone consultation to the technical area on the meaning of that flood of correspondence.

The amount of correspondence on this issue also drew attention not only of the Anvisa board, as well as a number of public health protection agencies. Associated with this, in an unusual decision without any legal base that would justify it, a judge from Rio Grande do Sul suspended a scheduled public hearing and, at the height of his arrogance, determined the hearing should take place in a room that could fit at least a thousand people. In the Democratic Rule of Law, each power must be respected and therefore the court order was promptly obeyed. After all, justice is blind.

The hearing was held in a gymnasium in Brasilia, the Nilson Nelson, with a capacity of 15,000 seats, coincidentally, the same place where they held the VIII National Health Conference in 1986. More than 800 people attended the hearing, mostly farmers from the south of the country, brought by tobacco industries. Other groups against and in favor of the

4 Even after the sharp reduction in smoking prevalence, Brazil remains the second largest producer and exporter of tobacco leaf in the world. Around 85% of Brazilian production is exported, according to the Brazilian Association of Tobacco Industry.

measure, such as parliamentarians, medical organizations, health professionals, researchers, universities, ministries, international organizations, the tobacco industry, and consumer organizations and those who protect public health also participated. It lasted four hours. There was an intense debate, in which all without distinction, according to the rules, could present reasons against and in favor of the rule in consultation in an authentic democratic coexistence and respect for conflicting positions. However, most of the arguments defended population health.

However, tensions aside, creativity in regulatory activity may surprise with truly original and unusual arguments, not to say insane. The attempt to bring highly subjective and immeasurable parameters for the objective reality of a regulatory impact analysis draws attention.

In August 2014, the US agency in charge of regulating tobacco products, the F.D.A. (Food and Drug Administration), surprised the United States after introducing in its regulatory impact analysis, in a procedure for granting registration to electronic cigarettes, a totally abstract and surprising concept to offset the economic impact of banning these products in the US market: the happiness quotient. F.D.A. linked this quotient to happiness in order to compensate for the loss of pleasure that smokers had when stopped smoking as opposed to reducing the risk of illness, disability and death. The alleged economic losses from the industrial segment in question must be compensated up to 70% in a cost-effective relation between the product and its consumption restrictions[5].

This proposal became known by the American population through a public hearing made by the FDA and was much debated among economists, including the Nobel Economics Prize Winners, and health professionals across the country. The normative activity of that agency, or, more properly, the privilege of the economic impact on the defense of health, was widely debated, and a warning was explicit: the vulnerability that the use of such a factor could represent in litigations against the tobacco industry. It was so controversial that The New York Times published a story with a warning about the impact that the introduction of this parameter

5 Adapted from comments received via e-mail by Alberto Araujo, coordinator of the Center for the Study and Treatment of Smoking (Federal University of Rio de Janeiro) and member of the Tobacco Commission of the Brazilian Medical Association.

could represent to any measure of protection to public health if taken into account for other products, equally harmful, as alcoholic beverages. Said the newspaper:

> Buried deep in the federal government's voluminous new tobacco regulations is a little-known cost-benefit calculation that public health experts see as potentially poisonous: the happiness quotient. It assumes that the benefits from reducing smoking – fewer early deaths and diseases of the lungs and heart – have to be discounted by 70 percent to offset the loss in pleasure that smokers suffer when they give up their habit. [...] The idea of lost happiness is new for health regulation. But it has surfaced as part of a longstanding requirement – first codified under President Bill Clinton – that every set of federal regulations with more than $100 million effect on economy needs and analysis to prevent the adoption of regulations with high costs and low benefits (Tavernise, 2014, online).

I.e., the guarantees of security of products for domestic consumption associated with quality of life are considered to be of low benefit over the alleged economic losses of companies in the sector. It never fails to amaze the introduction of exotic and subtle criteria to meet the dictates of industrial sectors fallacious of their economic prerogatives. It is the explicit confrontation of exacerbated power to challenge the cost-benefit ratio between the most expensive use of value to people, life, and the commercial value of a proven harmful product searching for space in the consumer market, with the illusion to compensate for alleged losses of citizens' personal welfare. It is an authentic marketing deception of what is considered the greatest villain of humanity. An authentic Nosferatu coming from the ghostly depths of Transylvania.

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Alcohol and noncommunicable diseases: monitoring the Brazilian population according to population surveys

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Alcohol and noncommunicable diseases: monitoring the Brazilian population according to population surveys

Deborah Carvalho Malta

Introduction

The consumption of alcoholic beverages is an accepted and encouraged behavior in most cultures, being associated with festivities, celebrations, religious ceremonies, etc. (WHO, 2002, 2008). Although alcohol use is deeply rooted in the culture of many societies, it is estimated that about 45% of the adult population has never consumed alcoholic beverages. Among women, this percentage rises to 55% (Id., 2011).

According to international data from the Pan American Health Organization (PAHO), there is a high degree of variation in alcohol consumption worldwide. On average, per capita consumption was estimated in six liters per year, where the highest use was in the European region (12.2 liters) and the lowest in the Middle East (0.6 liters). Countries with higher income have higher per capita consumption (around 10 liters) than low- and middle-income countries (around three to four liters). The Brazilian average consumption is about 8.8 liters per capita (Monteiro, 2007).

It is estimated that alcohol-related problems result in an annual cost ranging from 0.5% to 2.7% of Gross Domestic Product (GDP) of different countries (WHO, 2002, 2008, 2011a). Heavy drinking is an important public health problem, influencing morbimortality. The World Health Organization (WHO) estimates that, each year, there are approximately 2.5 million deaths associated with the use of alcohol, accounting for 3.8% of all deaths worldwide, of which 320,000 die young, aged between 15 and 29 years. More than half of these deaths occur from chronic diseases, including cancer, cardiovascular diseases and liver cirrhosis. Among young people, external causes are the most frequent (Id., 2011a).

Their influence on health is also related to different patterns of alcohol consumption. Thus, chronic consumption can cause harm and dependence, resulting in mental, hepatic and cardiovascular diseases, neoplasia, among others. The problems arising from the episodic and acute use are also important risk factors for violence (assaults, homicides, and suicides), transport and labor accidents, etc. (WHO, 2011a; Monteiro, 2007).

The effects of alcohol in the body vary according to the speed and frequency of ingestion, metabolism, genetic vulnerability, sex and lifestyle. Once absorbed, it reaches all parts of the body, leading to decreased reflexes and motor coordination. The initial effect promotes a state of euphoria and disinhibition, but if ingested in larger amounts, the opposite occurs, causing depression of the nervous system, varying in intensity depending on the amount consumed and the individual sensibility (WHO, 2002, 2008, 2011a; Monteiro, 2007; Mascarenhas et al., 2009).

Due to the pleasant effect that occur when ingested in minor doses, drinking stimulates repetition and thereby dependence. Alcohol alters reflections even when small quantities are ingested. The effects vary according to the amount consumed. These effects may alter the ability to drive, for example, becoming a potent risk factor for traffic accidents (WHO, 2008; Monteiro, 2007; Mascarenhas et al., 2009).

There are several revisions and evidence on the relationship between alcohol consumption and cancer risk, documented since the 1990s (Doll et al., 1993; Duffy; Sharples, 1992). Alcohol is a risk factor for the development of some types of cancer, such as tumors in the oral cavity (mouth), pharynx, larynx, esophagus, colorectal, liver, pancreatic and breast. Worldwide, 3.6% of all cancers are attributable to drinking (WHO, 2011a; Doll et al., 1993; Duffy; Sharples, 1992).

The mechanism of action of the alcohol (ethanol) in tissues and the development of cancer are not fully understood (WHO, 2011a; Doll et al., 1993; Duffy; Sharples, 1992). Some evidence suggest that it may act in several ways, promoting changes in the DNA (Deoxyribonucleic Acid) of the cell, resulting in damage to cells and tissues. In the intestine, intestinal bacteria would transform ethanol into acetaldehyde, which is a carcinogenic substance for laboratory animals. Alcohol may also interact with other substances with carcinogenic potential, such as nicotine and other tobacco

substances. Thus, the combined use of tobacco and alcohol enhances oral, throat and esophagus tumors. Alcohol can lead to direct damage to the liver, causing inflammation and cicatrization, changing the liver metabolism and promoting great systemic effects, besides reducing the absorption of nutrients from foods such as folate, which enhances breast and colorectal cancer. Other deleterious effects consist in affecting estrogen and other hormones, increasing estrogen levels, which could rise the risk of breast cancer. Also, there could be an increase on the calories consumed, leading to obesity, which is another risk factor for several neoplasias (WHO, 2011a; Doll et al., 1993; Duffy; Sharples, 1992).

The relationship between alcohol consumption and ischemic heart disease and brain vascular disease is complex, depending on the amount ingested and the pattern of alcohol consumption. There are numerous controversies regarding the possible benefits of alcohol. Some epidemiological data in high-income countries suggest that low alcohol consumption could result in benefits in the evolution of cardiovascular disease in some segments of the population (Corrao et al., 2004; Mukamal et al., 2010; Rehm et al., 2010; Ronksley et al., 2011), but the possible beneficial effects tend to disappear at high consumption patterns (Bagnardi et al., 2008; Roerecke; Rehm, 2010).

Alcohol intake for prolonged periods can increase blood pressure, cardiovascular mortality and mortality in general (Sociedade Brasileira de Cardiologia, 2006). Alcohol is, by definition, the main cause of alcoholic cardiomyopathy, besides being an important causative factor of hypertension and hemorrhagic stroke (English et al., 1995). Moreover, alcohol consumption has harmful effects on blood pressure, heart failure, arrhythmia and hemorrhagic stroke, regardless of the consumption pattern (Rehm et al., 2010).

Low levels of alcohol consumption may have a protective effect against strokes (CVA), especially ischemic, due to its effect on HDL cholesterol, platelet stickiness and other thrombophilia factors (Sociedade Brasileira de Cardiologia, 2006). It also should be pointed out that some studies have led to opposite results on the relationship between alcohol use and stroke. In a comprehensive review, English et al. (1995) found 21 studies, which showed the relationship between alcohol consumption and

increased stroke risk, but eight studies did not indicate any connection. In another large study, Camargo & Rimm (1996) concluded that the evidence of cardiovascular protective effects associated with moderate alcohol consumption is ambiguous. On the contrary, other studies concluded that there is a direct relationship between alcohol consumption and increased risk of stroke (Wannamethee; Shaper, 1996; Yuan; Ross; Gao, 1997).

Therefore, evidences of correlation of the protective effect when alcohol consumption is low are limited and controversial. In addition, alcohol-related harm in the case of cardiovascular diseases (CVD) are widely confirmed (Sociedade Brasileira de Cardiologia, 2006; Xin et al., 2001). As a result, the orientations of the Brazilian Hypertension Guidelines have been, among those who already drink alcohol moderately, to not exceed 30 g of ethanol per day for men and half that amount for women; preferably not regularly. For those who do not have the habit the use of alcohol is not recommended (Sociedade Brasileira de Cardiologia, 2006).

Regarding the effects of alcohol on the brain of children and adolescents, there are countless evidence of harm. Immaturity of the brain confers vulnerability to the young, especially if you have a genetic predisposition (Committee on Substance Abuse, 2010). The use of alcohol and other drugs can affect brain maturation. As a result, adolescents addicted to alcohol and other drugs may have reduced hippocampal volume and an impact on memory and learning skills. Neurophysiological studies have shown that the frontal lobe is essential for functions such as answers to inhibition, emotional regulation, planning and organization, and that the development and maturation of that part of the brain continue during adolescence until adulthood. The lateral lobe is associated with language and hearing and these functions are largely matured in adolescence. In turn, the occipital, parietal and temporal lobes feature small changes in these stages of life and are less affected (Committee on Substance Abuse, 2010). Therefore, the use of alcohol in this phase brings very harmful consequences.

There are countless evidence available regarding the effectiveness and cost-effectiveness of interventions to reduce the harmful use of alcohol (Anderson; Chisholm; Fuhr, 2009; Who, 2009). The most effective measures according to WHO are (WHO, 2008):

i. The increase in excise duties on alcohol consumption;
ii. The regulation of the availability of alcohol beverages, including the definition of minimum age for buying drinks; restrictions on the number of items purchased; blackout periods and sale times. For example, sales ban during the night and, when appropriate, government monopoly on retail sales;
iii. Alcohol exposure restrictions, controlled by regulations or by prohibiting global advertising of alcohol;
iv. Drinking and driving penalties, including intense monitoring, conducting alcohol tests on drivers with low or zero blood alcohol concentration limits, and no tolerance of alcohol consumption, especially for young drivers.

Other measures were tested, but they did not reach a good level of evidence in controlling alcohol. This is the case of educational and isolated measures in the classroom, mass campaigns in the media and warning labels and messages to consumers on products. However, the educational messages and information campaigns can increase the acceptance of these measures among the population when paired with control and restrictive actions (WHO, 2008).

In 2014, in the Global Action Plan for the Prevention and Control of NCDs, the WHO and the Member States adopted the goal of reducing alcohol consumption by 10% among adults and adolescents - or reduce morbimortality caused by alcohol (WHO, 2013). For this purpose, it is necessary to institute measures and public policies that promote advances, and establish monitoring systems of alcohol consumption and morbimortality patterns. Comparative studies on alcohol consumption are a major challenge due to the difficulty of standardized questionnaires, containers with different measurement sizes and alcohol concentration on beverages (WHO, 2002). The Ministry of Health in Brazil in the last decade has performed numerous population surveys aimed at monitoring alcohol consumption among the Brazilian population. For example: a) telephone survey about risk and protective factors for chronic diseases (Vigitel) (Brazil, 2013a) conducted in adults ≥18 years of age; b) National Survey of School Health (PeNSE) (IBGE, 2009), conducted by the Brazilian Institute of Geo-

graphy and Statistics (IBGE) in partnership with the Ministry of Health. They interviewed students from 13 until 15 years old of the 9th year (8th grade) of secondary school; c) Surveillance System for Violence and Accidents (VIVA), held every three years since 2006 in hospital emergencies, interviewing patients suffering from external causes. Includes questions about alcohol use (BRAZIL, 2013b); d) The National Health Research, interviewing approximately 64,000 households across the country about the use of alcohol (IBGE, 2014). These surveys aim to support the design of public policies for health promotion and disease prevention.

The current study aims to analyze these four surveys regarding the use of alcohol and thus provide insights to the design of public policies to control the harmful use of alcohol.

Methodology adopted by the studies

Vigitel data were analyzed (Brazil, 2013a) in adults (≥18 years) living in the capitals of the 26 Brazilian states and the Federal District that have landline, totaling 54,000 interviews each year. Vigitel uses probability sample in two stages: 1) randomly select 5,000 telephone lines in each city, followed by a new draw and the organization of 25 replicates (subsamples) of 200 lines; 2) draw an adult resident (> 18 years) of the household to answer the interview. Post-stratification weights are assigned to equalize the sociodemographic composition of the adult population of the city to the population census, according to sex, age and education. For more methodological details, see specific publications. In this study, the following concept was adopted: abusive alcohol consumption (drinking four or more drinks for women or five or more drinks for men in one occasion within the last 30 days). A dose of alcoholic drink is a shot of liquor, a can of beer or a glass of wine. It is also described the nine-year trend (2007-2013) of this indicator, using linear regression.

PeNSE (IBGE, 2009) was held with school sample of the 9th grade, in two stages. In the first stage, the schools were selected; in the second, classes were selected, interviewing all students in selected classes. The sample was calculated to provide estimates of proportions (or prevalence)

of some characteristics of interest in each of the geographic areas (the 27 state capitals, including the Federal District), with a maximum error of 3%. The data collection instrument was developed from models used in other surveys on behaviors of adolescent students in national and international levels, adapted to the Brazilian reality. The questionnaire was administered to all students in selected classes via a laptop computer operated by the student, known as Personal Digital Assistant (PDA). Then data were analyzed referring to about 109,000 students in 2012. The current study describes the following indicators: a) the testing of one alcoholic drink in life; b) the occurrence of episodes of drunkenness in life; c) the regular consumption of alcohol or during the last 30 days; d) problems with family or friends due to consumption of alcohol (like losing classes, hurting someone or getting into a fight); e) the families' perception if the teenager comes home drunk, taking into account gender and type of school (public or private). It also describes the daily number of doses of alcohol ingested in the last 30 days and the means of obtaining alcohol. It was also presented a study associating the consumption of alcohol and other substances and the behavior of families, such as the supervision of parents and their participation in the lives of children, having their meals together, knowing where the child is in his free time or if he misses classes (Malta et al., 2014a).

The VIVA Survey was conducted in 2011 in public emergency hospitals selected in the state capitals and the Federal District and interviews were collected in 25 capitals, 79 emergency establishments, in different shifts, according to the frequency of attendance of external causes (Malta et al., 2014a). Shifts were drawn in periods of 12 hours, day or night, in the months from September to November 2011. Interviews were conducted by trained technicians using a standardized form, whose variables were distributed according to the following parts: data from the person attended; data of the occurrence (intentionality, type of event, time and place of the occurrence, alcohol use statement); types of accidents and violence; nature of the injury; part of the body affected; and evolution of cases. During the interviews, the interviewer was asked to note if he suspected of alcohol use by the person attended, noting signs like ethyl faces, typical alcohol breath, abnormal gait, loss of balance, among others, and

to ask about the use of alcohol in the six hours prior to the occurrence of the event. The reported events were classified according to the intention into two groups: accidents and violence. Accident was defined as unintentional and avoidable event, causing physical and emotional injuries, in the household or outside, such as work, school, sports and leisure. This group also include transportation accidents, falls, burns, cuts, and falling objects on people. Violence was defined as the use of force against a group or community, which has resulted or has any possibility of resulting in injury, death, psychological harm, developmental disability or deprivation. Under that denomination were included suicide attempts, abuse and assaults (Mascarenhas et al., 2009). In this study, we analyzed the occurrences of accidents and violence according to the report of alcohol consumption by the person who suffered the injury, among victims aged 18 years or older, according to sex, age, education, race/color and type of occurrence.

The National Health Research was a household survey conducted in Brazil in 2013 by the Brazilian Institute of Geography and Statistics, in partnership with the Ministry of Health and the Oswaldo Cruz Foundation (Fiocruz). The initial sample gathered about 81,000 households. Of this total, interviews were conducted in 64,348 households, resulting in a non-response rate of 8.1% (IBGE, 2014). The interviews were conducted between August 2013 and February 2014 with the use of handheld computers - PDAs (Personal Digital Assistance) - programmed to evaluate the received values. Questions on alcohol were included. Here, we will examine the abusive consumption of alcoholic beverages.

In all studies, a statistical analysis was performed using Stata (Statacorp, 2009). The National Commission for Research Ethics of the Ministry of Health of Brazil approved the projects.

Results of the studies analyzed

Vigitel 2013

The following results related to alcohol consumption were found. In the adult population of the 27 cities studied, the frequency of the abuse of alcohol in the last 30 days was 16.4%, almost three times higher in men

(24.2%) than in women (9.7%). In both sexes, the abuse of alcohol was more frequent among younger individuals and tended to increase with the level of education (Table 1). The change in consumption varied from 12% in Curitiba to 22% in Aracaju. (Figure 1). The trend remained stable over the past eight years for men, women and total (Figure 2). Alcohol abuse and drinking and driving reduced significantly between 2007 and 2013 in both sexes and among men (Figure 3).

PeNSE 2012

Of the 109,000 students interviewed, 50.3% experienced one dose of alcoholic beverages or more (95% CI 49.0 - 51.6), while consumption was higher among girls (51.7%) (95% CI 50.8 - 52.6) than among boys (48.7%) (95% CI 46.6 - 50.8) and in public schools (50.9%). The consumption of alcohol in the last 30 days was 26.1% (95% CI 24.5 - 27.7) in Brazil, 25.2% (95% CI 23 - 27.5) for males and 26.9% (95% CI 25.7 - 28.0) for females. Episodes of drunkenness were reported by 21.8% (95% CI 21.1 - 22.5) of students, being more frequent among boys (22.8%) (95% CI 22.0 - 23.7) than girls (20.9%) (95% CI 20.1 - 21.6). These episodes were more frequent in public schools (22.5%) (95% CI 21.7 - 23.2) than in private schools (18.6%) (95% CI 17.8 - 19.3). As for the perception of the students about the family's reaction if they got home drunk, 92.2% (95% CI 92.0 - 92.3) of teens said their parents would care much; 10% (95% CI 8.9 - 11.1) reported having problems with family or friends - for example, missing classes or being involved in fights (Table 3).

Among the students who consumed alcohol in the last 30 days, the most common way to get a drink was at parties (36%), especially for girls; with friends (20.9%); or shopping at the market, at a store, bar or supermarket (16.6%), especially among boys (21.9%). Other 9.1% consumed in the last 30 days alcoholic beverage obtained at home (Figure 4).

Another study by PeNSE investigated the association between the consumption of psychoactive substances (tobacco, alcohol and illicit drugs) and family protective factors (Malta et al., 2014a). Alcohol consumption in the last month encompassed 26.1% of 109,000 adolescents. Some of the factors that prevented the use of psychoactive substances are linked to the protection characteristic of the family context, as living with

parents, having the meal together and parental supervision (parents know what the child does in his spare time). In contrast, skipping school without telling their parents proved to be a risky behavior for the use of tobacco, alcohol and illicit drugs, increasing the risk of the use of tobacco in 1.8 times, 1.98 times for alcohol and 2.7 times for drugs. This points to the importance of family and school in the protection of adolescents and to reduce risk behaviors (MALTA et al., 2014a) (Figure 5).

VIVA Survey 2011

Those who admitted the use of alcohol reached 14.9% in 2011 among the total assistance for people aged ≥18 years, ranging from 11.4% for victims of accidents to 44.1% for victims of violence.

Among the attendance of injuries, the highest proportions were observed in calls for transport accidents (19.6%) and falls (10.2%). Burns and other types of accidents (suffocation, choking, foreign body, drowning, etc.) had ratios of 3.5% and 5%, respectively.

For calls for violence, the occurrence ranged from 33.8% in the case of self-harm to 45.2% for assault/abuse (Table 4).

Taking into account the sex of the victim, the declaration of alcohol intake was two to three times more common among men compared to women attended by accidents and violence (Table 4).

Regarding the age of the victims, the highest proportions of alcohol intake were observed among accident victims aged 18-29 years old (12.7%). The maximum proportion among victims of violence was in the age group from 30 to 59 years (45.7%).

As for the race/skin color, black people (black and mulatto) had the highest proportions of alcohol use for the total attendance (16.9%). In addition, it is worth mentioning the proportion observed among yellow skin people and indigenous (14.9%). It was also noticed a higher frequency of alcohol intake among people with lower levels of education (Table 4).

Conclusions

Consuming excessive amounts of alcohol in a short period is a practice known in international literature as binge drinking or heavy episodic drinking. This practice is more dangerous and often associated with a range of physical, social and mental problems. Vigitel and PNS showed that among adults this consumption pattern stands out among young men from 18-29 years. Similar features were also identified in the VIVA Survey, in which there was a predominance of alcohol consumption among men and young victims of accidents and violence.

Among the many problems resulting from alcohol use, motor vehicle accidents (including cars, motorcycles, and trucks) occupy a prominent place. For every 10 car accidents, 1.5 had reference to alcohol consumption. Drinking and driving increases the risk of traffic accidents (WHO, 2008; Monteiro, 2007; Mascarenhas, 2009). The blood alcohol concentration produces several neuromotor changes in different concentrations. Even low doses (0,3dcg/l or 1 dose) decrease the attention and give a false perception of speed, euphoria and difficulty to discern different luminosities (Monteiro, 2007; National Highway Traffic Safety Administration, 2008).

The pattern of alcohol consumption analyzed here, the binge drinking, is when there is an intake of five or more standard drinks (one alcoholic drink or equivalent contains about 12 grams of pure alcohol, and five doses would add about 60g) for men and four or more doses for women (about 48g). Binge drinking can result in events such as violence, traffic accidents, accidents in general, alcohol intoxication, unsafe sex, unplanned pregnancies, sexually transmitted diseases and HIV (Monteiro, 2007). In most Latin American countries, including Mexico, Brazil, Peru, Bolivia, Uruguay, Costa Rica and Chile, binge drinking is particularly high, especially among young people, as described here.

The VIVA Survey shows that the relationship between alcohol and violence/abuse is even more serious because in about half of cases there was reference to alcohol consumption. Studies indicate a relationship between the restriction of sale of alcoholic beverages and closing bars at certain night shifts with the reduction of homicides (Duailibi, 2007). Such evidence underlied WHO and Member States in the adoption of resolu-

tions on political and legal restriction measures to alcohol consumption and vehicle direction, alcohol advertising control, ban on sales to minors and restriction of outlets of alcohol (WHO, 2008).

Another major point of consideration are the alcohol data among students. About half of the adolescents aged from 13 to 15 years have taken at least one dose of alcohol, a quarter presented episodes of drunkenness and 9% reported having had alcohol problems (Malta et al., 2014b). These data show the extent of the problem of such a sensitive topic with adolescents. The study calls attention to the ease with which young people interviewed had access to alcohol at parties, bars, shops and at their own home (Malta et al., 2014b, 2014c).

Associated with genetic predisposition, the use of alcohol in this phase of life can also affect brain maturation and reduce hippocampal volume - and hence learning and memory (Committee on Substance Abuse, 2010). The use of alcohol in adolescence may result in traffic accidents, homicides, suicides, depressive disorders, anxiety, fights at school, property damage, early sexual initiation and risk attitudes, such as not using condoms, multiple partners and pregnancy (Cooper, 2002; Stueve; O'Donnell, 2005), and lead to excessive use in adulthood (Malta et al, 2011).. Furthermore, alcohol consumption is a risk factor for the use of other drugs, such as tobacco and illegal drugs (Iglesias et al., 2007).

Constant exposure of adolescents to media directed to beverage advertising was associated with alcohol consumption among teenagers (Vendrame et al., 2009). PeNSE studies show that the higher education of the parents, the greater the risk of alcohol consumption in adolescence (Malta et al., 2014b).

Data from PeNSE show the spread of alcohol among adolescents, besides frequent drunkenness, ease of purchase in shops and, worse, access at home, increasing the chances of involvement in episodes of risk (Malta et al., 2014b). Studies show that when parents are more aware of the activities carried out by their children, kids have less involvement with alcohol, drugs and tobacco (Malta et al., 2011, 2014a, 2014c; Paiva; Ronzani, 2009). The attention of parents to the attitudes and behaviors of the children acts as a protective factor for drinking, tobacco and drugs (Malta et al., 2014a, 2014c).

In May 2010, the World Health Assembly adopted the Global Strategy to Reduce Harmful Use of Alcohol (WHO, 2008) and urged Member States to incorporate their decisions. The strategy sets out guiding principles for the development and implementation of alcohol prevention policies at all levels and sets priorities for global action. Moreover, it urges a set of policy choices for the implementation at national level. The strategy recommends 10 points, such as: leadership and commitment to the subject; structuring healthcare advice and treatment; involving the community in identifying needs and solutions; establishing control policies of the alcohol level, surveillance, and policies; reducing the availability of alcohol; regulating the commercialization of alcoholic beverages; establishing pricing policies; reducing the negative consequences of alcohol consumption and its poisoning; reducing the impact of illegal and informal alcohol on public health; establishing monitoring and surveillance of alcohol.

Some of these measures have been implemented in Brazil, highlighting the Action Plan to Combat Chronic Non-communicable Diseases (Brazil, 2011), which presents reduction targets of alcohol consumption and reports the best evidence for reducing alcohol use as recommended by WHO (WHO, 2008, 2011b, 2013; Brazil, 2011). They are: a) strengthen the implementation of pricing policy and raise taxes on products derived from tobacco and alcohol in order to reduce consumption; b) support the intensification of surveillance measures related to the sale of alcoholic beverages to minors (<18 years); c) strengthen educational measures of the School Health Program (PSE) to prevent and reduce tobacco use and alcohol abuse; d) support local initiatives to control the sale of alcohol, establishing sales break time for bars and similar places.

Other important public policy measures consist of banning drinking and driving (Brazil's Dry Law - Brazil, 2008; New Dry Law - Brazil, 2012), which has already resulted in the reduction of alcohol consumption for those who drive (Moura et al,, 2011; Malta et al., 2014d). More recently, other initiatives are the Life in Traffic Project, a partnership involving the Ministry of Health, the National Traffic Department, the Ministry of Justice, PAHO, WHO, Bloomberg Foundation, among others, to reduce traffic accidents, and the Plan for the Decade for Road Safety (Brazil, 2010; Morais, 2013).

Depending on the best available evidence, published by WHO (2008) for the control of alcohol, especially among adolescents, such as actions in public health, society must deepen the debate on the measures to raise taxes of products, restrict access to alcoholic beverages sold, ban on alcohol advertising, promote and sponsor drinks as well as the supervise the measures adopted.

Brazilian law bans advertising only of drinks with an alcohol content above 13 degrees Gay Lussac. Thus, beer advertisements may be transmitted freely, and children and adolescents are continuously exposed to the marketing of these drinks, which can contribute with high prevalence in these age groups (Vendrame et al., 2009). Brazil has experienced important successes in tobacco regulatory policy, which contributed to the reduction of prevalence (Brazil, 2013a), especially among young people (IBGE, 2009). To obtain the same results in the reduction of alcohol use, among young people and vulnerable populations, it is important to move forward in the regulatory debate, especially in beer advertising ban, since the advertising of alcohol among children and youth stimulates consumption (Vendrame et al., 2009).

It becomes important the debate involving government, legislative, health and education professionals, society, families and young people in order to advance on public policy and a regulatory framework for alcoholic beverages.

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Appendix

Table 1. Percentage* of individuals who, over the past 30 days, consumed four or more doses (women) or five or more doses (men) of alcohol in a single occasion in the whole adult population (≥ 18 years) of the Brazilian state capitals and the Federal District, by sex, age and years of schooling

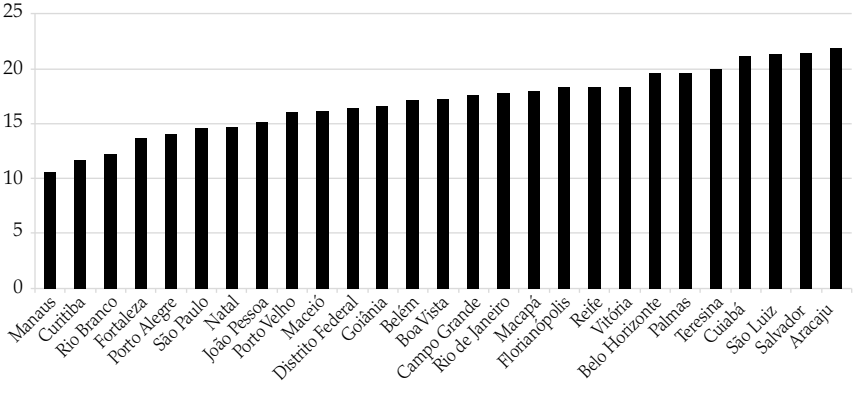
Variables	Total				Sex							
					Male				Female			
	%	95% IC			%	95% IC			%	95% IC		
Age (years)												
18 to 24	19.0	17.1	-	20.8	23.3	20.5	-	26.0	14.3	11.9	-	16.7
25 to 34	22.7	21.0	-	24.3	31.6	28.9	-	34.3	13.8	12.0	-	15.7
35 to 44	17.5	16.0	-	19.0	27.1	24.3	-	29.9	9.8	8.4	-	11.1
45 to 54	15.0	13.6	-	16.4	22.6	20.0	-	25.2	8.9	7.5	-	10.3
55 to 64	10.5	9.3	-	11.7	17.6	15.1	-	20.0	5.5	4.5	-	6.5
65 to mais	4.0	3.1	-	4.8	7.8	5.8	-	9.8	1.5	0.9	-	2.1
Years of schooling												
0 to 8	12.8	11.7	-	14.0	20.2	18.2	-	22.3	6.4	5.3	-	7.4
9 to 11	17.5	16.5	-	18.6	25.4	23.6	-	27.1	10.6	9.4	-	11.7
12 and more	19.7	18.4	-	21.0	28.4	26.1	-	30.6	13.0	11.5	-	14.4
Total	16.4	15.7	-	17.0	24.2	23.0	-	25.4	9.7	9.0	-	10.4

Source: Brasil, 2013a.

Note: * Percentage weighted to adjust the sociodemographic distribution of the Vigitel sample to the distribution of the adult population of each city projected for the year 2013 (see Methodological Aspects).

95% CI: 95% of confidence interval.

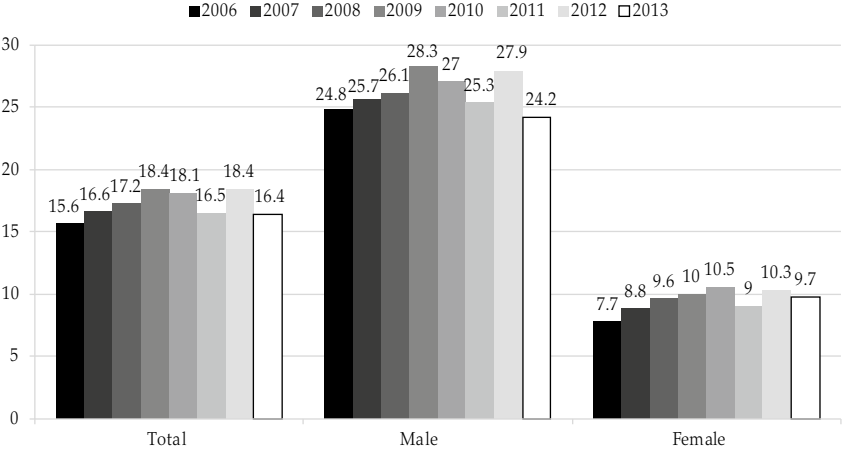
Figure 1. Percentage of adults presenting abusive consumption of alcohol in the last 30 days, according to the Brazilian state capitals and the Federal District



Source: Brasil, 2013a.

Note: 95% CI: 95% of confidence interval.

Figure 2. Evolution of the frequency of adults who reported excessive consumption of alcohol, by sex, Vigitel 2006-2013



Source: Brasil, 2013a, and Malta et al., 2014d. [47]

Observation: $p < 0.05$ – Significant reduction in both sexes and among men (2007-2013).

Figure 3. Evolution of the frequency of adults who reported driving after excessive consumption of alcohol, by sex, Vigitel 2006-2013

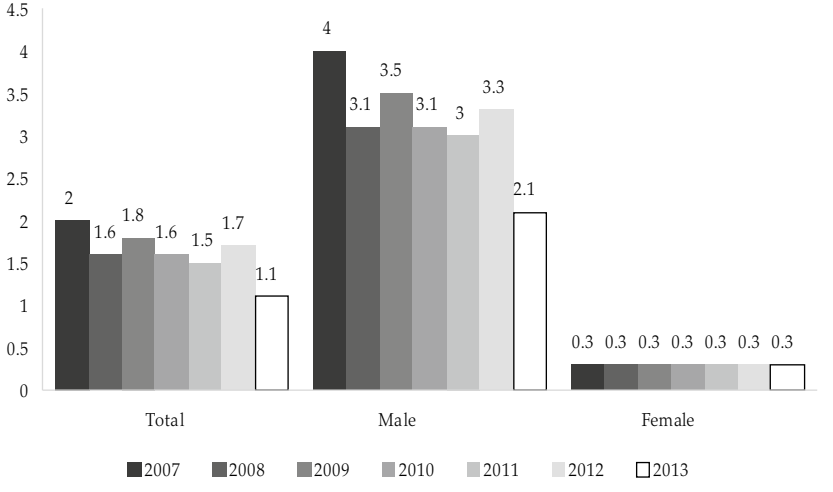


Table 2. Proportion of people of 18 years or older who reported alcohol abuse in the last 30 days preceding the survey, by sex, indicating a 95% confidence interval, according to the major regions, the units of the Federation and the household situation (2013)

Major regions, units of the Federation and household situation	Proportion of people of 18 years or older who reported alcohol abuse in the last 30 days preceding the survey (%)								
	Total			Sex					
				Male			Female		
	Proportion	95% confidence interval		Proportion	95% confidence interval		Proportion	95% confidence interval	
		Inferior limit	Superior limit		Inferior limit	Superior limit		Inferior limit	Superior limit
Brazil	13.7	13.1	14.2	21.6	20.7	22.5	6.6	6.1	7.1
Urban	14.2	13.6	14.8	22.3	21.3	23.4	7.1	6.6	7.7
Rural	10.3	9.2	11.3	17.3	15.4	19.1	2.9	2.2	3.5
North	14.2	12.9	15.4	23.1	20.8	25.4	5.7	4.9	6.5
Rondônia	11.1	9.2	13.1	17.7	14.5	20.8	4.9	2.9	6.8
Acre	12.4	10.7	14.1	17.6	14.4	20.7	7.7	5.9	9.5
Amazonas	13.4	11.8	15.1	22.9	19.9	25.9	4.4	3.1	5.7
Roraima	13.4	11.3	15.6	22.1	18.0	26.2	5.0	3.5	6.5
Pará	14.8	12.4	17.1	24.6	20.1	29.1	5.4	4.1	6.7
Amapá	17.6	14.6	20.6	25.7	21.0	30.5	10.2	6.8	13.5
Tocantins	15.9	12.8	18.9	24.0	18.9	29.1	8.2	5.6	10.8
Northeast	15.6	14.8	16.4	25.5	24.0	27.0	6.8	6.0	7.7
Maranhão	13.0	10.9	15.0	21.3	17.3	25.2	5.3	3.4	7.3
Piauí	17.0	14.9	19.2	28.5	24.5	32.5	6.4	4.8	8.0
Ceará	14.2	12.2	16.2	24.4	20.8	28.0	5.0	3.6	6.4
Rio Grande do Norte	16.5	14.7	18.2	28.7	24.7	32.7	5.8	4.1	7.4
Paraíba	10.9	9.3	12.5	18.3	15.3	21.3	4.5	2.8	6.2
Pernambuco	15.1	13.0	17.2	24.4	20.3	28.4	7.0	5.2	8.8
Alagoas	14.7	12.6	16.7	25.2	21.1	29.2	5.7	3.9	7.4
Sergipe	15.1	13.1	17.1	24.3	20.5	28.2	6.6	4.6	8.6
Bahia	18.9	16.8	20.9	29.4	25.6	33.2	9.7	7.2	12.1

Major regions, units of the Federation and household situation	Proportion of people of 18 years or older who reported alcohol abuse in the last 30 days preceding the survey (%)								
	Total			Sex					
				Male			Female		
	Proportion	95% confidence interval		Proportion	95% confidence interval		Proportion	95% confidence interval	
		Inferior limit	Superior limit		Inferior limit	Superior limit		Inferior limit	Superior limit
Southeast	12.8	11.9	13.7	19.9	18.2	21.5	6.6	5.8	7.5
Minas Gerais	14.0	11.7	16.3	21.1	17.2	25.0	7.6	5.6	9.6
Espírito Santo	11.5	9.3	13.7	17.4	14.0	20.9	6.1	3.5	8.6
Rio de Janeiro	13.5	11.8	15.1	19.7	16.7	22.7	8.3	6.8	9.8
São Paulo	12.1	10.9	13.4	19.5	17.2	21.9	5.6	4.5	6.7
South	11.1	10.0	12.2	17.6	15.6	19.6	5.2	4.2	6.2
Paraná	10.6	8.9	12.2	16.5	13.3	19.7	5.2	3.5	7.0
Santa Catarina	11.4	8.4	14.3	17.3	12.5	22.0	5.7	3.2	8.3
Rio Grande do Sul	11.4	9.8	13.0	18.9	16.0	21.9	4.8	3.4	6.2
Midwest	16.2	15.0	17.3	24.0	22.0	25.9	9.0	7.9	10.2
Mato Grosso do Sul	18.4	16.1	20.6	27.7	23.7	31.6	9.9	7.7	12.1
Mato Grosso	14.0	11.9	16.2	22.8	18.9	26.7	5.5	3.6	7.4
Goiás	16.6	14.5	18.8	22.9	19.4	26.4	10.9	8.6	13.1
Distrito Federal	15.5	13.6	17.4	24.6	21.0	28.2	8.0	6.3	9.7

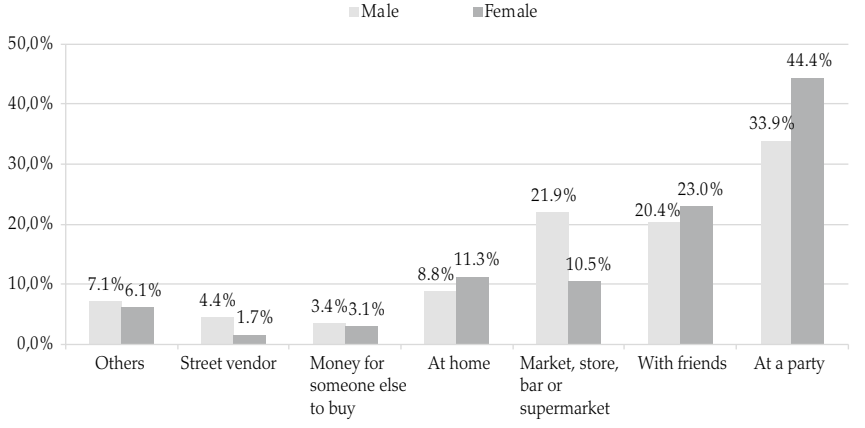
Source: IBGE, 2014.

Table 3. Prevalence and respective 95% CI of situations related to alcohol consumption, according to sex and school administrative dependence

Situations related to alcohol consumption	Total		Sex				School administrative dependence			
			Male		Female		Private		Public	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Try drinks	66.6	(64.0 – 69.2)	64.8	(61.4 – 68.1)	68.3	(66.2- 70.4)	71.3	(67.3 – 75.3)	65.6	(63.1 – 68.2)
Experiment one dose	50.3	(49.0 – 51.6)	48.7	(46.6 – 50.8)	51.7	(50.8- 52.6)	47.4	(46.0 – 48.9)	50.9	(49.6 – 52.2)
Drink on the last 30 days	26.1	(24.5 – 27.7)	25.2	(23.0 – 27.5)	26.9	(25.7- 28.0)	23.0	(21.3 – 24.6)	26.7	(25.2 – 28.3)
Intoxication	21.8	(21.1 – 22.5)	22.8	(22.0 – 23.7)	20.9	(20.1- 21.6)	18.6	(17.8 – 19.3)	22.5	(21.7 – 23.2)
Family would mind	92.2	(92.0 – 92.3)	91.3	(91.0 – 91.5)	93.0	(92.7- 93.3)	93.0	(92.2 – 93.8)	92.0	(91.7 – 92.2)
Having family problems	10.0	(8.9 – 11.1)	9.5	(9.0 – 10.0)	10.4	(8.7- 12.2)	8.4	(7.8 – 9.1)	10.3	(9.1 – 11.6)

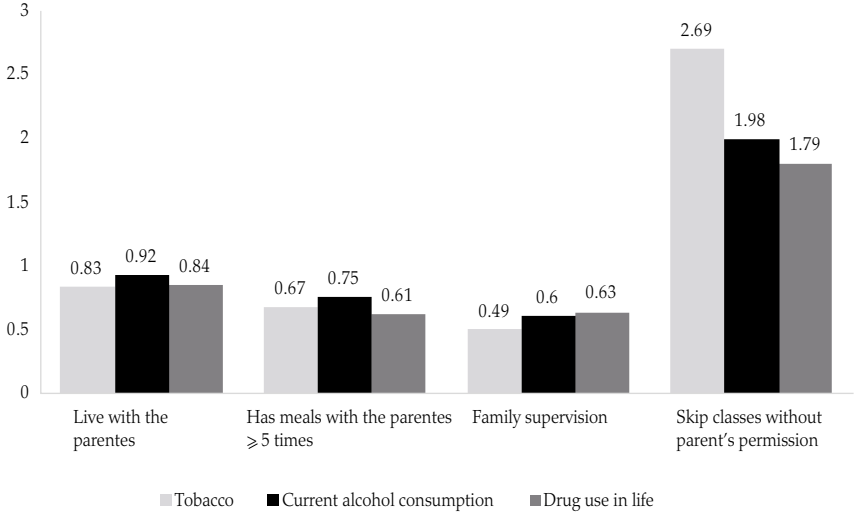
Source: Malta et al., 2014.

Figure 4. Place of purchase of alcohol among students of the 9th year of secondary school who reported use in the last 30 days, by gender



Source: Malta et al., 2014.

Figure 5. Influence of family background in the use of psychoactive substances



Source: Malta et al., 2014a.

Table 4 . Proportion (%) that declared alcohol consumption among victims of accidents and violence attended in sentinel urgency and emergency services, according to demographic characteristics. Selected cities and the Federal District – Brazil, 2011

Demographic characteristics	2011		
	Accidents	Violence	Total
Sex			
Male	14.6	50.3	18.7
Female	5.7	28.8	7.7
Age (years)			
18 – 29	12.7	43.3	16.6
30 – 59	12.2	45.7	15.6
60 and more	4.5	34.9	5.8
Race/color			
White	8.4	36.4	10.8

Demographic characteristics	2011		
	Accidents	Violence	Total
Black/mulatto	13.0	46.5	16.9
Yellow/indigenous	10.9	52.5	14.9
School (years)			
0 – 4	11.7	49.3	15.6
5 – 8	12.4	45.3	16.5
9 – 11	9.9	39.1	12.5
12 and +	8.5	28.1	10.0
Type of accident			
Transport accident	19.6	-	-
Fall	10.2	-	-
Burning	3.5	-	-
Other accidents[a]	5.0	-	-
Type of violence			
Assault/abuse[b]	-	45.2	-
Self-harm	-	33.8	-
Total	11.4	44.1	14.9

Source: Brasil, 2013b.

a) Includes: suffocation/choking, foreign body, drowning, poisoning/intoxication, injury by sharp object, injury by firearms, animal accidents, falling objects on the person, collision with object/person, sprain, crushing.

b) Includes intervention by public law official.

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Ultra-processed foods and chronic diseases: implications for public policy

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Ultra-processed foods and chronic diseases: implications for public policy

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The prevalence of obesity, diabetes and other noncommunicable diseases (NCDs) related to inadequate nutrition has increased worldwide, with special intensity in low- and middle-income countries (OMS, 2011). In Brazil, NCDs accounted for 72% of the causes of deaths in 2007 (Schmidt et al., 2011). In 2013, self-reported data from Vigitel (Risk and Protective Factors Surveillance System for Chronic Diseases by Telephone Interviews) showed, in the Brazilian adult population, the prevalence of overweight in 50.8% of people, obesity in 17.5%, diabetes in 6.9% and hypertension in 24.1% (Brasil, 2014a). This scenario has been driven, among other factors, by dramatic changes in production, distribution and consumption systems around the world (Popkin, 2006). These changes are characterized mainly by the gradual weakening of traditional eating patterns, based on raw or minimally processed food, and by the increased supply and access to ultra-processed food (Ludwig, 2011; Monteiro, 2009; Monteiro; Cannon, 2012; Monteiro et al., 2010; Moodie et al., 2013).

What are ultra-processed food?

Food processing is now the main element of the global food system and the determining factor to explain the relationship between food intake and health conditions of the population. However, the predominance of studies focused exclusively on the evaluation of the nutritional diet profile and the lack of assessments of the effects of industrial food processing limit our ability to monitor changes in eating patterns and their relationship to the rise of obesity and NCDs in the world.

The division of food only in unprocessed and processed does not have much use, since the vast majority of food is processed in some way. For a correct evaluation of the effects of food processing on health, it is necessary to identify the extent and goals of each type of food processing and how it affects the use of food.

Food classification according to the extent and purpose of industrial processing

Four food categories, determined by the type of processing used prior to its acquisition defined in this classification (Brasil, 2014b; Monteiro et al., 2012):

- Raw or minimally processed food;
- Culinary ingredients;
- Processed food;
- Ultra-processed food.

Raw of minimally processed food

Raw food are those obtained directly from plants or animals (such as leaves and fruit or eggs and milk) and purchased for consumption without having undergone any change after leaving nature. The acquisition of raw food is limited to a few varieties, such as fruits, vegetables, roots, tubers and eggs. Yet it is common that even these foods undergo any change before being purchased, such as cleaning, removal of inedible parts and cooling.

Minimally processed food are raw food which, prior to its acquisition, underwent cleaning, removal of inedible or unwanted parts, drying, packaging, pasteurization, cooling, freezing, fermentation and other processes that do not add any substance to the original food. Minimal processes increase the duration of raw food, preserving them and making them suitable for storage. They can also shorten the steps of preparation to ease your digestion or make the food more palatable. Some food commonly subjected to these processes are cereals, pulses, milk and meat. Processes

such as milling and refining, used in the production of flour and pasta, are also minimal.

Culinary ingredients

Vegetable oils (such as soybean, corn, sunflower and olive oil), fats (like butter and coconut fat), salt and sugar are food products manufactured by the industry by extracting substances existent in raw food or, in the case of salt, present in nature. These products are used for seasoning and cooking raw of minimally processed food and are rarely eaten alone.

Processed food

Processed food are manufactured products made essentially by adding salt or sugar (and eventually oil or vinegar) to a raw or minimally processed food. Processed foods are those who have suffered relatively simple modifications in order to extend the life of raw or minimally processed food and often to make them more palatable. Processed food, in general, is recognized as modified versions of the original food. Examples include canned vegetables, cereals, legumes and fish, fruit in syrup, salted meats (beef jerky, bacon, ham), cheese and bread made with wheat flour, water and salt (and yeast used to ferment the flour).

Ultra-processed food

Ultra-processed food are industrial formulations ready for consumption and made entirely or mainly out of substances extracted from food (oils, fats, sugar, starch, protein), derived from constituents of food (hydrogenated fats, modified starch) or synthesized in the laboratory based on organic materials (colorants, flavorings, flavor enhancers and several additives used to provide the products appealing sensory properties). Ultra-processed food usually have few (if any) amount of raw or minimally processed food in its composition. Ultra-processed food include sweet and savory cookies, chips, cereal bars, breakfast cereals, sweets in general, ice cream, fast food, instant noodles, various types of ready or semi-ready dishes, soft drinks, artificial juices, energy and milk drinks. Breads and other baked products are considered ultra-processed when, besides wheat flour, yeast, water and salt, the ingredients include subs-

tances such as hydrogenated vegetable shortening, sugar, starch, whey, emulsifiers and other additives.

Ultra-processed food and chronic diseases

Numerous characteristics related to composition, form of presentation and consumption patterns of ultra-processed food are problematic and contribute for them to become potential risk factors for obesity, diabetes and other NCDs

Population studies that have directly evaluated the association between consumption of ultra-processed food and morbimortality are still few because of the recent definition of this category of food. However, previous studies in Brazil indicate significant associations between the consumption of ultra-processed food with metabolic syndrome among adolescents (Tavares et al., 2012), dyslipidemia among children (Rauber et al., 2015) and obesity in all ages (Canella et al., 2014). A study based on a survey about food intake conducted in 2008-2009 on a representative sample of the Brazilian population of adolescents and adults showed that the 20% top consumers of ultra-processed food had about twice more chances to have obesity compared to those individuals in the lower fifth (Louzada et al., 2015a).

In the US, results of three cohort studies showed an association between weight gain and consumption of various ultra-processed food, such as potato chips, cookies, chips, sugary drinks and sausages (Mozaffarian et al., 2011). In addition, a study of 15 years of follow-up showed that the frequency of fast food consumption among young adults was directly associated with changes in body weight and insulin resistance (Pereira et al., 2005). Regarding sugary drinks, consistent evidence describe its role in the etiology of obesity and other NCDs (Hu; Malik, 2010; Woodward-Lopez; Kao; Ritchie, 2011). A study based on food-purchasing patterns for home in the UK explored the potential impact of reducing ultra-processed food consumption in the mortality from cardiovascular diseases in the country. In a scenario where all consumption of ultra-processed food is replaced by raw or minimally processed food, culinary ingredients and

processed food, the mortality from cardiovascular diseases would be 10% lower than expected and about 20,000 deaths could be prevented until 2030 (Moreira et al., 2015).

These results are corroborated by the analysis of sales statistics of ultra-processed food and its relation to the occurrence of obesity in Latin America. A study showed a strong association between the volume of ultra-processed food sale per capita and the prevalence of obesity among adults. In addition, the increase in sales of ultra-processed food between 2000 and 2009 was directly associated with the increase in average body mass index of the adult population in the same period. Countries like Bolivia and Peru, where sales of ultra-processed food are small and traditional food is still prevalent, have the lowest average body mass index. Mexico and Chile, where sales of ultra-processed food are high, have the highest body mass index values (OPAS, 2014).

Ultra-processed food are convenient, practical and portable. Generally, they are designed to be consumed anywhere - in front of TV, in the workplace or in transportation – and do not require the use of plates and cutlery. Most of the time, they are sold as snacks, drinks or ready or semi--ready dishes for consumption and can easily replace made-to-order meals, that use raw or minimally processed food. Besides, processing techniques, high amounts of sugar, salt and fats and the use of additives such as flavor enhancers and texturizing agents make them hyperpalatable. Thus, they can damage the endogenous processes that signal satiety, control the appetite and cause excessive consumption and mindless eating (Ludwig, 2011; Ogden et al., 2013).

Ultra-processed food have an unfavorable nutritional profile and impact negatively on the nutritional quality of food. Studies based on a survey about food consumption conducted in 2008-2009 in a representative sample of the Brazilian population of adolescents and adults showed that, on average, ultra-processed food have more saturated fat, trans fat and sugar free and lower fiber content when compared to raw or minimally processed food, even when considering the combination of these foods with culinary ingredients like salt, sugar, oils and fats. Increased participation of ultra-processed food on daily diet was associated with the increased use of saturated fat, trans fat and sugar free and inversely

associated with fiber content and protein. Only the 20% bottom Brazilian consumers of these food follow a diet that meets (or are close to) the recommendations of the World Health Organization for the prevention of NCDs (Louzada et al., 2015b).

Results equally unfavorable to ultra-processed food were found when evaluating the micronutrients content of Brazilian diet. Increased consumption of ultra-processed food showed an association, in an inverse and significant way, to the diet content regarding vitamins B12, D, E, niacin, pyridoxine, copper, iron, phosphorus, magnesium, potassium, selenium and zinc. The opposite was observed only with calcium, thiamine and riboflavin (Louzada et al., 2015c).

For possessing small amounts of water and fiber and large amounts of fat and sugar, ultra-processed food have high energy density and glycemic load. In solid form, its energy density may range from 2.5 kcal per gram of food, in case of certain breads, to about 5 kcal per gram, in the case of most cookies and chips. Analysis of the Brazilian survey about food consumption conducted in 2008-2009 showed that the set of ultra--processed food has 2.5 times more energy per gram than the set of raw or minimally processed food and the culinary preparations based on these foods (Louzada et al., 2015b). This is particularly relevant when considering that individuals regulate food intake mostly through the amount of food consumed other than the total calories and that the energy density is inversely proportional to the diet quality and directly related to the energy intake and weight gain (ROLLS, 2009). Similarly, the high glycemic load of these food increases insulin secretion, which can promote weight gain by diverting nutrients from the oxidation in skeletal muscle to storage it as fat (Ludwig, 2002). Furthermore, ultra-processed food can induce glucose intolerance, insulin resistance, cellular dysfunctions and inflammation, increasing the risk of developing the metabolic syndrome and diabetes (Schulze et al., 2004).

Food additives with cosmetic function, such as emulsifiers, thickeners and dyes, are widely use in the production of ultra-processed food to make them as or more attractive than food and the culinary preparations that replace them. Without those additives, products would be unpalatable. Although law permits their use, the evidences that these additives are

far from being considered harmless are growing. A recent review study suggests that the increased consumption of substances like emulsifiers, surfactants, organic solvents, microbial transglutaminase and nanoparticles may be associated with increased prevalence of autoimmune diseases during the past decades. The hypothesis is based on the fact that these substances damage intestinal protection mechanisms against external antigens and thus increase the risk of autoimmune diseases (Lerner; Matthias, 2015). Experimental study showed that mice that received low concentrations of emulsifiers commonly used by the industry – carboxymethyl cellulose and polysorbate 80 - showed alterations of the intestinal flora leading to inflammation, weight gain and metabolic syndrome (Chassaing et al., 2015). Non-caloric artificial sweeteners, originally developed to reduce calorie intake and blood glucose, are also associated with damages to the intestinal flora and the increase of glucose intolerance in mice and humans (Suez et al., 2014)

Ultra-processed drinks such as soft drinks and artificial juices have specific characteristics. Its consumption is associated with weight gain due to incomplete compensatory reduction in energy consumption in meals subsequent to fluid intake (Dimeglio; Mattes, 2000). Some compounds present in the formulation, such as advanced glycation end products, generated in the process of caramelization of cola beverages, can also affect pathophysiological pathways related to type 2 diabetes and metabolic syndrome (Uribarri et al., 2007).

The set of unfavorable characteristics of ultra-processed food is amplified by an aggressive and sophisticated marketing, which makes those products desired and ubiquitous and modify social norms, especially among vulnerable consumers, like children (Mallarino et al., 2013). Many marketing strategies of these products rely on unfounded health claims. In middle- and low-income countries, direct and specific marketing to lower-income communities is quite frequently, helping ultra-processed food industries, mostly transnational corporations, to penetrate rapidly in emerging markets.

Implications for public policy

Evidences and considerations made previously claim that the design of public policy to control NCDs in Brazil seeks to prevent the replacement of raw or minimally processed food and its culinary preparations by ultra-processed food. This becomes important when one observes that, since the 1990s, sales of ultra-processed food are intensely expanding in Brazil and, in general, in all middle-income countries (Monteiro et al., 2013). Research on food-purchasing patterns for home in Brazil's metropolitan areas, between 1987-1988 and 2008-2009, indicate systematic increases in the participation of ultra-processed food in all food purchases of Brazilian households and concomitant reduction in the share of raw or minimally processed food and culinary ingredients, such as oils, fats and sugar (Martins et al., 2013).

Although people obviously have great responsibility for their food choices, it is essential to recognize that the food environment affects those choices, which may hinder the adoption of a healthy diet. Therefore, it is important that public policies cover both information and education actions of individuals and promote environments that encourage healthy eating.

Institutionalization of actions to promote healthy eating

The success of public policies aimed at promoting healthy eating goes necessarily through the recognition of the conflict of interest inherent in the relationship between ultra-processed food market and public health agencies. Industry self-regulatory actions and public-private partnerships have proved to be very ineffective and often serve as marketing strategies of companies (Stuckler; Nestle, 2012). Therefore, the plan to tackle NCDs must begin by strengthening the state's regulatory capacity in the field of food production and commercialization.

Food guides

Currently, most food guides makes recommendations aimed exclusively to adequate nutrients intake and disregard other food consumption characteristics that influence the health conditions of the population.

Tackling NCDs requires a paradigm shift on what is healthy eating and the reformulation of local food guides

The importance of a new approach is very clear in the recent publication of the Ministry of Health: the new edition of the Food Guide for the Brazilian Population (Brasil, 2014b). The basic guide recommendations include the encouragement of regular consumption of a wide variety of raw or minimally processed food, the moderate use of culinary ingredients for the preparation of meals and limiting the consumption of processed food. The guide also emphasizes the importance of avoiding the consumption of ultra-processed food. The golden rule is simple:

Prefer raw or minimally processed food and culinary preparations rather than ultra-processed food. In other words, opt for water, milk and fruits instead of soft drinks, milk drinks and filled cookies; do not replace made-to-order meals (broths, soups, salads, sauces, rice and beans, pasta, vegetable stews, *farofas* and pies) for products that dispense food preparation (canned soups, instant noodles, frozen dishes, sandwiches, cold cuts and sausages, mayonnaise and processed sauces, cake mixes); and stick with homemade desserts, dismissing the industrialized ones (Ibid., p. 47, free translation).

The guide also offers dining models for breakfast, lunch and dinner derived from actual meals selected from those practiced by Brazilians belonging to the lower fifth of the population that least consumes ultra-processed food, including men and women, adolescents and adults and people living in urban or rural areas from various regions. Additional recommendations on the act of eating and table sharing include eating mindfully, in appropriate places and whenever possible with company. The final chapter discusses the obstacles that may hinder the adoption of the guide's recommendations, including information, supply, cost, time, lack of culinary skills and advertising, and proposes individual and group actions necessary to overcome these obstacles.

Promotion, protection and support actions for breastfeeding and complementary healthy eating

The eating habits early in life are determinants of dietary habits and health conditions of adult life. Thus, actions that encourage the practice

of breastfeeding and the introduction of a complementary diet based on raw or minimally processed food and discourage the use of ultra-processed food - including infant formula and manufactured baby foods – are extremely relevant. These strategies, part of the National Breastfeeding Policy, include, for example, mass campaigns for promoting breastfeeding, prohibiting the marketing of infant formula and the regulation of advertising of other products intended for children, legislation on maternity leave and breastfeeding in the workplace and participation in the Baby-Friendly Hospital program.

In Brazil, the Food Guide for Children Under the Age of Two also features a more traditional approach to food, but also encourages the consumption of raw and minimally processed food and alert to the consumption of some ultra-processed food. Among its recommendations is the encouragement of exclusive breastfeeding up to six months and, after that age, the consumption of different culinary preparations based on regional ingredients. The guide also recommends avoiding sugar, coffee, canned food, fried foods, soft drinks, candies, snacks and other sweets in the early years of life (Brasil, 2013). The Brazilian Breastfeeding and Feeding Strategy enables primary care professionals to the guide's content, promoting healthy eating in childhood under the National Health System.

Promoting healthy eating at school

Concrete evidence demonstrate the effectiveness of interventions in school to promote healthy eating and physical activity (Lobelo et al., 2013). Actions to ensure children's access to meals based on raw or minimally processed food and restricting the supply of ultra-processed food have a potential protective effect against NCDs. Among these actions, we highlight the establishment of guidelines for national school feeding programs, the regulation of food sold in schools and the prohibition of food marketing at school. The Brazilian school feeding program has advanced a lot in this direction and today its guidelines prohibit the purchase of soft drinks and other sugary drinks, limit the purchase of processed foods and require that at least 30% of the school budget is used to buy food from family farming.

Regulations of the advertising of ultra-processed food for children

Abundant evidence shows that children and adolescents are especially vulnerable to food advertising (James, 2011). Because of this, they are prime targets of the ultra-processed food industry. International organizations like the World Health Organization and the Pan American Health Organization strongly recommend that initiatives to reduce the consumption of ultra-processed food go through, necessarily, the regulation of food advertising.

In 2006, the Brazilian Health Surveillance Agency published a proposal for the regulation of advertising of foods high in sugar, sodium, saturated fat and trans fat. The document was prepared with broad participation of the society and the final text was published on June 15, 2012. The resolution, however, was challenged in court by different sectors and associations (most related to the food industry) and was suspended by federal prosecutors.

Fiscal policies

Tax subsidies and food taxation are effective and sustainable strategies to modify dietary intake (Mozaffarian; Rogoff; Ludwig, 2014). Some studies indicate that the protection of agriculture, subsidies for the production of fruits and vegetables and taxing soft drinks and snacks with high energy density promote diet quality and reduce the risk of obesity and cardiovascular disease (Eyles et al., 2012; Thow; Downs; Jan, 2014). In Brazil, a study demonstrated that increasing the price of sugary drinks by 1% would cause a decrease in the consumption of calories from these drinks by 0.85% (Claro et al., 2012).

Nevertheless, the creation of tax policies to raise the cost of ultra-processed food and the effectiveness of tax subsidies for family farming in Brazil and in all Latin America are hindered by policies that favor the uncontrolled market opening for transnational food, fostering agribusiness and the lobby of the food industry.

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Regulating risk factors for chronic disease: Experiences from the United States

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Regulating risk factors for chronic disease: Experiences from the United States

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The United States preceded Latin America in its path to a dominance of noncommunicable disease. But even as the rest of the Americas joins us in this demographic transition, we are still discovering the paths to systematically prevent or postpone these illnesses. Today's epidemiology of cardiovascular disease, diabetes, cancer and pulmonary disease was built on pyramids of social inequality, societal and technological transformation, and deep economic interests. A piece of very good news in the US is that from 1980 through 2009, coronary heart disease mortality decreased by two thirds[1], an extraordinary change thought due roughly half to primary prevention and half to medical care.[2] The bad news is that obesity and diabetes have increased markedly in the same time period, and deep inequities persist. While tremendous medical and technological progress has been made, tearing down the edifices of preventable illness will require more than new miracle drugs. To change that situation, without rendering most adults dependent on invasive medical treatment or expensive drugs, will require a more fundamental examination of the building blocks that lead to chronic illness and a rebuilding of our house. This paper will briefly examine how some of those building blocks are being addressed in the United States. Specifically, with a short examination of approaches to social inequality, dietary risks, tobacco and physical inactivity.

Economic and social inequity

Perhaps the most striking characteristic of the burden of chronic disease in the US, as in other nations, is the inequity in its distribution. This inequity is present both in the incidence of many chronic diseases, and in

their outcomes such as hospitalization or death. Income inequality, which had fallen after the crash of 1929, has been increasing steadily in the United States since the 1970s, and now has reached levels not seen since 1928. In 2012, for the first time, the bottom 90% had less than half of the income of the nation.[3] Housing has become increasingly expensive and difficult for many families. Nevertheless some progress on social determinants has been made, for example the percentages of children who graduate on time from high school has increased for all, and for black and Latino children. [4] Homicide has fallen significantly. [5] Implementation of the Affordable Care Act reforms has reduced, but not eliminated, disparities in access to health care, with the percentage of uninsured individuals falling from 18% in 2013 to 11.2% in early 2015.[6] Yet income and race continue to be major determinants of chronic disease incidence and outcomes. For example, Latinos and African Americans in California are roughly twice as likely as non-Hispanic whites to have diabetes or to die from it.[7] In short there is a mixed pattern of progress and backwards movement in addressing basic social determinants that will be reflected in the epidemiology of chronic disease for years to come. Some public health systems attempt to address the basic social determinants underlying chronic disease as part of their work, but this occurs only in a small, but growing, number of jurisdictions. Many other social forces also work to reverse these inequalities. Yet others forces work to aggravate them. Governmental political approaches to income equality vary widely across the country, from conservative governments that have dismantled protections for workers and made taxation more regressive, to administrations that have increased the minimum wage or explicitly sought to reduce inequality. Mayor De Blasio of New York City recently made reduction of income inequality the centerpiece of the City's long term Strategic Plan, OneNYC, pledging to lift 800,000 residents out of poverty over the next decade and significantly reduce the racial and ethnic disparities in premature mortality[8]. It will be important to follow this unusually explicit effort of a major urban center to buck the national trend. While this paper will not review the complex range of social determinants, their importance in determining the distribution of chronic disease cannot be ignored.

Environmental and behavioral risk factors

Globally, four major "behavioral" risk factors underlie more than two thirds of all new cases of noncommunicable disease: unhealthy diet, tobacco use, physical inactivity and harmful use of alcohol.[9] Table 1 highlights the top underlying causes of death in the Global Burden of Disease analysis in the United States, recognizing that these causes interact. For example dietary risks and physical inactivity can in turn generate elevated body mass index, and high cholesterol, plasma glucose and blood pressure.

Table 1. Underlying causes of death United States 2010

Cause	Number of Deaths
Dietary Risks	678,000
Tobacco Smoking	466,000
High blood pressure	443,000
High body mass index	364,000
Physical inactivity	234,000
High fasting plasma glucose	214,000
High total cholesterol	158,000
Ambient particulate matter	103,000
Alcohol use	89,000

Source: Institute for Health Metrics, 2015, accessed at: http://vizhub.healthdata.org/gbd-cause-patterns/

While some of these are often referred to as"behavioral risk factors" many should be thought of environmental risk factors. Just as people breathe polluted air and fall ill because the air surrounds them, people eat unhealthy food and travel in cars because it is what surrounds them, and it requires a very conscious set of choices to do otherwise. A major effort of the public health community over the past decade in the US has been to shift from primarily educational approaches to modify individual behavior, with limited effectiveness, to one based on changing these environmental determinants of risk of chronic disease. But that shift is occurring unequally and with limited reach, and requires building broader social con-

sensus for the needed level of transformation. Table 2 presents some of the policy and regulatory approaches that are in use or have been attempted in the US or other countries to address tobacco, dietary risks or alcohol. It is clear that the strategies to address NCD risks that arise from these three groups of consumer products have many common traits, addressing for example the products themselves (composition, packaging, labeling or size), their price, the places they are sold or used, how they are promoted, and their economic impact. Better coordination of measures across NCD risk factors is a potential opportunity, but in general they have been addressed one by one.

Table 1. Policy and regulatory strategies in use or attempted for tobacco products, dietary risks and harmful use of alcohol *

Type of Change	Strategy	Tobacco Use			Unhealthy Diet						Harmful Use of Alcohol
		WHO TARGET: 30% Reduction**			WHO TARGETs: Halt rise of diabetes and obesity, 30% reduction in salt intake, eliminate trans fat**						WHO TARGET: 10% Reduction**
		Cigarettes	E-Cigarettes	Other	Fruits & vegetables	Sugary Drinks	Fast food	Trans Fat	Salt in Food	Energy dense nutrient poor foods	Alcohol
Retail practices	Promote availability of healthy products				✓						
	Require Retailer License	✓	✓	✓							✓
	Restrict Density/ Location of Retailers	✓	✓	✓			✓				✓
	Restrict Near Schools	✓	✓	✓			✓				✓
	Prohibit self-serve	✓	✓	✓							
	Restrict Product Display/Settings	✓	✓	✓						✓	✓

Type of Change	Strategy	Tobacco Use			Unhealthy Diet						Harmful Use of Alcohol
		WHO TARGET: 30% Reduction**			WHO TARGETs: Halt rise of diabetes and obesity, 30% reduction in salt intake, eliminate trans fat**						WHO TARGET: 10% Reduction**
		Cigarettes	E-Cigarettes	Other	Fruits & vegetables	Sugary Drinks	Fast food	Trans Fat	Salt in Food	Energy dense nutrient poor foods	Alcohol
Restrictions on products	Product Portion/ Package Size Restrictions	✓				✓					✓
	Product Prohibition		✓	✓			✓	✓			✓
	Content limits						✓	✓	✓		✓
	Plain Packaging	✓									
Information	Warning labels	✓	✓	✓		✓			✓		✓
	Mandated Information for Consumers	✓	✓	✓		✓	✓	✓	✓	✓	✓
Price	Excise Taxes	✓	✓	✓		✓				✓	✓
	Sales Taxes	✓	✓	✓		✓	✓			✓	✓
	Minimum price	✓									✓
	Restrictions on Discounting	✓	✓	✓							✓
Marketing	Prohibition on marketing to children	✓	✓	✓		✓	✓	✓	✓	✓	✓
	Restrictions on time place and manner	✓	✓	✓		✓	✓	✓	✓	✓	✓
	Broad prohibitions for all age groups	✓	✓	✓							✓

Type of Change	Strategy	Tobacco Use			Unhealthy Diet						Harmful Use of Alcohol
		WHO TARGET: 30% Reduction**			WHO TARGETs: Halt rise of diabetes and obesity, 30% reduction in salt intake, eliminate trans fat**						WHO TARGET: 10% Reduction**
		Cigarettes	E-Cigarettes	Other	Fruits & vegetables	Sugary Drinks	Fast food	Trans Fat	Salt in Food	Energy dense nutrient poor foods	Alcohol
Social environment	Regulations for second hand smoke	✓	✓								
	Regulations on day care practices	✓	✓		✓	✓	✓	✓	✓	✓	✓
	Regulations on school practices	✓	✓		✓	✓	✓	✓	✓	✓	✓
	Regulations on workplace practices	✓	✓			✓		✓		✓	✓
	Regulations on public spaces	✓	✓			✓				✓	✓
Other economic approaches	Agricultural subsidies (add or eliminate)	✓	✓	✓	✓						
	Public Procurement policies (promote or restrict)				✓	✓	✓	✓	✓	✓	✓
	Land use/agricultural use or urban zoning policies	✓	✓		✓						
	Incentives/ subsidies for citizens				✓						

✓ = In use or passed somewhere in the US (may be used internationally as well)

✓ = In use internationally but not in the US

* Adapted from PAH0, 2015[10]

Dietary Risks

The U.S. is a leader in the international obesity epidemic. Its food marketplace is dominated by highly processed and unhealthy foods and beverages. Unhealthy diet is the largest leading underlying risk factor for death. At the same time it is a major agricultural producer. The nation has been largely successful in increasing the availability of low cost food and diminishing hunger, but today the poorest and most food insecure suffer most from the poor quality of affordable foods, and are the most likely to be obese.

Efforts to reduce risk from diet have encompassed nutrient specific approaches, place based efforts, informational approaches, fiscal policy and broader efforts to shift the nature of food production and the food supply. Some examples stand out. The US has been successful at greatly reducing consumption of trans fat since national labeling went into effect in 2006, and a round of local legislation further restricted the substance. A federal ban may be finalized this year. While a national voluntary effort to reduce salt consumption, coordinated by New York City, has been underway since 2010, the federal government has not moved forward with either voluntary or regulatory measures to date. Saturated fat consumption has not declined. Some companies have reduced salt across the board or for certain products, for example Walmart reduced it by 16% across its portfolio, but corporate buy in is still far from comprehensive.[11] This stands in contrast to progress in the UK with a government led rigorous voluntary campaign. Or to the combination of voluntary and regulatory measures in Argentina, for example. [12] The combination of education, policy and regulatory efforts has been associated with a decline of 20% in consumption of soft drinks between 2000-2013. [13] However the industry has innovated in response, and sugary energy drinks, sports drinks and teas are on the rise, as is bottled water.

Efforts to create more rigorous requirements for food in place based settings such as daycare centers, schools, hospitals and workplaces have advanced. National legal requirements for healthier school food have been strengthened through the Healthy Hunger Free Kids Act of 2010 ,[14] but are still threatened with legislative reversal. Daycare food and physical

activity was regulated in New York City in 2007 with associated reductions in early obesity. National daycare standards for publicly subsidized food are under revision, and efforts to extend similar measures voluntarily are underway. [15,16,17] Many hospitals are getting rid of sugary drinks and seeking to improve their food offerings. Local governments are increasingly adopting broader public food procurement standards that apply to a wide range of publicly funded or served food or to food sold in publicly owned places. [18]

Other efforts have worked to assure that fruits and vegetables and a broader variety of foods are available even in low income or rural areas that are often characterized as "food deserts." The effectiveness of these measures is not yet clear. In general, efforts to expand access to healthy foods has been less controversial and better accepted than the equally or more important efforts to reduce the ubiquity of unhealthy foods and beverages. These latter efforts have been far more controversial and strongly resisted by the food industry, although gradual progress has been made on some issues, like children's fast food meals.

Rapid expansion of portion sizes for sugary drinks,[19] junk food and a wide range of foods has also been an important contributor in the US. In the 1950s the only size soda at McDonalds was 7 ounces (207 ml). Today that is smaller than their drink for children and beverages in some stores have reached almost 2L. New York City broke ground in passing a law that would modestly restrict sugary drinks in restaurants to 16 ounces (473 ml),[20] however that measure was blocked on a legal technicality by the courts. There has been no attempt yet to regulate allowable package sizes more broadly in the retail market. Interestingly, McKinsey Global Institute estimated that reductions in portion sizes sold may be the most effective intervention for obesity.[21]

Efforts to reduce marketing of unhealthy products to children – or adults – have been very difficult in the U.S. due to current interpretation of constitutional protections for freedom of speech, which have unfortunately been extended by the courts to apply to commercial speech. This has made regulation of marketing of harmful products, even to children, extremely challenging. Efforts by the Obama administration to develop even voluntary guidelines were blocked by Congressional opposition

and the Federal Trade Commission even stopped their monitoring of this marketing.[22]

Information for consumers is showing modest improvements. New York City's innovative 2006 requirement for labeling of calories in chain restaurants survived lawsuits and spread widely. In 2009 menu labeling was included in the national health care reform bill and Federal regulations were finally issued five years later in 2014, and will go into effect nationally in December of 2015.[23] This will require prominent information on calories of prepared foods in chain fast food and other restaurants, and many vending machines, movie theaters and grocery chains. Proposed revisions to mandatory nutrition facts labels on packaged food products are also under consideration and would offer some progress,[24] however they fall far short of the clarity and impact of front of pack labeling systems such as those used in Chile and Ecuador with clear graphic warnings to consumers about unhealthy products. [25]

Modifications of fiscal policy have advanced extremely slowly. Proposed substantial taxes on sugary drinks had failed to pass in over 30 jurisdictions, until November 2014 when the first measure was approved in the small City of Berkeley, California.[26] Berkeley's is a 10% tax, similar to Mexico's. A smaller tax, and one that incides on both soda and junk food was also passed in the lands of the indigenous Navajo Nation. Evaluation of the Berkeley measure is underway. A national tax – the Sweet Act - has been proposed, but is unlikely to progress at this time. Yet at the same time federal food subsidies to families can be used to purchase sugary drinks, generating a $4 billion dollar annual public subsidy to the soda industry,[27] and demonstrating the contradictory impact of public policies in different spheres.

Others are working to encourage a broader reformulation of food production and food supply, often uniting goals of better nutrition and environmental sustainability. This has been reflected in the rapid spread of local Food Policy Councils. These councils have addressed a variety of issues including adoption of more sustainable food production methods, increased access to fruits and vegetables, community gardens, greater use of locally produced foods through farm to school and farm to fork programs, economic incentives for fruit and vegetable consumption, incre-

ased neighborhood availability of healthy foods and conditions for those working in agriculture and food sectors. Councils are also collaborating regionally and nationally to increase their impact on state and national food policy. [28] One policy initiative that has grown out of this work is an incipient effort by the large Federal supplemental nutrition assistance program (SNAP), which provides low income families with grants for purchasing food, to pilot incentives for purchase of fruits and vegetables.

The recent Report of the US Dietary Guidelines Advisory Committee significantly advanced the national discourse both in terms of proposed policy measures for improving the food supply and its emphasis on a more holistic approach to foods and sustainability. [29]

In short, levels of awareness and of action on the risks posed by an unhealthy diet have risen substantially in the US over the last decade, and efforts to transform the food supply are multiplying. However these efforts are very unequally distributed across the nation and have limited reach. They have only just begun to change the face of the food supply. Far more deep-seated changes to the nature of food sold in our supermarkets, restaurants and other commerce are still urgently needed.

Tobacco

The United States has been home to groundbreaking work in the field of tobacco control. Fifty years after the landmark 1964 Surgeon General's report: *Smoking and Health*, enormous progress has occurred. Adult smoking rates have fallen from about 43% in 1965 to about 18% in 2014. Rates of death from lung cancer, the leading cause of cancer death, are declining. Nevertheless, over 40 million Americans still smoke, including over 3 million middle and high school students. Tobacco has killed more than 20 million people prematurely since the first Surgeon General's report in 1964. Unfortunately the rate of decline in smoking has slowed and deaths attributable to smoking are expected to remain high unless action is taken. Part of this persistence reflects the creative adaptive strategies of industry to induce and maintain nicotine addiction. More people are using multiple tobacco products, particularly young peo-

ple. This reflects the introduction into the US market of e-cigarettes, and diversification of small cigars and smokeless tobacco in a wide range of flavors and product designs designed to attract the young, from mango to chocolate. The percentage of U.S. middle and high school students who use electronic, or e-cigarettes, more than doubled between 2011 and 2012. The economic costs attributable to smoking in the US were estimated at US $289–332.5 billion between 2009–2012 and reflect both direct medical care of adults and lost productivity due to premature death and secondhand smoke.[30]

Current efforts are focused on expanding now strongly evidence--based policies that include taxation, smoke free air, increased tobacco addiction support free of barriers to use, warning labels, public health campaigns, and restrictions on advertising, promotions, and sponsorship. Public investments in tobacco control have been directly correlated with rates of smoking in the young. However funding and political commitment have been insufficient to fully implement these strategies and reach the entire population at recommended levels. Only two states reached the levels of tobacco control funding recommended by the Centers for Disease Control and Prevention in 2014, and over 40 were at less than half that level. [31]

The US was a pioneer of local smoke free air policies. California was the first state to require all workplaces, bars and restaurants to be smoke free in 1998. Prior to 1998 few such comprehensive policies were in place anywhere. This was preceded by decades of progressive development of stronger smoke free policies. By 2011, nearly 8 of every ten Americans was covered by 100% smoke-free air legislation (in non-hospitality workplaces and/or restaurants and/or bars).[32] Tobacco taxation levels vary widely across the nation, from $0.46 per pack in Missouri to $4.75 per pack in New York, leading average pack prices to vary from $4.41 top $10.29[33]. A few jurisdictions have established minimum price policies or prohibited discounting of tobacco products as complimentary roads to keep prices high.

Additional local policies that are advancing include extending smoke-free air laws to cover e-cigarettes or multi-unit housing, prohibiting flavored tobacco products, creating more rigorous local tobacco retail

license requirements, which may include reducing density, proximity to schools, sales in pharmacies or other considerations.

Tobacco control efforts were for many years primarily state or local in nature, but since the Food and Drug Administration received the authority to regulate tobacco products in 2009, the Federal government has begun to play a more active regulatory role. The Federal government has also recently stepped up its national media campaigns, and support to local government, with immediate impact on quit attempts.

However, many advocates feel that this work is advancing too slowly. The American Lung Association in its annual State of Tobacco Control gave the Federal government a "failing grade" on regulation, taxation, for failing to ratify the Framework Convention on Tobacco Control after its initial signature, and a slightly higher assessment for addiction support. They would like to see the new Federal authority used more proactively and promptly to protect health.

Tobacco addiction support is now a mandated preventive service for almost all health insurance in the US since the 2010 Affordable Care Act was approved,

Some strategies adopted in other countries have or would face legal challenges in the US, such as outright bans on advertising, plain packaging, stronger point of sale counter-advertising, hiding the product in stores in closed cabinets, or stronger graphic packaging requirements. These mostly revolve around the Supreme Court interpretation of US freedom of speech requirements that also restrict our ability to regulate marketing of unhealthy foods. For example, warning labels of insufficient prominence, have been on tobacco products for many years, but a 2011 rule to require prominent graphic warnings on all packs was blocked by the courts in 2012[34].

In general, in the US, as in other countries, it appears that a combination of measures in different areas and constant refreshing of strong tobacco control strategies is needed to keep the curve of tobacco use declining. Since some avenues are closed due to US law, it will be urgent to both fully implement proven strategies and continue to test innovative policies.

Perhaps the most important discussions underway today look at so-called "end-game" strategies.[35] These include reducing or eliminating nicotine, the main addictive substance in tobacco products to reduce addiction, or strategies to reduce sales, including banning entire classes of tobacco products, as Brazil has done with e-cigarettes, for example. However these "end-game" strategies have not yet been adopted in the United States, with the exception of restrictions on certain flavored cigarette products nationally and other products locally. Marked reduction or elimination of nicotine from tobacco products to reduce addiction may be the highest impact end-game option. This approach was proposed by US researchers[36] and continues under investigation, but needs to be implemented and evaluated.

In short, in spite of early leadership, innovation and strong progress, ending tobacco addiction is a battle only half won in the United States.

Physical Inactivity

The US, often envisioned as the home of tough pioneers and cowboys, is now also home to one of the more sedentary and obese populations in the word. The US helped create the well-known suburban sprawl model of housing development, malls and freeways, completely dependent on cars for transportation and often with limited public transportation. Our technological development has simultaneously designed much physical activity out of daily life, from escalators and elevators, to washing machines, forklifts and food processors. Television, computers, smart phones and tablets occupy our time for both work and entertainment. In many communities recreational spaces are lacking or unsafe, although in others wonderful opportunities for recreation abound.

Strategies to increase physical activity include traditional educational messages, efforts to increase safety and availability of active transportation, transformation of urban and rural planning to create more sustainable mixed use communities, greater access to recreational spaces, and expansion of physical activity opportunities in placed based settings including childcare, schools and workplaces. As is the case for diet and

tobacco, the emphasis has gradually shifted from individual education to one of policy and environmental change.

National surveillance of physical activity patterns is not as robust as for other risk factors. However leisure time physical activity does appear to have increased somewhat since 1998. National Health Interview Survey data show that the number of adults meeting 2008 Physical Activity Guidelines for Americans increased from 14.3% in 1998 to 20.7% in 2010[37] However these increases in leisure-time physical activity may offset by reductions in energy expenditure at work and sedentary behavior. Daily occupation-related energy expenditure has been estimated to have fallen by more than 100 calories over the last 50 years.[38] Screen time (time that people spend watching television and videos, playing video games, or using a computer) has also increased nationally.[39]

The most comprehensive approaches to increasing physical activity are looking at how to transform our communities. One early effort was New York City's Active Design Guidelines.[40] This brought together public health leaders, together with architects, planners and design and construction leaders. They reviewed the evidence and designed a set of recommendations for making city buildings and streets more conducive to physical activity. These went from opening up stairwells, to placing trees on streets and using greater mixed use neighborhood planning. This effort, which grew out of a FIT-City Initiative, and later to a Fit –Nation initiative trained architects, planners and designers to sensitize them to the impact of design and planning on physical activity and health. Aspects were also integrated into city contracting policy. City transportation authorities have been leaders in promoting active transportation and building bike lanes and additional public transportation routes. Bike share programs have spread across major cities rapidly. Similar guidelines are being developed in other communities with a range of characteristics from urban to rural.

In general requirements for traditional physical education in schools exist across the country. However many schools fail to comply and many states issue waivers on a large scale. A number of approaches are being used to increase physical activity before, during and after school, whether in the classroom, outside the school or the gym. Regulations of the daycare environment to require physical activity and reduce screen-

time (as well as assure healthier food), have been used in New York City to increase physical activity in young children and were associated with decreased obesity rates. Workplaces are being encouraged to offer physical activity opportunities onsite, support active transportation for staff, and to support workers engaging in physical activity in other settings

Safe routes to schools programs have been one of the most active areas of promoting physical activity. In 1960 roughly half of US children walked or bicycled to school, but today fewer than 15 percent of schoolchildren do so.[41] This is a major contributor to kids being less active and healthy. Driving children to school is also a significant contributor to use of fossil fuels and increased traffic. Concerned by both the transportation and health effects of this issue, Federal funding has been allocated since 2005 to promote safe routes to school nationally. Communities can use transportation funds to construct new bicycle lanes, pathways and sidewalks, as well as to launch Safe Routes to School campaigns in elementary and middle schools. In California an innovative statewide Active Transportation Program combines Federal funds and funds from measures to control climate change to promote walking, biking and public transportation use. Its first round in 2014 included 265 projects utilizing US $367 million in program funds. Of this amount, $311 million was dedicated to 220 projects in disadvantaged communities.[42] Safe Routes to School projects were an important component of this funding.

Public health departments across the nation are now also beginning to build active collaborations with their planning, transportation and design counterparts in government. While this is still a minority of jurisdictions, examples of collaboration and recognition of the synergies between health, sustainability and quality of life are growing rapidly. In California for example, public health has been actively involved in revising the statewide recommendations for local general plans, the legal documents that guide community design, and local departments at the county and city level have been actively engaging to ensure that the built environment of their communities promotes physical activity, healthy eating and greater equity.

One of the most innovative programs in the nation come from California's Strategic Growth Council which is seeking to reduce gree-

nhouse gas emissions and working in the interface between health and prevention of climate change. Twenty percent of funds from the large California cap and trade program to reduce greenhouse gas emissions are being used to fund the Affordable Housing and Sustainable Communities Program, which began in 2014. This program seeks to: a) Reduce air pollution; b) Improve conditions in disadvantaged communities; c) Support or improve public health; d) Improve connectivity and accessibility to jobs, housing and services; e) Increase options for mobility, including active transportation; and f) Protect agricultural lands to support infill development. In short it will help prevent chronic disease by building communities whose very design will promote active transportation and reduce pollution, as well as increase access to housing. It is likely this type of "health in all policies approach" that will be needed to reverse the underlying environmental characteristics that reduce physical activity, particularly in relation to transportation. [43] The Strategic Growth Council is also home to California's Health in all Policies Task Force, a high level council that brings together the leadership of state agencies to identify intersectoral priorities for promoting health.

Barriers

Three key barriers are common roadblocks for advancing this work. The first is funding. While the US health care delivery system is extremely well funded, its prevention activities are not. The health care reform law created the Federal Prevention and Public Health Fund, but that fund has had its proposed appropriations reduced and currently receives only about $3 per capita. There are also significant restrictions on how funds can be used, particularly for policy measures, which reduces its impact. Only some communities receive funding, based on competitive bidding, so it is not a steady funding stream, although it is an important start. One or more additional, larger sources of funding to sustain noncommunicable disease prevention activities and expand their reach to cover the entire country is badly needed. A few states have experimented with creating their own "Wellness Trusts". The state of Minnesota's State Health Improvement

Program is funded by fees on health care providers, for example and funds are distributed to every county for evidence based interventions to prevent chronic disease. Taxes on unhealthy products such as sugary drinks or tobacco could represent an alternative funding stream, as is occurring in Berkeley, and are being proposed for that purpose in a number of jurisdictions. Establishing adequate funding flows for prevention is one of the critical challenges facing the US health system. Nevertheless, Health in All Policies approaches such as those beginning in California can help assure that resources from other sectors such as transportation are used in ways that will have more positive health impact.

The second major barrier is that of building human capacity within the public health system, and partner agencies, particularly regulatory capacity. In general the background and training of most public health professionals does not prepare them well to regulate the food supply, or take on large corporate interests such as tobacco companies or Coca-Cola. The regulatory capacity of health departments locally and nationally is limited even for traditional activities like preventing foodborne outbreaks, and is far weaker for preventing chronic diseases from dietary risks. Building this capacity at all levels of government is a second challenge. That capacity may range from the ability of health sector professionals to carry out surveillance of these risk factors to their ability to act as a force for change. It may require creating new legal frameworks, institutional structures and funding streams as well as human resources, as we are seeing in the US. This needed capacity will encompass the skills to assess risks, formulate or implement regulatory and other policy measures and programs to reduce risks from tobacco, alcohol and unhealthy foods to an ability to work effectively across sectors to create a healthier food supply and built environment and to reduce in inequities in social determinants.

The third barrier is that of the political will to confront vested economic interests that benefit from the status quo. For physical activity this may be land or housing developers with an established way of doing business. For smoking it is the tobacco industry, which has long been a daunting and creative opponent. Today the food industry is increasingly a force that is opposing essential measures to prevent diet related noncom-

municable disease. Unlike the tobacco industry, people will always need food, and there are many healthier alternatives they can sell. But the food industry has opposed most changes, and is adopting the same nefarious tactics used in the past by the tobacco industry.[44] As has been the case for tobacco control, building understanding of the issues and the strong organized support of civil society is proving to be an essential ingredient for success on food policy, in the US and elsewhere. Investments in tobacco research, surveillance, advocacy and coalition building have been fundamental to enabling progress in tobacco policy. It will be no different for reducing the risks from the food supply, alcohol industry or other chronic disease risks that require challenging strong economic interests.

Conclusion

Successfully preventing noncommunicable requires a coordinated and comprehensive effort to reduce the major underlying risk factors. This is the case in the United States and globally. While major progress has been made on reducing coronary heart disease, obesity and diabetes are still expanding epidemics. Similarly, our control of key risk factors is unequal across the nation and insufficient. Without reducing social inequity the burden of noncommunicable disease in the US will continue to be unfairly shouldered.

We have made major progress on tobacco control, but vanquishing death from tobacco will require full implementation of existing approaches, including the full scope of the FCTC, and potentially a new generation of "end-game" solutions.

The greatest progress in increasing physical activity is likely to come from the synergies with creating more sustainable transportation systems and community design over the coming years that bring activity back into daily life. That will require legal and regulatory strategies as well as changes in planning culture. But promotion of leisure time and placed based activity will also be important to creating new social norms in an era when many occupations no longer require great physical exertion.

Dietary risks are the leading behavioral risk factor and their impact on NCDs is spreading globally with extraordinary rapidity. The evolution of the US food supply and its health impact offers a cautionary tale for the many countries to which these patterns of food commerce are now being exported. It is prudent to act early to preserve traditional food supplies, promote healthy local foods, and prevent junk food and beverages and other ultraprocessed products from becoming ubiquitous. The legal authority over food that has traditionally been used to address infectious disease must now also be used to prevent today's diet-related noncommunicable disease problems, creating food safety systems appropriate to the demands of the 21st century.[45] That effort is advancing slowly in the US. Marketing, retail practices, portion size and information to consumers must be addressed, as well as the determinations of what is allowed inside the product, to create a food supply that is not only healthy, but also sustainable and minimizes its contribution to climate change. It is likely that to meet the goal of ensuring healthy food supply, we will need tools of similar strength to the groundbreaking Framework Convention for Tobacco Control (FCTC). The creation of a Global Framework Convention for a Healthy Diet is one important idea under discussion globally to advance these efforts in an increasingly globalized world. [46]

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Health and freedom in the era of chronic diseases

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Health and freedom in the era of chronic diseases

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I

One of Sen's contributions to modern thinking about health phenomena is to discuss them based on the concept of freedom, which establish an important counterpoint to the utilitarian concept of wellness, propagated by international institutions in the post-war and still very popular today. For Sen, health has to do with the amplitude of effective opportunities of choice that people have to achieve the goals they value. Diseases and disabilities represent states of deprivation of freedom. If a person earns high income, but suffers from a chronic illness or a severe physical disability, there is no reason to consider her privileged taking into account only this aspect, since she may face considerable difficulties to live the way she considers most appropriate.

Sen uses the classic concept of deprivation in very broad sense to include not only the adverse health conditions as well as the lack of social conditions related to gender, labor and human rights. For this reason, he believes that the social and economic development, when driven by democratic means, usually culminates in a significant expansion of freedom and concomitant improvement of health equity conditions (Sen, 2000).

Sen's theses apply well to control policies of communicable diseases and the improvement of living conditions of persons with disabilities, as they make more clear the purpose of justice that health policies should have: to increase substantially personal freedom. One may wonder, howe-

ver, whether it contributes in a relevant way for the understanding of the vulnerability conditions of people with chronic diseases, as this essay intends to discuss.

It is evident that freedom is hindered by smoking and alcoholism, in the same way is hampered in the compulsive behavior in relation to food, which may lead to both obesity and nutritional deficiency, as occurs respectively in binge eating and anorexia nervosa. The same can be said of the frequent use of chemical substances, illegal or not.

What does Sen has to say about these habits, which, because of a lack of a well-founded philosophical concept, can be called addictive behaviors? In a lecture about health equity, Sen (2002) argues that the achievements in the field of personal health are a good indicator of the subjacent human capacities, because we tend to give priority to health when we have appropriate opportunities to do so. Then he mentions smoking as an example of lack of freedom (unfreedom), which results from psychological influences. This is a very unique and worthy observation, because in his works, including the culminant *The Idea of Justice* (Sen, 2009), the psychological issues that are behind people's choices are not examined. The observation is made superficially and it is not clear how he conceives the lack of freedom peculiar to smoking and other addictive behaviors.

For purposes of this essay, we assume that the mentioned psychological influences cover the states of anxiety, depression and stress and we admit that addictive behaviors can be analyzed as deprivation of liberty, just as sickness and disability.

Sen's theory of justice exemplifies a historically perfectionist conception of freedom. In contrast, Kierkegaard, Tillich and Heidegger consider freedom an ontological property that characterizes the finitude or the imperfection of human beings, an interpretation we adopt in this paper according to the following general terms: freedom is intrinsically ambiguous or problematic because, on the one hand, if that is what distinguishes health as such, on the other, it is the source from which emanate the dangers of chronic illness and addictive behaviors.

II

All of us who went through the experience of alcohol consumption and smoking habits know well that they are intensified at times when we experience great difficulties to deal with feelings of anxiety or depression and stress. The reasons may be linked to love relationships, work and the phases characterized by emotional insecurity, such as youth. Numerous epidemiological studies provide evidence in this regard. However, no empirical research can respond the following fundamental question What does freedom has to do with anxiety, depression and stress?

Contemporary psychiatry, a discipline that aspires the status of science, tries to keep clear of such philosophic question. More than anything, psychiatrists propose to describe, diagnose and treat increasingly by pharmacological means, mental disorders. The best known is the classification of the American Psychiatric Association (2013), which is in its fifth edition (DSM-5). The introduction to the DSM-5 manual explains that anxiety and depression are common to multiple diagnostic categories and may reflect a vulnerability that underlies an even broader group of disorders. Anxiety disorders are identified as a general category covering on one side, fear, understood as the feeling of an immediate threat, and on the other, anxiety, considered as the anticipation of a future threat.

Psychoanalytic theories, instead, always had much to say about freedom, beginning with Freud. In a remarkably philosophical essay about the constant dissatisfaction or discomfort characteristic of modernity, Freud says to be convinced, from his clinical experience, that freedom and happiness are unattainable conditions due to deep restrictions imposed by society to free expression of polar principles of pleasure and death (Freud, 1980). The failure to repress these two basic impulses is something that has become impossible under civilized conditions. To be able to support life, which is difficult and imposes us enormous tasks and frequent disappointments, we resort to palliative measures that allow us to find light in our misfortune, getting surrogate satisfactions of happiness. Freud is quite condescending to the various attenuating applicable to our inherent lack of freedom and happiness, even regarding the use of toxic substances, which he says make us insensitive to many of these problems. In this con-

text, he emits the known and ironic comment that apparently happiness was not part of the designs of creation.

Freud's comment ignores an important philosophical fact. Since Augustine (1995), Christian theology understands that God made human beings destined to happiness and freedom, as inferred from the biblical narrative of the original sin, and that, to grant him the powers of free will and desire, let him freely lean to good or evil. The concepts of freedom (*libero arbitrio*) and will (*volontas*) represent an Augustine innovation not only in relation to the thought of Plato, his main philosophical inspiration, but also in relation to the Aristotelian doctrine, as highlighted by MacIntyre (1988).

The pioneer of existentialism, Kierkegaard, radicalized Augustine's position when he introduced the notion that freedom is inseparable from anxiety (1979). In other words, freedom does not provide security or certainty about the fate of each person; on the contrary, all crucial decisions that the exercise of freedom refers to are accompanied by anxiety or even despair, but this is the real privilege of human beings towards animals. The anguish of choices is the inescapable path for those looking for the authenticity of religious choice. For Kierkegaard, anxiety is precisely what allows us to go beyond the merely ethical-philosophical apprehension of the harm problematic, as found in Hegel, towards the religious self-consciousness, by which we assume existential responsibility in the face of the reality of evil, which we face daily.

III

Inspired by existentialist revolt of Kierkegaard, the psychoanalyst and Protestant theologian Tillich (1980, 1984) understood that freedom imposes itself always as a distressing weight from which people try to escape. The distress or anxiety has undefined significance because, unlike fear, it is not referred to a given object. It is the human being, pursued by anxiety, which feels compelled to create behavior patterns that deep inside express his resignation to freedom. Recovering certain elements of the doctrine of stoicism, Tillich indicated that over the psychoanalytic process

or pastoral counseling, it is necessary to convert the states of anxiety in fear so that the individual rests on courage and can master them constructively.

Tillich defined anxiety as the existential awareness of the possibility of not being; therefore, not as an abstract knowledge, but as an apprehension of not being as a member of our own being. Anxiety is the certainty of human finitude, experienced as such by the awareness of our inevitable death.

The concept of the courage to be corresponds in Augustinian terms to the exercise of will in its intimate relationship with freedom. It should be noted, however, that anxiety states still preserve the possibility of affection, which does not happen with depression, a subject that Tillich does not address, perhaps because, in the 1950s, had not yet been consecrated as the great psychological problem then, as happens now.

In a historical-philosophical rather detailed study, the Brazilian psychoanalyst Coser (2003) says that patients themselves often consider depression as a kind of zero degree of desire. That is, depression expresses the absence of desire, as if the capacity to desire anything had left the person. Depression signals a lowering of the drive, in the psychoanalytic sense, and it is not possible to identify why. That is, the patient cannot identify a reason to be depressed. Here there is a notable lack of object, situation similar to anxiety, but opposite to the state of mourning, in which the affective loss is identifiable. The individual is in a condition defined by "lack of interest", as Freud said, who still uses the classic denomination of melancholy and correlates it with mourning. If in mourning is the world that disappears as an object of desire, i.e., of interest, in depression, it is the ego itself that empties and experiences an extraordinary decrease of self-esteem and the ability to love or to feel empathy.

Therefore, a person with depression cannot find in herself the affections necessary to enforce her will. What Tillich said about anxiety does not apply to depression, because in this case certainly it is much more difficult to achieve the courage to be, as activation or recovery of the will, and hence the own personal sense of freedom. The depressed person tends to live daily in an automated way, since she does not feel able to make important choices based on self-esteem and an affection whatsoever.

IV

The concept of freedom in Heidegger is essentially different from the existentialist theories, because it is taken as the foundation of the space--time relationship with the world. For Heidegger, freedom is the ontological precondition of apprehension of each entity – permit to understand the table as a table, a chair as chair. The human being is always demanded by the being (simply, everything it is) and responds according to the foundation of its liberty. For example, when he understands that what is in front of him is a chair, he sits on it.

The human existence as Dasein, its key concept, has a former tactical character, because it protrudes beyond itself, in the double dimension of time and space. For example, if we know that tomorrow is a holiday, we behave today according to this expectation. In *Being and Time*, the most widely read work of all his bibliography, which has about 100 volumes, Heidegger (2005, p. 247) says that anxiety is a feeling or imminent emotional disposition of Dasein. However, a disposition is not something that we have, such as a wristwatch; rather, it is disposition that has us in its own way to predispose or indispose. Anxiety does not anguish regarding a possibility of being present or future, is not about being anxious about this or that. It appears as an always-indeterminate threat and in a way it refers to the more general possibility of Dasein, which is being in the world. What eagerly oppresses is not this or that thing: it is from such negativity that anxiety rises and firm itself in the middle of nothing. This nothing is the fact of being in the world, which, in itself, is overwhelming and oppressive, but anxiety can open up the possibility of overcoming the everyday mediocrity and therefore be the way to experience the authenticity of Dasein.

Although he did not identified with the existentialist theories, Heidegger (2001) adopts equally the assumption that freedom is a permanent source of insecurity, as exposed in Zollikon seminars. In these seminars, organized by the Swiss psychiatrist Boss, between 1959 and 1969, and presented to a select group of psychologists and psychiatrists, Heidegger says that freedom is involved in the hermeneutic circle that is founded on demands that are directed to the Dasein and answers given by its free

behavior. This circle involves the human entirely, "down to the last muscle fiber" (Heidegger, 2001, p. 232), and is presented as an unavoidable burden to be carried, something that medical science studies under the name of stress. Therefore, what makes the human being essentially vulnerable is the stress arising from the incessant exposure to the demands of the world. However, stress is essential for the human being, for that is what makes life more intense, enjoyable and worth living.

Since freedom is not based on anything and, so to speak, stands on the abyss of this absence, the human being is always likely to get lost, not to take care of himself, to try to handle the demands that the world imposes to the possibilities for his freedom. The temporal-spatial projection makes it a little adaptable to its social environment, the contrary to what happens to animals, which are unable, for example, to create expectations about the future. Because they limit themselves to respond to immediate stimulus, animals can be considered better adapted to their environment.

Carrying the burden of freedom, the human being is essentially in need of help, because he is always about to get lost. According to Heidegger, the man lacks firmness, which is a result from its abysmal freedom, and that is the reason why there is the risk of failing to cope with the demands of the world, what may cause physical or mental illness, a peculiar distinction to modern medicine he sought to overcome through the key concept of Dasein. The disease is the limitation and disturbance of the possibilities of living freely in everyday life, since it is a lasting and perturbed existential closure. Besides, there is another danger that constantly surrounds the human existence: to get lost in addictive behaviors.

A phenomenological extension of this interpretation is to consider that, paradoxically, sickness, with its lasting existential closure, gives the possibility of better dealing with freedom, now less demanding, although it should be considered that there is a price to be paid, suffering. Similarly, dependency habits can be understood as more or less manageable forms of closure related to freedom, but distinguished by pleasure, which, however, is far from guaranteeing the absence of mental suffering. Thus, for a conception inspired by Heidegger, existential closure can occur either as chronic illness, as in the form of what may be called summoning, corresponding to addictive behaviors.

V

Heidegger says that all diseases should be interpreted as a private closing of freedom, which is, at the same time, an open-world adjustment disorder. The human being is essentially in need of help. By whom? Primarily, of whom is around him, since he is a being-with-others, but otherwise, by the medicine and any other kind of help, lay or religious, without restriction and exclusivity.

Heidegger adds that the decisive is not seek to provide aid through the search for a "functioning", as usually clinical medicine and psychiatry do. Aid should be conceived as a support to let the other be, leading to the possible adjustment to each one: those who want to help must learn to step back and let the other human being be. However, this means giving support so each person can largely face again its freedom and its inherent dangers, including any occasional feelings of anxiety, depression and stress, arising from our freedom itself. Security guarantees cannot be given when freedom needs to be affirmed and recovered in the healing process.

Going deeper on Heidegger's interpretation, it can be said that freedom brings a kind of suffering that is particular of our finitude. This is something that can be called background existential suffering, because it relates to the lack of firmness originated of our essence, projected in time--space. We are healthy when we are continually dealing with this suffering mode, based on the help of others, and yet we go through critical moments, when feelings of anxiety or depression take over. The background existential suffering is infinitely variable in its expression, also because it tends to be rejected and covered by the continuous unfolding of occupations and personal relationships.

The philosophical assumption adopted by Heidegger is that there is not, in sickness, any feature that is not present in the health condition. In the book he wrote over the period of the Zollikon seminars, Boss (1983) stresses that a person with schizophrenia has no behavioral trait that is not identifiable among healthy people. What lacks is the ability to coordinate his responses and attitudes, being self-confident, free, open and persistent in any situation.

The disease is always a closing characterized by long-lasting and profound disturbance of the relationship with the world. Therefore, it does not have the transitional closing aspect that is required for someone to focus body and soul in performing a difficult task (how to write an academic thesis), during which he feels anxious at various times. In this case, as soon as the task is done, the healthy person reopens to the world and resumes his daily routine, something that is impossible in conditions of anxiety as illness. However, even so, after leaving behind the demanding task to which was obligated for a long time, that person may experience a certain existential emptiness, i.e., a feeling of depression due to discharge, according to Heidegger. From the lessons of Heidegger, one could consider that anxiety is a basic feeling of the human being, while stress and depression are not actual feelings, but different ways of proprioceptive sensation related to putting up with the burden of everyday freedom.

Heidegger's analysis leads to the conclusion that the feeling of anxiety and depression are peculiar to the healthy individual and differ from their pathological forms only by temporal extent and radical nature of the disorder. Pathological forms have been well analyzed by Boss in his book on the existential fundamentals of psychotherapy. Boss took as an exemplar case a patient who had faced various stages of anxiety and depression, after breaking up with a sexually frustrating marriage. The difficulties for that person came to an apex when she suffered a sudden paralysis of the lower limbs, which occurred just when she saw the man of her dreams. However, through the process of existential therapy, the patient regained her capacity of joy and could establish a healthy emotional relationship with this man.

The most important interpretive elements that are inferred from Heidegger comments about this case are as follows.

1) There is no causal relationship between people. Nobody affects anyone to cause an anxiety attack with hysterical conversion (according to Freudian terms), as in the case of this patient. When she was anxious, the man's presence served as a reason for illness closure and she suddenly became paralyzed. In another time, this same man served as the reason for his cheerful reopening to the world;

2) The chances of an anxiety crisis for that person were already being cultivated by the patient and manifested dramatically with the paralysis of the lower limbs. Similarly, the "let it be" of existential psychotherapy led to the resumption of her joy and the possibilities of a new love relationship. To win her closure condition dominated by anxiety and depression, at different times, the patient had to decide whether to reopen her relationship with the world. This reopening could be sustained by the feeling of joy that came when she herself emotionally matured and became free to this loving relationship.

The analysis of this exemplar case shows that the reopening of the patient to the world placed her in a better condition to take advantage of the possibilities for her freedom compared to the period before her illness. Therefore, it can be considered that she gained freedom. This is another of the ambiguities of freedom and one more reason not to demonize the disease condition, as well as any other form of existential closure, including addictive behaviors.

VI

In sickness and in health, the human being needs help, but always as a response to reasons that are apprehended based on cultivable feelings. Therefore, the aid can never lead to the search for a "make it work" according to pre-defined patterns, but should let the other be in accordance with the possibilities of his emotional maturity. The success of healing depends on being free to certain possibilities of freedom by those that are being helped, because no one can "produce" the health of others.

It is now clear the great contrast that can be established between the age of communicable diseases and the current era of chronic diseases. While for that one illness could still be presented as something that affects us from the outside, now we ourselves who are on focus. From this existential contingency, we cannot escape, because, actually, we were always in it, but did not we noticed it.

However, it is a mistake to believe that, to bypass the risks of chronic diseases, it all depends on following a correct behavior as prescribed and demanded by certain public policies or social vogue of the search for a perfect health. In this sense, the motto of health as a responsibility of each one is of incredible cruelty. For no other reason, Illich (1990) said that, when facing this kind of slogan, the concept of health loses its philosophical meaning and turns into an inhuman standard. What accountability policies regarding risk factors seem to ignore is that the fact here questioned that man is condemned to its freedom and that freedom is an inexhaustible source of insecurity and need for help, so that each one can take care of oneself and not get lost in chronic illness.

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Luis David Castiel

Health promotion based on enhancement technologies: Appointments on the search of the most eternal possible vitality

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Health promotion based on enhancement technologies:

Appointments on the search of the most eternal possible vitality

Luis David Castiel

Introduction

First, it is worth clarifying that the use of the expression appointments in the subtitle can be considered in its two meanings found in Brazilian dictionaries. Can refer to either "summary, note or record of what was read, heard, seen, thought and/or felt, and that serves or not for a particular purpose" as "the act or effect of pointing, to make sharp, to emphasize the point of (something)" (Houaiss, 2009, p. 257). In addition, figurative readings fit here: the record is in the form of discussion of topics in pursuit of understanding the context that surrounds the scope of research and health care practices. At the same time, it has the pretension to present argumentative sharpness in his rhetorical style.

Also, please note the familiar metaphor of the tip of the iceberg regarding the partial knowledge we have of objects and things around us as to what lies below the water, supposedly beyond the reach of our sight and understanding. Therefore, the idea is to speculate on the submerged part of several icebergs that increasingly appear to be part of this "futurized" present with its enigmas (explicit or not) as symptoms in the health field. The very notion of preemption, as we shall see, would be a strong indicator of the situation.

Feinmann can summarize the premises of this approach (2008, p. 20) by pointing out that "the reality (its "construction" as "truth") is in the hands of power: the order power constantly imposes to the subject: truths, styles, fashions, phrases, images that the subject passively absorb". The production of scientific truth has problems "because science lacks self-reflection [...], lacks contextualizing with history and politics" (Ibid., p. 40).

These conditions reflect a triumphalist view of science, free of extraneous influences that can distort its findings that have the status of evidence, since they were produced by categories operated by rules, procedures elaborated with quality control that supposedly guarantee the truth status to ensure the accuracy of the findings. In turn, this proposition should morally model healthy behavior of individuals who have a personal obligation to take care of themselves with dedication, as part of a securitarian culture. However, several stimuli that conspire against it will remain working. This inevitably reflects ambivalent situations. Several consumption possibilities of agents potentially harmful to safety/health in terms of eating habits, including tobacco and alcohol, despite restrictions, for example, will remain affordable and, worse, tempting. And to discuss and to try to focus on the sources of stress in labor and urban life is not considered; at best, there are indications of how to manage stress that must be done, as a rule, individually, when they are not determined as activities as part of the workplace environment.

These issues are closely associated with ethical dimensions. For Bauman and Donskis (2013, p. 11),

> Everything is permeated by ambivalence. There is no longer an unequivocal social situation, in the same way that there are no inflexible actors on the stage of history. Trying to interpret this world in terms of categories such as good and evil, from the political and social perspective of black or white and of almost Manichaeism separations, today is both impossible and grotesque. This is a world that has long ceased to control itself (although seeks obsessively to control individuals), which cannot answer its own dilemmas or reduce tensions that it planted.

It is worth mentioning that such ambivalence has ties to cynicism, thought mainly as dual regulatory frameworks that enable the simultaneous convergence of two normative rationality, which, although contradictory, are combined in an integrated manner.

Here, we intend to address the issues surrounding the proposals for self-care in health promotion and that bring as focus the self-control formula, especially in the field of alimentary health to prevent weight gain and moderate the ingestion of foods that do not follow the ideals of healthy eating. Such propositions are presented as strategies of self-care, consecrated and naturalized in the field of public health and prevention in general.

Apparently, in a schematic way, it seems to prevail within these conceptions a dualistic perspective of a possible appeal to a sound mind who is guided by rational analysis of human existence. These analyzes take part on the domestication of potentially insane bodies with their harmful impulses before the possibilities of pleasure offered by modern life. The prize for that effort would be to achieve the greatest longevity (with vitality) possible.

It is necessary to say that this occurs within the neoliberal global capitalism with its canons on freedom of choice, the right to decide and the propositions supported by methodological individualism. This perspective of understanding social reality believes that social phenomena are best explained by the characteristics of individuals that are part of the phenomenon. That is, any analysis that involves sociological explanations in the macro context should consider, a priori, the micro context of individuals and their actions.

In other words, the model is configured from the autonomous and responsible subject able to establish relations of cost/benefit (but which could also be of gain/harm) in his actions and changes with the world in which he lives. Thus, individuals would be capable to choose what would be best suited to their needs and demands due to their ability to act effectively, once aware of their actions as consumer agents in a market that offers multiple options to consumers.

However, the adverse effects of this model – which are not few, nor trivial – often involve dealing with the hard side of precarization and

human suffering of excluded groups. One way to deal with these undesirable side effects is through the pathologizing of malaise. Eventually, the individuals who cannot deal properly with life dynamics established socially, which do not assume explicitly their moralist feature, especially in health, should be held responsible.

It is only possible to rationalize when there are crises of legitimacy in terms of the paradoxes produced by an economic growth and developing model of the new spirit of contemporary global capitalism (Safatle, 2008) and its model of unlimited accumulation of capital by formally peaceful means (Boltanski; Chiapello, 2009).

This "new spirit of capitalism" is at the mercy of a generalized form of cynicism configured by the presence of dual regulatory frameworks (Zizek, 1992), producing a plethora of everyday life situations in which events happen sharply marked by the sense of ambiguity. That is, the embodiment at the same time of two regulatory rationales, which, although contradictory, combine in an integrated manner. On the one hand, establishing rules for forms of social interaction and symbolic goals of self-regulation (as to the standards, aiming a population management perspective) and, on the other, by behavioral imperatives that go beyond attempts to establish boundaries in the face of demands of unlimited satisfaction (aimed at individual enjoyment without restrictions).

Managing the individualistic health of populations

According to Foucault (2001), population management should be conceived as a social body taking into consideration the description of what the processes of interest would be, represented especially by rates of birth and death, length of life, wealth production and circulation. The totality of the concrete life processes in a population is the purpose of security technologies, targeting mass phenomena of population to, in theory, prevent or compensate for the dangers and risks that result from the presence of the population as a biological entity. The instruments used here are regulation and control, rather than discipline and oversight (Zizek, 1992).

The objects of biopolitics are not humans in their singularity, but its measured and aggregated biological markers at the level of populations. This device makes it possible to establish rules, set standards and determine average values. Life becomes an independent element, objective and measurable, besides constituting a practical and epistemological reality apart from concrete living beings and the peculiarities of individual experience. The notion of biopolitics is related to the emergence of disciplines such as statistics, demography, epidemiology and biology. All of them allow analyzing vital processes in the population and governing individuals and groups to developing correction, exclusion, standardization, discipline, therapy and optimization (Lemke, 2011).

The fear of taking risks and the transformation of security constitute the main virtues of society. This fueled an inclination to exaggerate the problems that society faces, generating a hyper preventive and overanxious context. This context reflects in life, which emphasizes high awareness of the risk; predisposition to panic; fear of the stranger; susceptibility to abuse/abusers; concern to control individuals that are haywire, relapse, who are negligent in a context of fragilization of trust relationships (Ibid.). As if there were a way of life compatible with the paradoxical demands of capitalism, which require a pedagogy to guide people how to move with effectiveness in a context in which paradoxes, contradictions and ambivalences manifest.

Moreover, there would have been a counterrevolution in the years 1980/90 – a product of traditional conservative morality and neo-moralism of political correctness. In turn, there is a reduction in questioning the assumptions of the relations of domination. We then have another turn of political correctness in health in terms of regulation of conduct by risk – a moral technology (Lupton, 1999) that participates in this health neo-morality, which is supported by scientific imperatives of empiricists' evidence, especially of epidemiology, and by ethical reasons about what is good and bad in terms of the relationship of each person with its health, in terms of self-care.

Both intend to give a narrative sense to individualism, but eventually isolate and alienate individuals in generating their subjectivities and identities. In brief terms, the assumptions about the possible origins of the

political correctness are located in movements supposedly of the US academic intellectual Left of the 1980s against discrimination of traditional morality, allegedly of Marxist inspiration and of the Frankfurt School. In this context of time and place, a considerable moral vocabulary adequate to the task of fighting prejudice through cultural criticism developed. Some of the new terms name morally troubling systems of domination: for example, racism, sexism, classism, heterosexism and colonialism.

The success of neo-moralism is because it is directed to the atomized individual and it seeks to give sense to his experience of isolation alienated of contemporary individualism through individualistic narrative focused on the management of oneself. At the same time, neo-moralism tries to reduce the excesses of capitalism based on consumption and blends with traditional moralizing elements, as many of them are consistent with corresponding conservative principles such as security idolatry, emphasis on restraint and moderation, based on the precautionary principle, outlined by philosophers of the nineteenth and twentieth centuries (Furedi, 2006).

This new manifestation of individualism followed deregulation in the 1980s, in order to reduce State intervention to not hinder the capital flows in global markets and stock exchanges: privatization of state enterprises; loosening of fixed employment contracts; increased supply of short-term jobs, low-paid in service sectors; loss of social security benefits; replacement of operational professionals by computer software; expulsion of active individuals for long-term unemployment, retirement or even delinquency (Türcke, 2010).

The social phenomenon translated into the precautionary principle has led equally to the development of a philosophy of care, built on a history of prudence, which reveals, at first, the dominance of the responsibility paradigm. A healthy lifestyle overall demand prevention. Even abstinence modalities can be considered as supposedly responsible defense from standards and rules against potential vices/additions caused by modern life consumption.

In the field of health individualism, individuals are constantly focused on issues related to their own ontological security and are compelled to follow self-care recommendations, adopt virtuous healthy behaviors, consuming products and preventive arrangements as a formula

for the desired long-lived vitality, minimizing malaise manifestations from precarious aspects of current lifestyles. Finally, to conclude, it is important to emphasize that there is a reason in seeking to speak the truth in terms of parrésia, even if it is not based on empirical evidence. For these, as we have seen, occupy a position of indifference as to its responsibilities in terms of the moral implications of the dynamics of its social use.

In fact, we have a task in the moral sphere, namely, acting in pursuit of other ethical and political commitments that deviate from the utilitarian perspective of the supposedly autonomous and rational agents, with the right to decide and choose their own benefits before the stipulated costs – only within possibilities greatly reduced and estranged from emancipatory dimensions. In this sense, it appears as a contribution to address the dynamics of power relations in society, which model the relationships that arise in the context of personal and collective health practices that interact with the subjective dimensions of individuals.

There is a need for critical analysis of the oppressors modes produced by cynical rationality that naturalize and sustain the demand for addressing the subjective modes of subjection. It appears, for example, in the use of healthy food seals of approval by scientific societies in many processed foods."Health care, through these paths, is reduced to an ideal of freedom from disease, food treated for disease avoidance and human life subject to standards set by technical experts" (Villagelim et al., 2012). Thus, it legitimizes and regulates food as medicine in a cynically institutionalized way by experts. It is important to pay attention to games of interest and power and resist the moralistic treatment of health risks through restrictive normativity of promoting healthy food as an exaggerated idea of sociocultural weight control.

Enhancement technologies

This text is about enhancement technologies (HETs) and its function of mainly selling the possibility (real or virtual) to maintain and provide both youthful appearance and longevity with vitality to humans. Firstly, it is important to define our way of addressing this theme. For this,

we must refer to the bioethicist Elliott (2003) in its consideration of these technologies illustrated by issues related to the prosaic man's cane. Does it becomes, in a sense, part of the blind person? Yes or no? If so, how? The attempt to produce answers to these questions can generate perplexity, because it will inevitably depend on what we mean by that person. If by person we mean human body, the answer will have to characterize whether the cane is seen as a body extension or a kind of prosthesis with an important orientation role in a predominantly organized world for the huge majority that can see.

However, if person (we could think of the notion of subject, but it is not our intention to address psychoanalytic considerations) implies any idea that can try to decipher the question "Who am I?" through identity approaches, we can assume that one of these ideas would be via the construction of an idea of self. So, in brief terms, one way to formulate the question may signal that in the late-modern Western world the idea of oneself can be explained by not overlapping exactly the ideas of body, mind and even spirit (it is not worth mentioning here where this issue can lead us), but it is linked to all of these ideas.

According to Elliott (2003), the notion of yourself, besides other aspects, constitutes a moral concept, a nuclear place where feelings like pride and shame manifest. Despite the possible controversies of this explanation, it serves to set that the expression 'enhancement technologies' indicates the possibility that it appears to be morally important for such technologies the fact that they are allegedly used to "self-improvement".

However, this is unsatisfactory in analytical terms. Discussing what would be self-improvement seems to distract us from essential issues. The focus here is the need for improvement to people, because it affects something crucial for vectors that act on repeated construction, always incomplete, of their notions of themselves. As Elliott says, when preferring to deal with the idea of self than of self-improvement to think about the enhancement technologies, it is: "[...] because our ambivalence about many HETs is often an ambivalence about the types of people we want to be. The question is not whether there is any moral cost in the pursuit of becoming better, but if there is any moral cost in the pursuit of becoming different" (Ibid., p. 27).

To Crawford (2006), in a culture that gives so much value to health, people are defined, in part, by the success or failure to commit to healthy behaviors. This links to alleged character and virtue structures to which is attributed the ability to sustain such behaviors. The ways usually considered to obtain health and the conditions considered salutary are predicates that configure the idea of oneself and become building blocks of modern identity, acting in the moral field of modern societies.

On the other hand, Bauman (2005) expands the treatment of this issue, indicating that some people can choose how to build their identity, but some people do not, as in the plot of Elysium, because the possibility to choose also constitutes a powerful element in social stratification. At one end of these processes, are located those that can establish and abolish their identities, according to what they wish on a broad menu of options. At the other end, are those who had refused access to the possibility of choice and consumption through their identities, since they do not meet the socio-economic requirements for this benefit. Their identities are defined elsewhere, determined by others. "[...] – Identities that they themselves resent, but are not allowed to leave neither of which can get rid of. Identities that stereotype, humiliate, dehumanize, stigmatize [...]" (Ibid., p. 44).

The promotion of expanded health

The expression "promotion of expanded health" intentionally plays with an ambiguity of meaning. On the one hand, it serves to designate the health promotion strategies – based mainly to avoid risks and form a corresponding identity, usually based on the "Holy Trinity": diet, physical activity and avoiding tobacco use (Nettleton, 1997). These recommendations were legitimated, established, widespread and currently adopted (at least partially or considered as an issue) by large groups of people globally. In addition, they are supported by a progressive expansion of a sense of hyper prevention in health through medical, epidemiological, communication/media speeches in the last three decades (Castiel; Sanz-Valero; Vasconcelos-Silva, 2011). One of the clearest emblems of this expansion

can be seen in the widespread increase in public restrictions on smoking practices and in the divulged expansion of health and longevity conditions for those who can follow sustainably the ideas of self-care in health.

On the other hand, the idea of expansion is related to a photographic metaphor of magnifying images to highlight and notice details that escape the usual dimensions in photographic development. In this case, it means moving out of the scope of the evidence of dominant enunciation and trying to understand the evidence of its possible political and ideological joints.

Broom (2008) points to the unintended consequences of primary prevention project. Undeniably, such a project can be described favorably, with good prospects in establishing its cost/benefit or effectiveness. In the case of a critical perspective, we will discuss briefly four questionable features of this project:

- Its focus on the individual and the corresponding behavioral risk factors. Even when it generates positive effects, there are three issues: blaming the victim, that failure to adopt a healthy lifestyle (and reach the right measures); erasing structural factors – political, urban, socio-economic, ethnic and gender differences –; intensifying compulsive surveillance: the responsibility to be constantly alert to yourself and others – about the "Holy Trinity" already mentioned: what to eat, exercising routinely, avoid smoking, etc. As Broom says,

  > [...] the default option of the individual as the author of its own destiny is constantly restored. A comprehensive public policy interested in practical interventions and 'modifiable' factors becomes a self-fulfilling prophecy; we bring it into play and, in the end, only investigate and act on factors that have been defined as modifiable. Elements of policy, culture and social structure are seen as being outside the scope of public policy or disappear or are presented in a sentence or two (2008, p. 131).

- The evidence-based perspective: there are limitations to reach guaranteed protocols by employing meta-analysis and systematic reviews used in clinical and hospital settings to community context (the focus is individualistic). In addition, there are studies that

show the bias power of pharmaceutical corporations to generate alleged evidence for the efficacy of new drugs produced (Dumit, 2012; Elliott, 2010);

- The practice of medicalization or, more specifically, preventive therapeuticalization: for example, obesity, sedentary lifestyle, prediabetes, prehypertension and hypercholesterolemia as risk situations that usually require treatment;
- Links with neoliberalism, the commodification and consumerism: the valuation of the individual is a central element in sustainable neo-liberalism; the redefinition of the citizen as a consumer and the ascendancy of privatization and commodification have created circumstances in which health problems (and its prevention) become issues surrounding market defined by power corporations, biotechnology, pharmaceuticals and HETs, etc. "Paradoxically, the convergence of commercialization and individualism may have the effect of allowing the appropriation of the discourse of individual rights by private biotechnology and pharmaceutical corporations who are quite ready to put human rights on the market" (Broom, 2008, p. 134) .

There is also the matter of health promotion/prevention having to review collective benefits against the risks of individuals. What are the justifications to intervene collectively to protect people who are not also at risk (and may not want to be protected)? The health prevention/promotion closes a matter of apparent consent (implicitly) massively informed, based on risks and choices of adopting self-care measures (Dumit, 2012).

In other words, decisions that require persuasion informed through massive recommendations capable of stimulating individuals, so that each one should self-care, self-control, not lose self-esteem and maintain self-confidence, even if not necessarily to benefit from current campaigns to reduce hypertension, heart disease, cancer, etc.

According to Crawford (2006), we must consider that there seems to be a conservative perspective in the field of health promotion and prevention: moral authorities recommend the fundamental importance of self-discipline. Moralism and survival arise in conjunction with this self-discipline; a discipline to fulfill moral precepts and for the pursuit of self-

interest – chasing after your dream to become self-sufficient and successful according to the prevailing social values. For this, it is important to be good, that is, disciplined, avoiding or knowing how to deal with risky things, with temperance and a utilitarian managerial sense, evaluating life in terms of ends and means.

Therefore, individuals want to maintain their existence, facing the many demands of life by managing responsibly – at their own risk, fostering the possibility of minimizing the effects of aging and achieving longevity with vitality. Health is allegorically established in parallel with the cultural contradictions of capitalism: it consists of narratives and practices through which people struggle, seek to make sense to and strive to achieve a balance between conflicting imperatives: pleasure and moderation.

The anti-aging enhancement technologies

A typology of sciences/practices related to the aging control was proposed and adapted from Vincent (2007). In schematic terms, it is important to consider that there may be areas of overlap between the categories:

1) Cosmetics (symptoms relief) – a) cosmetic practices: Botox, plastic surgery, anti-wrinkle creams, etc.; b) prophylactic regimens: diet, exercise, healthy lifestyles; c) compensatory techniques: drugs for erectile dysfunction, growth hormone;
2) Medical (healing) – a) regenerative medicine: therapy with stem cells; b) clinical interventions for specific aging diseases (cancer, arthritis, heart disease); c) medical therapies based on change of lifestyle: diets and exercises directed to degenerative aging diseases;
3) Biological (prevention) – a) epidemiological research: populations of centenarians and genes; b) evolutionary modeling: discover and overcome the evolutionary limits of life duration; c) science of cellular processes and its respective aging; d) genomic science: mapping and gene sequencing to verify genetic processes responsible for aging, allowing the development of gene therapies that can slow, stop or reverse aging processes;

4) Immortalist (elimination) – redemptive goal of medicine for definitive improvement – achieve immortality: a) through substances and devices allegedly able to extend longevity, including cryogenic chambers; b) scientific programs for biological and/or cybernetic immortality.

Vincent (2007) considers that, in general, groups of professionals use war metaphors, declare a war against advanced age and show aging within a cultural perspective that sees it as a naturalized biological event that needs to be attacked and defeated. There are experts that: 1) claim their technical capacity to address such phenomena by proposing and practicing cosmetic interventions to remove and mitigate signs of aging in order to stigmatize it as undesirable and unpleasant; 2) turn advanced age into a disease and fight it; 3) propose to strategically meet cellular and molecular processes related to aging in order to expand lifetime limits; 4) intended to make immortality possible. Groups 1 and 4 employ more war allegories to describe its function, while groups 2 and 3 camouflage the paradox of the purpose of understanding the diseases of the elderly, supporting the goal of expanding life and, at the same time, avoid dealing with the moral dilemmas of that extension.

What each one of us is willing to do to live longer?

This question may seem simple and, in a way, it is, because it fails to consider, in brief terms, several important contextual elements that affect health beyond the access to available HETs and the importance of personal responsibility that currently prevails in the contexts of health promotion and longevity, where the focus is predominantly individual. However, even then, with these safeguards, we will continue, because this is the path that is presented to us from the perspective of the dominant personal responsibility for self-treatment in health.

It is important now to analyze the context of the formulation of the question and its authorship. It was formulated by Taubes (2011), a journalist specialized in science, in a commemorative text of the 30th anniversary of Discover magazine –which shows the categorical statement on

the cover that had passed 30 years that changed everything (1980-2010). Taubes was a writer in this journal during part of that period. Another story proposed a more general question to various exponents of the field of science and technology: "To where we go from here?".

Taubes is also known, among other things, by a book that criticizes diets (*Good Calories, Bad Calories: Fats, Carbs, and the Controversial Science of Diet and Health*, 2007) and an article entitled *Epidemiology faces its limits*, published by the prestigious journal Science in 1995. In the article, Taubes, co-author along with Charles Mann, already examined the main difficulties of epidemiological research to affirm, among other things, that the control of lifestyle and environmental factors justified the anxiety that the prescriptions of healthy self-care caused (Taubes; Mann, 1995).

Of course, since then, epidemiological studies give signals, due to the range of published studies, meta-analyzes and systematic reviews conducted, that they have accumulated *evidence* seeking to substantiate the relevance of a *healthy lifestyle* in *promoting* individual *health* (we here use the consecrated expressions in italics) even if an adverse effect of this is the expansion of moralistic speeches on health and also anxiety facing difficulties to follow and maintain the prescriptions of a healthy lifestyle.

Taubes (2011) focuses on the possibilities of increased longevity and asks about the goal of the three-digit age. More than that? Forever? Or maybe something more reasonable according to the outlook of our time: a possible feasibly life period (for those who have access to technological advances), according to the age group considered, depending on today's youth and thus of probably how to achieve such benefits as to longevity that would be forthcoming in a near future.

So, before you answer the question that opens this section, it is also necessary to imagine, symptomatically, in tune with utilitarian times, a possible imaginary analysis of "sacrifice-benefit" as to what you are willing to do to get extra years. Or, following an analogy with videogames, what to do to earn more "life".

Therefore, we must be willing to follow the preventive catechism of healthy lifestyles in terms of diet, weight control, exercise, moderate use of alcohol and safe sex practices, among others, trying whenever possible (or, if possible, always) to be guided by self-discipline/self-control. And, when

appropriate, using recommended drugs, for example, to control hypercholesterolemia or other existing panacea that promise longevity (such as resveratrol, coenzyme Q10 or sirtuin enzymes), even after their real effectiveness has been discussed in some studies (Taubes, 2011).

The longevity perspective

Several studies, works and authors are dedicated to this theme. Considering the purpose of an assay like this, it is not appropriate to make a systematic review or anything similar, but to go over a few things in search for elements that may even play the role of indications that perhaps may be configured as symptoms or manifestations of the spirit of our time.

Within the biological category of Vincent's HETs (2007), it is important to consider the question of decoding the genes responsible for longevity that would be inherited and their relationships with certain aspects of lifestyle, diet and what is often referred to as environment. There are studies on centenarians' clusters indicating that a large number of people would have groups of genes that serve for this purpose.

For example, in *The Longevity Genes Project* (2015) at the Albert Einstein College of Medicine, Dr. Nir Barzilai and his team conducted genetic research in more than 500 healthy elderly between 95 and 112 years and their children. According to the group's website, identification of longevity genes by researchers can lead to new treatments with drugs that can help people live longer, lead healthier lives and prevent or significantly delay disease related to aging, such as Alzheimer's disease, type 2 diabetes and cardiovascular disease.

By the way, Barzilai was interviewed for Taubes (2011) in the story previously reported and mentions that when the project began recruiting centenarians, they realized they had a family history of longevity. However, there was no evidence among them of the predominance of a healthy lifestyle: only 2% were vegetarians, no one exercised regularly and 30% were overweight or obese in the 1950s, when there was not a lot of people overweight or obese. Almost 30% had smoked two cigarettes packets for over 40 years.

However, after that, let's say, curiosity, soon we got the message that for us, others, smoking cigarettes will not stop killing us prematurely and not getting regular exercise will not make us live longer...

Another group studying centenarians, which started in 1995 – The New England Centenarian Study (2012) – describes their recent findings in studies published in 2012. Among others: a) many genes are involved in the centennial longevity; b) they found 281 genetic markers growing on prediction in terms of accuracy, respectively, 61%, 73% and 85% for centenarians of 100, 102 and 105 years, suggesting, according to researchers, that the genetic component of superlongevity becomes progressively higher among older people; these markers indicate at least 130 genes that act in Alzheimer's disease, diabetes, cancers, hypertension and biological mechanisms of aging; c) centenarians have genetic variants that are associated with high risk for the referred diseases, as for the population, but their survival advantage is due to the existence of genetic variants associated with longevity; d) people have genetic profiles based on these 281 markers (each having three variations, which are in turn associated with specific probabilities of achieving a very advanced age) (Sebastiani et al., 2012).

There is also the compression of morbidity theory in supercentenarians (over 110 years of age), which appears to have been tested in a sample of 100 supercentenarians, when it was possible to investigate that people who approach the limit of human survival (110-125 years) really compress their morbidity around the end of their lives (Andersen et al., 2002).

It is also important to consider the complex relationship between epigenetics and longevity, in which one must take into account the emergence of epigenetic influence on the discovery that genes do not handle causality in phylogenetic nor ontogenetic terms. Epigenetics is fast becoming a crucial dimension of aging and longevity. It is important to clearly define what is meant by epigenetic

> [...] The study of the mechanisms that lead to 'persistent' developmental changes in the activities of the genes and their effects, but that do not involve altered sequences of DNA bases. An important epigenetic component is the 'epigenetic inheritance', the transmission of phenotypic

> variation that is not from differences in the sequences of DNA bases from one generation of cells to the next (Jablonka; Lamm, 2011, p. 19).

Those who are centenarians retard epigenetic changes and could pass on this preservation capacity to their descendants, due to methylation processes (a form of epigenesis).

Of course, the message about extragenetic factors is repeated, especially those assigned to healthy lifestyles, which should slow the development of diseases related to aging and therefore change the health and the life duration of the population. To fully understand the desirable phenotypes of healthy aging and longevity, it seems to be necessary to examine the entire genome of large numbers of healthy older people to observe at the same time, both common alleles as rare ones, with careful stratification control and taking into account nongenetic factors such as the environment (or, in other words, what constitutes the context of life) (Fight Aging, 2013).

However, for Taubes (2011) it would be more reasonable, not the goal of centenary, but the goal that corresponds to the period of healthy life. More than suffering from heart disease or cancer at our 50s or 60s and therefore requiring expensive treatments and drugs to survive up to 75 years, "[...] we will age more slowly. We will still be affected by such chronic diseases, but 10 or 20 years later, shortening the time of hospitalization, nursing homes, home health care and the money that we and society as a whole have to spend on medical care" (p. 4). Taubes, without specifying, supports the utilitarian rationality of dominant cost-benefit for the goal of healthy aging – as long as possible. Apart from the differences, it is reasonable to think that we are in the theoretical perspective of compression of morbidity proposal for another 10 or 20 years ahead, mentioned previously in the discussion of genetic aspects of centenarity.

The Immortalist perspective

According to Hall (2003), you can see that in recent decades, medical science lined up to face the "problem" of aging (and its terrible side

effect, death) in a substantially different way in relation to any era of the history of medical interventions. Current efforts to extend life by medicine are impressive. Hyperbolically, doctors can, in certain circumstances, be designated as merchants of immortality.

Now we can cogitate that aging now exists as a separate phenomenon, degenerative, which, as one tries to know it better, naturally, we want to see if it is possible to fix the process and repel the laws of mortality. The civilization in the forms of preventive medicine, public health and hygiene, vaccination and other measures, including HETs, increased lifetime. It does not seem absurd to say that aging is an artifact of civilization.

At this point, the text goes through ways where we begin to live with the feeling that the scientific statute starts to unsettle facing futurological and marketing claims that arise. An illustration of this review can be assumed by the already known controversy about the scientific legitimacy of the practices called antiaging medicine.

Sometimes, we risk transiting through peculiar narratives, eventually focusing on elements that can border fantasy and/or caricature. Among the options available in the immortalist market, to assume this perspective, we chose to start with a hi-tech design, symptomatically called Avatar, by a Russian media entrepreneur – Dimitry Itskov, who offered in 2012 a kind of cybernetic immortality to billionaires who agree to have their brains transplanted to robots –, a scene with elements already marked by at least an exotic blend of entrepreneurship and science fiction with elements of farce, delirium and/or opportunism. The entrepreneur would have hired 30 scientists to make the project viable in ten years and sent letters offering the opportunity to participate as lenders to billionaires, according to Forbes magazine list (Daily Mail, 2014).

This perspective has affinity with another project, much more widespread and whose applicant enjoys a status possibly less conducive to incisive interpretations. We are talking about Raymond Kurzweil (RK) – American author, inventor, futurist, and currently, engineering director at Google company. It is difficult to synthesize information on RK. There are several portals, publications, inventions, videos, books, articles, multimedia, and blog. He is involved in fields such as optical character recognition, text synthesis to speech, text recognition technology and even electronic

keyboards. His books talk about health, futurology, artificial intelligence, technological singularity (a topic to which we will return) (Kurzweiltech, 2014).

Interestingly, in the context that interests us, RK is also a prolific author in the field of HETs directed to longevity before becoming an immortalist, according to Vincent classification (2007), cited previously. He wrote books on diet and nutrition. Among them, *The 10% Solution for a Healthy Life: How to Reduce Fat in Your Diet and Eliminate Virtually All Risk of Heart Disease* (Kurzweil, 1994), in which he argues that high levels of fat are the cause of many health problems in the United States and to cut the total calories consumed to 10% of current's level would be the best index for most people; *Fantastic Voyage: Live Long Enough to Live Forever* (Kurzweil; Grossman, 2004), co-authored with doctor Terry Grossman, describes discoveries in the areas of genomics, biotechnology and nanotechnology that can allow us to live longer; *Transcend: Nine Steps to Living Well Forever* (Kurzweil; Grossman, 2009), also co-authored with Grossman, features a development of the previous book, with a program based on thousands of scientific studies, which shows that advances in medicine and technology will allow us to extend our life expectancy and delay the aging process – in fact, there is a portal of both authors that sells products for this purpose (Ray and Terry's Longevity Products, 2014).

However, the immortalist proposal is in the book *The Singularity is Near: When Humans Transcend Biology* (Kurzweil, 2005), which was turned into a film that mixes documentary and fiction produced and co-directed by RK in 2010. The idea of uniqueness employed consists in a math metaphor to study space black holes, space-time region in which the known laws of physics cease to exist.

The technological singularity is a term coined by Vernon Vinge – mathematician and science fiction writer. It would be a future period (around 2045) during which the speed of technological change is so fast and its impact so profound that human life will be irreversibly transformed by concepts that we will trust to give new meaning to our lives, from business models to human life cycle, including death itself. We will have effective software models of human intelligence, able to combine the advantages of human intelligence (inference, creativity and imagination) with

the advantages of machine intelligence (memory, speed, accuracy, absence of tiredness).

We will be able to redo all the organs and systems in our biological bodies and brains to be vastly more capable. The so-called emotional intelligence will be expanded and controlled by nonbiological intelligence. Some of our emotional responses will be modulated by nonbiological intelligence to optimize our intelligence in the context of our fragile and limited biological bodies. As the virtual reality of the nervous system manifests in terms of resolution and reliability, our experiences will increasingly occur in virtual environments. In virtual reality, we can be a different person both physically and emotionally.

This process will continue until the nonbiological intelligence expands and reaches patterns of energy and matter for optimized computing – based on our understanding of computational physics. When we reach this limit, the intelligence of our civilization will continue expanding to the rest of the universe, until you reach the maximum speed at which information can move. Finally, the whole universe will be occupied with our intelligence. We will determine our own destiny and not the physical forces that govern the celestial mechanics. Of course, this is a very controversial proposal, which generated debates about its feasibility – viewable on the internet. However, there is no room nor is it our purpose to deepen this particular discussion.

Another emblematic immortalist character is the British gerontologist Aubrey de Grey, living in the USA. His enterprise also has several portals, text, video, etc. In fact, belongs to him, similarly to RK, the comment: personal marketing is the soul of business. Physically, either by coincidence or not, Grey's long beard make him look like a descendant of Methuselah. Actually, one of his portals is the Methuselah Foundation. There we have a summary of his proposal for regenerative medicine as "the future of health care, promising cures for everything from heart disease to diabetes, dramatically reducing costs and extending healthy life. But it needs public investment and coordination to mature" (Methuselah Foundation, 2015).

His idea of regenerative medicine is in another portal: called SENS Research Foundation. SENS is the acronym for Strategies for Engineered

Negligible Senescence. Next, is his formula to reach such an achievement, when dealing with the seven types of aging damage: cell loss or slow replacement of cells (Parkinson); cellular excess/senescence: cells that do not divide nor die, producing harmful secretions; accumulation of mutations in chromosomes causing cancer; mutations in mitochondria that can accelerate aging; indigestible molecules (cellular waste) produced by molecular processes within cells (atherosclerosis, neurodegenerative disease); indigestible molecules (extracellular junk): protein remains (Alzheimer's); accumulation of crosslinking extracellular protein: cells which are held together by new chemical bonds; when in excess, produce loss of elasticity (arteriosclerosis, presbyopia) (SENS Research Foundation, 2014). There is also, of course, on the internet, criticism to Grey's proposals, but is not our job to analyze these aspects.

Final comments

There are some possibilities of Foucault's analytic treatment to the issues presented. For example, to cogitate the biopolitics dimension of self-care and regulation based on governmentality manifesting in an enhanced form. However, it is also possible to move forward to aggregate and adapt Zizek's comment to indicate that the blurring of the boundaries between machine and organism is based on the fact that the dynamics of capitalism today would have overcome the logic of totalizing normality and adopted the logic the erratic excess (Zournazi; Massumi, 2002). The more diverse and more erratic, more convenient, since normality started to weaken and the regularities become less strict. This context is part of the capitalist logic of surplus value production. It is not about the institutional disciplinary power (sovereign) to establish the natural order of things. It is the power of global capitalism to produce goods and niche markets that has developed and proliferated in this way (Ibid.), but also at the same time it increased the precarious field for symbolic roads that existed to address human finitude, the market takes care to offer a coveted consumer object of desire: the added longevity to be afforded by HETs.

On the other hand, within the reflections on biopolitics technologies of prevention, preemptive is a term used in specific ways in Portuguese, but apparently there is greater amplitude in English, to even be considered a paradigm – preemptive paradigm (Diprose, 2008). In short, it is the intervention that occurs before the action could hinder plans or actions of that person that needs to anticipate the action of another and act-reacting to what is assumed he assumes to be detrimental – in short, a preemptive strike. It is a strategic concept on the military/competitive environment, considerably likely to be affected by adverse reactions that result from errors of judgment.

It is used, for example, in military aggressive strategies (the Iraq invasion, the preventive attack on the alleged weapons of mass destruction) or even in the marketing between competing companies/corporations. However, the verb preemption indicates, above all,"a priori appropriation of something, the right to purchase something before others, the government's right to appropriate something (as a property)" (One Look Dictionary Search, 2014). Preemption in Portuguese has equivalent terms: precedence in purchasing; advance purchase; in computer science: in a multitasking environment, an action or event that causes change when processing from one application to another (Houaiss, 2009).

There was also a specialized use in preemptive analgesia (but not only for preventive diagnostics/therapies using other drugs/interventions) in dentistry, medicine and veterinary medicine, meaning, in short, something like eliminating the problem before it arises or give evidence of that, nor giving a problem the opportunity to even arise. (Dejean et al, 2008; Liporaci-Junior, 2012). Undeniably, we are in the territory of anticipatory interventions, consistent with the scope of securitization of our time – a relatively trivial example: the morning-after pill, prevention of pregnancy due to unsafe sex.

Regarding the HETs of longevity and immortality, the two meanings are opportune, both preemption, as possible precedence of a few when accessing them over others, as preemptive, in war metaphors of preemptive strike on war on aging (Vincent, 2007).

One of the problems of this model is that, instead of facing a health-threatening event as part of the context, its occurrence is magnified as

standardized reference to threatening situations to health/safety of living populations. This idea is also extrapolated to economic security. If we add that to a perspective of fear management (or risks), this way of thinking leads to a dynamics of harm reduction policies (and aging as a damage) through technical control measures for health/security, aiming to protect the planet, nations, groups and individuals from the unpredictability of future – without a minimum and reasonably consensual diagnosis (if that is feasible) of what the present is (Diprose, 2008).

In other words, this impossibility of success of hyperprevention proposals (promotion, protection, prevention, precaution and preemption) aiming longevity is linked to the notion of future securitization, within a conception of a certain future imagined by the regulation of all aspects of modern life. In a way, it turns the present a hostage of an idea of future. How to know what the future holds, even when health futurologists ensure high relative probabilities to the scenarios they view (avoiding terms of high mythological content, as oracles and prophecies)?

Well, there will always be a lack of information and knowledge that will stop from overcoming the scenario of uncertainty and risk. It does not matter how detailed, accurate, and rigorous data collecting is, we cannot assume that it will have sufficient data, which risk calculations are satisfactory for future policies of risk management. We remain deciding on risks from elements that include suspicion, arbitrariness, precautionary excesses and preemptive abuses facing possible threats (Stockdale, 2013).

Baudrillard (2002) produces reflections on what he calls the reality murder and perfect crime, especially opportune in relation to Kurzweil's proposals. The reality murder means, for Baudrillard, a displacement of the origin, end, past and future, continuity and rationality. What we live is a virtual world in which the referent disappeared, the subject and its object. This current state was only possible thanks to a perfect crime, which is precisely the one that destroys not only the victim but also any evidence that the crime was committed. The sentence of this whole process is still quite enigmatic. Even if all paths point to the significant virtualization of the world or to its radical illusion caused by rampant technological development, one cannot draw a safe end.

Concerns about longevity and immortality are symptoms of primal fear of death as manifestations of the spirit of this time that serves the commodification of that fear. According to Bauman (2008), possible strategies for dealing with the knowledge of finitude are: building bridges between life and death through the promise of eternal life of the soul; daily staging the deaths of strangers (trivialization), loss of close people (with a range of affective bonds) and the metaphorical death by loving separation; shift the focus of attention for the surveillance and control of death causes (risk).

In addition to the non-rational formulas of heavenly life (by merit, through the immortal soul), stay for posterity (individual fame) could be achieved by heroic acts recognized as such. Now, there are moral tales indicating that technoscientific reason and the market may postpone suffering and death or even save us. The fragility of human bonds accentuates a lack of protection facing of death. Death is deconstructed, in tune with the spirit of modernity by factorization and constant vigilance in pursuit of integral risk prevention. This mission fails a priori before its limits – especially after emphasizing the perspective of individual responsibility and the dimension of unpredictability –; does not sound feasible nor possible to prevent every risk that can threaten us, perhaps not even most of them.

A final word about the HETs. It can be said that modern era began with the compulsory pursuit of happiness – with a status of right, duty and higher purpose for those who can afford it. We then have the pursuit of happiness as personal self-satisfaction in an exercise that links individualism and global capitalism. Markets change the dream of happiness as a state of satisfactory life to the endless search for the means to achieve a happy life that always seems to be ahead. The game for the pursuit of happiness is to run, not to get there.

In a society of consumers, we will be happy as long as the hope to be happy is not lost, but the pursuit of happiness is competitive. It is the paradox of a society that sets for all a standard that most cannot reach. Most people seek happiness where they cannot find it.

For Elliott (2003), the ultimate happiness is the human dream of permanence, infinite longevity, eternity of the human being. Suffering and unhappiness become problems of brain chemistry – self-satisfaction: indi-

vidual psychological well-being. It is life as a project of planning and managing life that maps, organize, choose and compare it with other projects in the pursuit of a happiness that demands individual responsibility. The HETs act as tools supposedly to produce a better design, more successful, long-lived and, if possible, immortal, according to the prevailing context of sustainable neoliberalism. The pursuit of happiness becomes a strange kind of duty that demands HETs to ensure that life produce reasons for maximized self-satisfaction. Even better, with the possibility of a long-lived life as eternal as possible... Too bad the life – what a brief life – of those who usually stay out.

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Social model, interdisciplinary and intersectoriality: challenges to social policies for disability in Brazil

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Social model, interdisciplinary and intersectoriality: challenges to social policies for disability in Brazil

Wederson Santos

From the 1970s, the debate in the humanities and social sciences on how to understand the disability phenomenon influenced decisively the way for countries to assess the social and health conditions of their populations. From an understanding based in biomedical knowledge, the assessment of disabilities began to be based on social, cultural, political and attitudinal aspects to describe disability beyond a reductionist judgment on aesthetic or biological standards of a body with abnormality. Thus, disability is no longer a construct of nature and mere identity sign, but above all a social, historic and political relationship of power which inscribes the bodies with variations in inequality and oppression situations.

Facing disability as a relationship permeated by inequality and oppression means to redirect the way we need to give answers to repair the injustices faced by people with disabilities. The so-called social model of disability, which began in the UK during the 1970s, was responsible for weakening the biomedical paradigm of disabilities, which for a long time had the hegemony of scientific authority to explain what disability was (Diniz, 2007). This change had consequences when shifting disability from a mere problem located in the health sector and of technological advances for a change that demand investments in public and social policies that promote equality between people with and without disabilities.

The social model of disability has its origin in the social movements of disabled people, which pointed the inadequacy of the biomedical paradigm in describing it as an experience of inequality and oppression (Ibid.). Gradually, the social model entered the academic spaces, favoring a thorough review of social theories that provided analytical views to situations

of oppression through the body in a similar trajectory to other themes, like feminism, gender and anti-racist theories, who also reported historical constructions of oppression. After this movement, the next step was the review of legislative and legal frameworks around the world to carry out the incorporation of principles of the social model in public policies for people with disabilities.

After an intense process of revision of the International Classification of Impairments, Disabilities and Handicaps (ICIDH), in 1980, the World Health Organization (WHO) published the International Classification of Functioning, Disability and Health (ICF) in 2001. The ICF was based on the debate about public health and contemporary epidemiology, besides the principles offered by the social model of disability, and sought to provide a tool to assess overall health situations in which people are inserted (CIF, 2003). ICF differs from the International Classification of Diseases (ICD) because this worries about the causes of the diseases, while the ICF focuses efforts on assessing the consequences for one's life of a specific health condition (disease, disability and incapacity) that may lead to restrictions of social participation in everyday life and in the community.

In 2006, the United Nations (UN), during the General Assembly, approved the Convention on the Rights of Persons with Disabilities. For the first time, there was broad democratic participation of disabled people in the discussion and preparation of this document. In its first article, the UN Convention states that

> persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others (2009a, [on-line]).

On the one hand, the use of ICF as a directive of public and social policies, as set by the WHO, establishes a set of challenges to public actions, which should redress injustices based on the guidelines of the social model of disability. On the other, the incorporation of the UN Convention to the Brazilian law, through the ratification of the Convention in 2008 by the Congress, requires a set of practices for the correct application

of its principles. The objective of this paper is to present an analysis of the institutionalization of guidelines and principles of the Convention on the Rights of Persons with Disabilities, of the UN, according to discussions of interdisciplinary and intersectoriality in social policies, in order to identify the main challenges for strengthening the social model of disability in the country.

After the Constitution of 1988 and social policies for people with disabilities

According to Pereira (2014), social policy is a complex concept, which does not suit the pragmatic idea of mere provision, governmental act, technical income or decisions taken by the State and vertically allocated in society. Understanding social policy requires thorough effort of knowledge of the movements, trends and relationships (Ibid.). Thus, social policies ultimately constitute a complex set of nature and function able to provide a social safety net such that citizenship rights are achieved for the realization of basic human needs of people. In turn, to Castel (2005) social protection is the condition of possibility for people to form a society in which individuals have access to a set of resources and rights to maintain relations of interdependence with everyone.

According to Di Giovanni (1998), to understand the meaning of social protection is necessary to locate the institutionalized forms in societies to protect part or all of its members from certain natural or social experiences arising from specific moments, such as age, sickness, material deprivation , restrictions skills, inequality in the promotion of opportunities, detachment from the world of labor, etc. Social protection is effected by means of resource redistribution mechanisms, with the objective of benefiting those unprotected by the efficiency of the economic system, promoting equal opportunities and reducing inequalities related to negative factors that reduce the potential and the autonomy of people. Therefore, social protection depends on economic, political, social and cultural relationships that are modeled to depend on each specific context.

Thus, analyzing the protection of the rights of persons with disabilities in Brazil means, first of all, to contextualize the Brazilian insertion in the global economic scenario. The social security systems tend to be structured with reference to the social organization of work, although they are quite different in each country, due to structural and economic issues. This organization depends on Brazil's insertion in the international division of labor, of the socio-economic development level of the country, the level of industrialization, the formation of the labor market, among other demarcations, such as manufacturing and social security legislation. Thus, the challenges for social protection of disabled people in Brazil have direct relationship with such characteristics that mark the place of inscription of people in the labor world, which certainly will be different from the major capitalist countries.

For example, the Brazilian social security, inaugurated with the Federal Constitution of 1988, incorporated principles of two models: the insurance logic (contributory, as the Social Security) and universal logic (as is health, besides the non-contributory logic of social assistance). However, the necessary constitutional affirmation of the social security system in the country in the late 1980s was not enough to create objective conditions from the 1990s to the materialization of the extended social protection to all citizens and to the disabled, in particular (Boschetti, 2006). Social welfare, largely dependent on the contributory logic of social security, opened flanks in the social protection system, only softened over the 2000s with the emergence of the Single Social Assistance System in 2004.

The analysis of the incorporation in social policies of the principles of the Convention on the Rights of Persons with Disabilities of the UN, in 2006, incorporated into Brazilian law in 2009, should consider this scenario. As different approach forms of rights can reflect different perspectives, because the focus of rights is one of the main organizing tools of social and political life, guaranteed protections may cause a change of the social framework of a particular society (Edmundson, 2006; Roig, 2006). In this sense, at the peak of struggles and political articulation during the 1980s in Brazil, social movements linked to deficiency causes understood this concept and were responsible for the claim of several rights guaranteed in the Constitution (Figueira, 2008; Sassaki, 1990). This policy articu-

lation was no different at the time of ratification of the UN convention, with constitutional status in 2008 (Diniz; Barbosa; Santos, 2009).

The articulation of diverse social movements and the political and social pressure during the Constituent period in the late 1980s gave emphasis to disability. Education, labor, accessibility and social assistance now had constitutional guidelines that favored the emergence of various policies to meet the demands for inclusion and citizenship of people with disabilities from the 1990s. However, such scenario represents modest gains compared to the many challenges to overcome in the last two decades, as can be seen in the inclusive education policy, labor market, removal of architectural barriers, accessibility, sports policies, leisure and culture, among others. Thus, in 2008, the Convention on the Rights of Persons with Disabilities was analyzed by the Brazilian Congress, which allowed this international legal instrument of human rights to have constitutional status in its application in the Brazilian law.

The Convention and the challenges in the Brazilian case

The approach on disability, especially in recent years, as one of the issues in the sphere of fundamental rights, of course, is revolutionary from the point of view of the conditions created to change the reality of persons with disabilities. In recent years, many democratic countries have made efforts to establish legal frameworks and public policies to provide answers to the idea that inclusion and social protection, that is, the right to participate in society on an equal basis with others, are necessarily fundamental rights of everyone. When the State does not promote such public actions, it contributes to the reproduction of conditions that maintain inequalities.

In this conception, during the General Assembly in 2006, the UN approved the Convention on the Rights of Persons with Disabilities as one of the most important legal and juridical frameworks so far for the protection of human rights of people with disabilities, establishing the attributions of the member states that adopted the convention. The innovation of the convention conceptions are mainly due to four reasons: it demarcated the change from assistance to the rights of disabled people, causing

changes in the regulatory framework of signatory countries; introduced the language of equality to grant equal treatment to persons with disabilities; recognized the need for autonomy with support for persons with disabilities; and turned the understanding of disability as part of human experience (Dhanda, 2008). The convention has the ability to refute the belief that, for years, was part of social and cultural values in many countries: that a disabled life is less valuable and that therefore the protection of a disabled life may contribute to the valorization of human diversity.

According to the text of the convention, the purpose of the document is the promotion and protection of human rights to ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, promoting respect for human dignity (Brazil, 2009a). This purpose opens space effectively to the full implementation of public and social policies that are capable of materializing fundamental rights of persons with disabilities. On the one hand, this prerogative is not exactly a special treatment to persons with disabilities in the midst of the materialization of public policies in regard of other specific groups, but, on the other hand, it challenges the functioning of the Brazilian state to find solutions and alternatives for implementing actions that dialogue with the exercise of citizenship and spaces that promote the autonomy of individuals.

Studies show that people with disabilities have fewer years of schooling than others, they live in the poorest families, cannot get a job, face major barriers to urban mobility, access to school, leisure politics and culture, have access difficulties to personal care and health care, among others (Brazil, 2015; Neri; Soares, 2004; Pires, 2009; Souza; Carneiro, 2007; Vaitsman; Andrade; FArias, 2009). In this context, the materialization of social policies in Brazil is challenging, especially for the group of persons with disabilities, which makes the incorporation of the UN Convention principles in Brazilian public policy even more complex.

Interdisciplinary and intersectoriality in social policies

The social model started considering the issue of disability as a socially constructed problem related to barriers to full integration of individuals into society. It is not an individual attribute, but rather a complex set of conditions created or exacerbated by the social context. This reinterpretation of disability from the perspective of the social model redescribes it as a restriction of participation of people with disabilities in society on an equal basis with others. This approach is based on the evaluation of various barriers (economic, political, cultural and attitudinal) encountered by people in their daily lives. That is, the deficiency is not the product of individual failure, but a matter socially created (Barnes, 2009).

Much of the principles of the social model were incorporated into the ICF, which favored the application of principles of the social model in policies for disabled people in several countries. The ICF allows evaluating the situations of disability because it evaluates functionality as positive aspects of the interaction between an individual (with a particular health condition) and their contextual factors (environmental and personal factors) (CIF, 2003). Thus, when the interaction takes place in a negative way, there are situations of disability. That is, the ICF gets to deficiencies due to assessing the consequences of the impediments (conditions and health status), and not by its causes.

ICF was adopted in Brazil in 2003 and since then began to influence social policies for people with disabilities (Ibid.). Embryonic in health and public transportation mobility policies and more incisively in social assistance policy in 2007, Brazil initiated the incorporation of the principles of the social model in its policies, programs and actions directed to people with disability even before the adoption of the UN convention in 2009 (Brazil, 2007; Pires, 2009). Using the guidelines of the ICF as guidance to public policies aims mostly at undermining the hegemony of the biomedical model, which, for years, described and assessed the deficiencies.

To a large extent, the centrality of biomedical power in the characterization of deficiencies makes it a challenge the appreciation and the consequent intervention to redress the injustices of life of disabled people. To Castel,

> to medicalize a problem is more to rearrange it than solve it, because it means to empower one of its dimensions, work it technically and thus cover its overall socio-political significance in order to make it a 'pure' technical issue , ascribed to the competence of a 'neutral' expert (1978, p. 189).

That is why the biopsychosocial approach to the ICF gains importance for social policies.

Thus, two of the main objectives in the use of ICF also end up becoming the main challenges to implement it: how to assess people with disabilities in biopsychosocial perspective? How to intervene in the reality of people with disabilities in order to remedy injustices, overcome barriers, ensure basic needs and promote citizenship through full compliance with their demands? To the first question, it is necessary to deepen the discussion of interdisciplinarity as a guideline of action of professionals involved in the materialization of social policies. In turn, for the second part of challenges, the discussion of intersectoriality in social policies becomes an essential prerequisite for how public responses should meet the demands for justice and equality of persons with disabilities.

Interdisciplinary in social policies for disability concerns, above all, the way the evaluations of people with disabilities should occur in order to select which are the people who should have access to goods, services, and specific programs and policies. It is the moment of medical examination, which is the first contact people have with public policies. If before the pragmatism of the International Classification of Diseases and Related Health Problems circumscribed a limited space and, in addition, an objective arsenal to deal with the disability ratings, currently with the prospect of the ICF and the UN convention, assess who are the people with health conditions who experience disability that should not do without the biopsychosocial perspective to place deficiency in its relationship dimension with the social environment and barriers.

Interdisciplinarity in social policies applies not as a proposal for destruction of specialization, as it sets the particular which is realized in the universal and vice versa, but as an invitation or warning to the specialist so that it becomes also a subject of the totality (Pereira, 2014). Interdisciplinarity, in this perspective, assumes that there is complementarity, horizontality and inter-relationship between the knowledge that form teams and/or institutions responsible for assess processes of people with disabilities. And the idea is not to draw attention only to the initial moment of diagnosis of etiological basis for health and therapeutic interventions, but to shed light on the large, dynamic and continuous processes of professionals involved in public policy and other interventions, in which the assessment of people with disabilities should strengthen the principles of the social model present in the ICF and the Convention.

The centrality of biomedical knowledge occupied an important place in the historical process, which circumscribed explanations and destinations for people with disabilities (Corbin, 2006). That is, before the structuring of modern medicine, disability, on the one hand, was subject to mystical and religious explanations, whose intervention often resulted in social practices of corrective, moralistic and discriminatory bias (Ibid.). On the other hand, medical knowledge learned to demystify disability, but essentialized it and naturalized it, as the paradigm of biomedical knowledge redescribed a disabled body as a deviation from the norm, therefore, susceptible of correction and healing. This movement, important to bring disability to the field of modern interventions, brought hard consequences to overcome, mainly regarding the need to address the legitimate demands of people with disabilities, as well as those linked to health interventions such as access to social rights, legislative changes for universal inclusion, and protection of dignity in diversity and addiction, among others. Thus, interdisciplinarity plays a decisive role in overcoming the biomedical centrality and at the same time strengthening the paradigm of the social model of disability.

Therefore, interdisciplinarity suggests reciprocal relationship between different knowledge with its specific and inherent contradictions, considering the rebuilding of the segmented unity of knowledge, which in reality is not compartmentalized. In addition, in interdisciplinarity, dif-

ferent knowledge intertwines to modify and enrich professional practices (Pereira, 2014). In this sense, multidisciplinary, i.e., the set of multiple knowledge that conform a practice, must have interdisciplinarity as role model and guiding principle to cement and strengthen the understanding that, before demarking identities, disability is a social relationship in which people experience participation restrictions due to the lack of adaptations of environments and structures and discriminatory attitudes.

Along with the practice of interdisciplinarity, intersectoriality gains increasingly more strength as a guideline for social policies. It is no different for actions directed to persons with disabilities. Intersectoriality is understood as an instrument of knowledge optimization, of skills, through synergistic relationships, sectoral policies towards a common goal to achieve a shared social practice (Ibid.). Intersectoriality in social policies requires research, planning and evaluation for the implementation of joint and integrated actions among other actions with different functions and objectives, seeking complementarity of these actions in order to enhance the goals to be achieved by certain social policies in an integrated vision to meet the demands of individuals (Ibid.). That is, through intersectoriality, social policies have more conditions to achieve the comprehensive care goals to the demands of persons with disabilities.

For example, when people with disabilities look for a health service, usually the location offers only one type of service to meet their demand. However, a health demand may have determinants related to education, labor and employment, social assistance, social security, mobility, access to culture and leisure, so the health service must offer this dimension in comprehensive care, through a joint work with other sectors and policies. For the health claim to be effective there must be a relation between health and the areas of social assistance, social security, education, labor and employment, sports and recreation and culture, among others. Intersectoriality allows a new front of action in social policies, so that actions have this practice as a goal and professionals act in this perspective, guiding them in the technical and professional work of health teams that serve people with disabilities.

In addition, government initiatives have a crucial role to promote intersectoriality in social policies, mainly because intersectoriality has to

do with how policies and other existing public actions must act jointly and in an integrated manner in order to meet the demands presented by users. For persons with disabilities, since 2011, Brazil has the example of the National Plan for the Rights of Persons with Disabilities – *Living without limits*, established by Decree nº 7612 (Brazil, 2011a). Altogether there are 15 ministries with specific tasks in *Living without limits*, which, in its article 3, establishes its guidelines, such as: the guarantee of an inclusive education system; expanding the participation of people with disabilities in the labor market; increased access of disabled people to social assistance and fight against extreme poverty policies; the expansion and qualification of the health care network to people with disabilities, especially the habilitation and rehabilitation services; besides promoting access, development and innovation in assistive technology. Actions such as these, from the federal government, states and municipalities, can greatly promote the intersectoriality of public actions.

The case of social assistance and social security policies in Brazil

One of the first policies that fully adopted the concept of the UN convention of person of disability was the social assistance policy through the Continuous Cash Benefit (BPC), of the Organic Law of Social Assistance in 2011 (Brazil, 2011b). Created in 1993, BPC is one of Brazil's biggest income transfer programs and is responsible for ensuring a minimum monthly salary to more than 3.1 million elderly people aged 65 or older and disabled people who do not have means (nor by the family) to provide for their survival. Along with the Bolsa Família (Family Grant Program), BPC is seen as structuring of the social assistance policy (Vaitsman et al., 2009).

The BPC case is emblematic to examine the challenges of implementing the directives of the social model, because even before adopting the concept of the convention in 2011, the law of social assistance benefit already used the guidelines of ICF since 2007 to assess people with disabilities applicants for social protection (Brazil, 2007; Santos, 2010). After

over ten years using a variety of different models to assess people with disabilities, the Ministry of Social Development and Fight Against Hunger, responsible for managing the welfare benefit, decided to adopt, in 2007, ICF in medical experimentation for granting the benefit in order to incorporate the social model, replacing the biomedical hegemony in the evaluation of deficiencies for granting the benefit. So when there was the ratification of the UN Convention with constitutional status in Brazil, in 2008, the operation of the BPC was already more sensitive to the incorporation of the convention principles.

The need for improvement is constant in any public policy and, in the case of BPC, is no different. The process of evaluation of deficiencies for granting assistance benefit has gone through several improvements since 2007 and in 2015 reaches its third version of the assessment instruments, which shows how the implementation of the social model principles are challenging, and adjustments are continuous and needed (Brazil, 2009b; 2011c; 2015). With the incorporation of the concept of disability of the convention in 2011 to the law of the welfare benefit, the main challenge has become finding appropriate ways of assessing long-term impediments, according to the convention (Brazil, 2009b). In the case of BPC, it was established that long-term are those impediments over two years (Brazil, 2011c). On the one hand, this brings objectivity to the evaluation process. On the other, this two-year delimitation may also have consequences for the scope of social protection of the welfare benefit when it is not extended to people with impediments of short duration, but that could gather the necessary conditions to access social protection.

The social security policy was the second policy that started to adopt the concept of person with disabilities according to the terms of the UN convention and, therefore, in accordance with the paradigm of the social model of disability. It was through the assessment process of pension by age or time of contribution of people with disabilities after the publication of the Complementary Law nº 142, in 2013 (Brazil, 2013a). The law aimed to provide differential treatment to persons with disabilities upon request of their retirement by stating that if the people of the Brazilian Social Security System had a mild, moderate or severe disability, they

could retire, respectively, two, six or ten years earlier, when compared to people without disabilities (Brazil, 2003).

According to the article 5 of the convention, which states that"specific measures which are necessary to accelerate or achieve de facto equality of persons with disabilities shall not be considered discrimination" (Brazil, 2009a, [online]), the law 142 aimed to improve the social security policy for people with disabilities as well as to incorporate the guidelines of both the convention and the ICF to the evaluation process of people with disability claimants of social security protection (Brazil, 2014). As established by the Joint Ordinance nº 01 of 2014, the assessment of disabilities for retirement applicants of the law nº 142 will be performed by medical expertise and the social service of the Brazilian Institute of Social Security in order to characterize the disabilities and long-term impediments, besides establishing a gradation in mild, moderate and severe disabilities, as required by law (ibid.). As in the case of BPC, the Law nº 142 seeks to ensure interdisciplinarity as a guideline to be considered in the disability process of evaluation.

Since its beginning, the assessment of people with disability that required retirement according to the law nº 142, in March 2014, reached more than 39,000 people that were evaluated and almost 13,000 had disabilities characterized under the law to fit concessions retirement adopting the new criteria.[1] The decree published in November 2014, ensuring the start of evaluations of people with disability that required retirement, specified that, for a period of two years, the assessment process for people with disabilities had to go through accompaniments and improvements, with the aim of improving, above all, the instrument used in the evaluation process (Brazil, 2013b, 2014; Franzoi et al., 2013). The constant improvement process of evaluation of the instrument relates mainly to the forms of gradation of disability, but also to the necessary improvements to promote interdisciplinarity in the assessment process, which can greatly strengthen the principles of the social model present both in ICF as in the UN Convention.

1 Internal management data provided by the Brazilian Institute of Social Security.

Final considerations

It is long and challenging the way for the incorporation of the guidelines of the social model of disability, establishing a new paradigm for understanding the intervention of public actions aimed at the disabled person. The Brazilian case is emblematic, because the challenges for the institutionalization of the principles of the convention have not been sufficiently paralyzing. That is, given the complexities in the management and implementation of social policies, there has been some success in the venture, as shown by the cases of health care policy, through the Continuous Cash Benefit (BPC), and also the social security legislation through the retirement of people with disabilities, established by the Supplementary Law nº 142.

The need for constant improvements of the disability evaluation process has been a requirement in the legislation of both the BPC and the Complementary Law nº 142, mainly regarding interdisciplinarity understood as the exchange of different knowledge, enriching one or more field of knowledge (in the case of BPC and the law nº 142, there is the medical expertise and the social service of the Brazilian Institute of Social Security) in the evaluation process of the deficiencies in order to incorporate the precepts of the social model of disability.

In addition, social policies aimed at people with disabilities will need, from now on, to empower increasingly intersectoriality as a condition to meet in a joint and integrated manner the various demands of persons with disabilities. Intersectoriality must be understood as more than a mere adjustment due to the incompleteness of various sectoral policies, seeking to achieve mechanisms to dynamize and strengthen the goals of all social policies integrally. The progress achieved in social assistance and social security policies, as discussed previously, should be a motivating factor to other policies such as health, labor and employment, transport, culture and leisure, sports, among others, able to carry on the principles of the convention that result in changes in of practice for the enhancement of human rights and citizenship of people with disabilities.

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A new way of thinking

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A new way of thinking

Denis Russo Burgierman

The use of psychoactive substances has been a feature of virtually any human community, from the caves of nomadic times to the contemporary megalopolis. From tribal societies to great empires, from medieval kingdoms to modern nations, it is very difficult to find a single example of human settlement in any region of the world where there is not at least one substance that alters the consciousness, either for medical use, religious purposes, recreational use or any combination of these three spheres.[1]

These substances are dangerous by nature; after all, they alter the essence of who we are: how our brains perceive the world. Therefore, they have always been treated very carefully. Traditionally, for millennia, the main instrument that humankind used to deal with drug use was the culture - not the law.

In every society in each part of the world, there has always been a set of rules, prohibitions and rituals regulating the use of drugs in order to reduce their risks and damage[2]. These rules were seldom written. They were just memes[3], which arose more or less spontaneously and were passed from individual to individual, from generation to generation, slowly adapting to times, influencing behaviors.

Throughout history, there have been some rare experiences of a more formal control. For example, Napoleonic France banned the use of marijuana in the occupied Egypt in 1798. However, laws like this have

1 A good essay on the possible evolutionary explanations for the use of drugs by humanity can be found in the book *The Botany of Desire*, of Pollan (2002).

2 The book *Drogas e Cultura: Novas Perspectivas*, edited by Labate et al. (2008), has a number of examples of how this regulation by culture occurs.

3 The theory of memes, that are the minimum units of cultural information, analogous to genes, which are the minimum units of genetic information, is the brainchild of evolutionary biologist Richard Dawkins, in his classic *The Selfish Gene*, 1976.

always been historical rarities - exceptions in the midst of a world in which the rule were subtle cultural controls.

It was not until the twentieth century when, suddenly, humanity decided to try a new strategy to deal with drugs: prohibition. Throughout the first half of last century, several regions have enacted laws that criminalized trade and the use of certain drugs, and gradually the severity of these laws grew. In the 1970s, US President Richard Nixon named this new global policy that took shape: War on Drugs. The century came to an end with virtually every country in the world imposing severe criminal laws to curb trade and drug use - often more severe than even the laws to punish murder. It was the pinnacle of War on Drugs.

Apparently, this pinnacle is passing. While the ban remains in effect in almost every country in the world to almost all psychoactive substances (with some notable exceptions, such as drugs produced by pharmaceutical industries, alcohol and tobacco), there is all over the place indications that the pendulum arrived to its extreme and begins to return. We are witnessing a widespread substantiation that the War on Drugs was a huge failure, since it not only did not solve the problems associated with drug use, but created a number of other problems, some much more severe than those they tried to address.

For example, it increased violence, because created an immensely profitable market without any oversight or state regulation. Thus, it produced an incentive for large criminal organizations to form in order to compete for these markets. It also created a huge source of income that has enriched these organizations. Another side effect of the War on Drugs in certain countries, including Brazil, was a mass incarceration process, especially among lower classes and ethnic minorities, more vulnerable to police action[4], which institutionalizes racism and demoralize the state before these groups. Not to mention that a clandestine market as profitable as this turns out to be an inevitable source of corruption, which undermines institutions and democracy.

4 A good analysis of why the War on Drugs tends to lead to preferential incarceration of ethnic minorities, lower classes and younger individuals can be found at *Drugs and Drug Policy: What everyone needs to know*, by Kleiman, Caulkins and Hawken (2011).

A landmark on drugs debate was the year 2011, when several major political leaders who led the War on Drugs in the 1990s made a joint declaration assuming their failure and suggesting a change of course in the new century, towards a more flexible and effective regulation (Global Commission on Drug Policy, 2011). Worldwide, most political systems have reacted slowly to this change of mentality, because public opinion tends instinctively to prefer stricter approaches, due to the widespread fear that drugs cause.

Even so, it started popping up around the world, especially in the Americas and Europe, trials with laws not so strict and fuller of subtleties to regulate the use of drugs, instead of simply prohibiting all. In other words, a complex regulation, without single answers, something perhaps more similar to those systems based on the culture that humanity has adopted for millennia to deal with drugs.

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Two schools of thought dominated public policy on drugs in the second half of the twentieth century: the War on Drugs (WD) and the Harm Reduction (HR). The WD, designed by the United States from the bureaucracy of the federal government, assumes that drugs are bad by definition and must be fought relentlessly - the production has to be destroyed, all persons involved should be incarcerated, and all use must be restrained. The goal of WD is definitely to eradicate every drug in the world, and a measure of success is simply to reduce drug use.

The other paradigm, HR, has its origins in the 1960s, when it became the guiding principle initially in the Netherlands and soon after in other European countries such as Switzerland, Germany, Denmark and, to some extent, the UK. The HR is more pragmatic: admits that the goal of putting and end on drug use is a utopian madness, impossible to achieve. It is also more reasonable: considers that there are better and worse use of drugs and that to turn the worse use into the better use is already a gain. The classic action of early HR was distributing needles for heroin users to avoid AIDS epidemic with potential to harm the whole society - they discovered that this type of action does not increase drug use, but significantly reduces HIV contamination and public health spending. According

to this way of thinking, more important than putting an end on drug use or simply reducing usage rates is to try to reduce or eliminate the damage caused by them.

If you compare the two approaches in the twentieth century, the WD won by a landslide in terms of influence. Despite the reasonable prevalence of HR in parts of Western Europe, Australia, Canada and a handful of countries, most of the world followed the North Americans, because there was great financial incentives for those who did, in the form of international cooperation agreements.

However, by the end of the century, the data on concrete results of the two approaches began to accumulate and the conclusion is clear: neither HR nor WD can prevent people from using psychoactive substances. Nevertheless, HR is much better in reducing the damage they cause. Countries that have opted for HR have less AIDS, less hepatitis C, less drug use by minors, less potent drugs, almost no overdose, less prison overcrowding, less crime, less dependence. Anyway, HR works better.[5]

The proof is that today, in 2015, most of the world's countries have adopted at least a part of the prescriptions of HR in their systems. [6] Even where the laws have not changed, the discourse has changed: today even the most conservatives admit that it is more important to reduce the harm caused by drugs than be concerned only with the drug use index.

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When the War on Drugs was formulated in the 1960s we knew very little about the functioning of complex systems - was only then that the complexity started to be researched in universities. [7] Today we know that, because of this unawareness, people who planned and implemented the WD made some serious misconceptions.

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5 A good summary of the advantages of HR over WG can be found in the report *War on Drugs* (Ibid.).

6 The report *Taking Control: Pathways to drug policies that work*, by the Global Commission on Drug Policy (2014), summarizes the most successful changes that are occurring around the world.

7 A good textbook on strategies to deal with complexity is *Making Things Work: Solving complex problems in a complex world*, by Bar-Yam (2005).

The WD was declared to make fewer people would use drugs - in fact, at that time, it was believed that it would be able to definitively eradicate every drug, ridding the world of this problem. The plan was simple and straightforward: we ban drugs, destroy up all plantations, people stop using it and we win the war. As is known, it did not work: in fact, today there is a debate whether the WD ended up causing an increase in drug use.

The mistake is to ignore that the consumption of psychoactive substances follows a much more complex dynamic than a linear cause-and-effect relationship. There are millions of different motivations for using drugs, the most diverse: relaxing, escaping from responsibility, treating pain, feeling alive, killing yourself, for social, emotional, medical, religious reasons, having fun, forgetting - and the list could go on and on for dozens of pages. The WD's makers did not realize that, by prohibiting it, they were just adding up on more reason for using or not using drugs.

You cannot set strict rules in complex systems. The science of complexity teaches that, instead, the best one can do is modular incentives in the system, in order to convince the greatest number of people voluntarily to behave better.

One of the WD errors was not predict what became known as bladder effect. The effect, now well understood, describes a drug market property: it behaves the same way that one of those inflatable balloons from children's parties. You press one end and the other inflates. That is what tends to happen every time the WD acts. When you destroy coca plantations in Colombia, new crops appear in Peru and Bolivia. If drug dealers are arrested in the slums, others start working with that. If a drug is strongly suppressed, another appears on the market. The more you tighten the bladder, the more it inflates: the more violent is repression the more violent is drug trafficking.

This phenomenon occurs because the drug market is insanely profitable and demand never ceases. Financial gain is too large - and it gets higher when the repression increases. It does not matter how great the risk is, there will always be someone willing to face it - because the rewards are immense. A single successful transaction easily is worth millions of dollars. This helps to understand why you cannot avoid easy availability of drugs even where their trade is punishable with death penalty.

The WD failed because it ignored the fundamental principle of complex public policy: the system that controls a thing can never be less complex than the thing itself. No government will ever be able to control in detail a complex behavior that is widespread in much of the population. It is physically impossible - we would have to hire a public official to follow each user.

The only way to control such a complex system is by creating an equally complex network to watch over it. This network needs to be the whole society, or at least much of it, including the education system, health system, the family, the city, the labor market. Police and criminal justice, alone, will never be able to regulate something so immensely complex.

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In 2001, a small country very close to Brazilians set in motion a new national strategy to deal with drugs, entirely based on HR. Portugal withdrew from its law any moral intention and established a new procedure for dealing with users, which combined all the strategies that had proven to work around the world. They decriminalized drug use, set up an intelligent health system to deal with those who needed help but did not legalize any drugs - all remained banned. [8] Today, the good results of the new Portuguese system are evident both in health and in public safety. [9]

An interesting feature of the Portuguese system is its willingness to influence the cultural dynamics surrounding drugs, rather than simply impose a single behavior to everyone. The system tries to reach out to users, understand their usage patterns, map the risks and then develop strategies to mitigate them. It is a much more complex strategy than the WD that simply sent out vehicles to these places to arrest everyone, only to find the crack houses in the hands of other people the next day, with several unexpected negative consequences, including a frequent increase in violence caused by competition for vacant retail outlets.

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8 I made a more detailed description of the Portuguese system in my book *O Fim da Guerra* (The End of War, by Burgierman, 2011).

9 A good analysis of the results obtained in the first ten years of the Portuguese system implementation can be found in *What Can We Learn from the Portuguese Decriminalization of Illicit Drugs*, by Hughes and Stevens (2010).

More recently, another small country close to Brazil made headlines when it redesigned its system to deal with marijuana. Uruguay implemented in 2014 the *Responsible Regulation* and became the only country in the world where marijuana is legalized and regulated to production, distribution and use.[10]

The system now takes its first steps, although it is still stumbling. Homemade planting and medicinal use are in full swing, but sales in pharmacies has proved more difficult to implement than previously thought. Users also resist in registering in the system, because of concerns about their privacy. It is too early to analyze the results.

However, the most daring models of new systems to handle drugs are emerging in a surprising place: the United States. The country that led the global deployment of WD became in the last decade the focus of experimentation with new drug policy, especially for marijuana. In part, this is due to two characteristics of the American Republic: federalism and direct democracy. In the US, each state has huge autonomy to create its own laws, and there are several mechanisms for citizens to propose new laws and approve them by referendum. Through these mechanisms, almost half of the country legalized the medical use of marijuana, and four states - Colorado, Washington, Oregon and Alaska - legalized production, trading and sale of marijuana for any use (the District of Columbia, where is located the capital Washington, DC, also legalized the use of marijuana, but not the trade).

In many experiments of relaxing drug laws, a remarkable phenomenon was that the level of control over the use and drug markets has increased, rather than decreased, because the state has delegated partly this task to interested sectors of society. For example, the Netherlands, in the 1970s, when legalized marijuana trade in coffee shops, ruled that it was up to establishments to ensure public order and safety of users. The result was a reduction of violence and of the risks associated with this trade.

Similar events have been observed in various parts of the world. For example, in the city of Oakland, California, the medical marijuana industry

10 To know in detail the Uruguayan system, visit www.regulacionresponsable.org.uy.

helps fund the policing and street lighting in the area where it is installed. In Spain, some of the cannabis user unions, which maintain collective crops, have harm reduction programs in order to educate users so that they avoid harmful patterns of consumption (Burgierman, 2011).

One thing in common between these experiences is that, despite all the expectations they generated, when they were finally implemented, a surprising normalcy followed. The most interesting thing that happened was that it almost nothing happened. Drug use did not exploded and people were not crazy. The same people that already used drugs continued to use them. Meanwhile, there was a series of small gains in health, safety, public space, taxes collection and on people's lives.

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Another change taking place in the global debate about drug policy is that the discussion does not seem to further limit the damage caused by drugs. There are also benefits. For example, the medicinal uses of substances like marijuana and hallucinogenic drugs.

For many years, research on the medicinal potential of illegal drugs were greatly hampered by legal restrictions. Any statement about the pharmaceutical utility of these substances was ridiculed and strongly criticized, because it contradicted the basic premise of WD that drugs are always bad.

However, in recent years, a large number of serious scientists, of sound institutions, many of them with no prior appreciation for drugs, started doing quality research on the subject. It is a recent phenomenon, typical of the twenty-first century, and therefore the results are still preliminary.

Nevertheless, there is no longer doubt that marijuana contains a biochemical arsenal that can be very relevant for the treatment of a wide range of complex medical conditions, from cancer to autoimmune diseases, from chronic pain to degenerative diseases and various neurological and psychiatric conditions. [11] Marijuana can indeed be tremendously harmful for some people. However, for others it could save people from death or greatly reduce their suffering.

11 The documentary *Illegal*, directed by Tarso Araújo and Raphael Erichssen, of which I was one of the producers, brings a good balance of the debate on medical marijuana in Brazil.

Another area of research that has gained strength in recent years is about the therapeutic potential of psychedelic substances like psilocybin (mushroom), LSD, ibogaine and ayahuasca. [12] Apparently, these substances are all able to provide very intense experiences that have the power to change substantially the attitude of a person towards life. This effect seems to be very useful in helping patients cope with behavioral problems. For example, helping dependents to overcome an addiction or giving strength to terminal patients to overcome depression and face death with maturity and tranquility.

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All these surveys make us think about the biological role of psychoactive drugs to our species. If almost all communities in all regions of the world in all periods of history used some psychoactive substance, would it not mean these substances are in some way important to us - or at least for some of us?

One-year-old babies often like to turn around its own axis until dizzy - and before they turn two are able to find it funny and to laugh as they stagger. Children and adolescents are generally the most favorable people to seek experiences that change their perception of the senses - experts speculate that it is a strategy that evolution imprinted in our brain to expand cognitive ability during the years of brain development.

Our species - like many others - is equipped with a "hunger" for drugs (just as there is an appetite for food and another for sex) (Siegel, 1989). In high stress situations, for example, many of us have an almost irresistible desire to alter consciousness. Suppress appetites using an external force is something that rarely works, as anyone who live with an eating disorder or any behavioral addiction knows.

However, that does not mean it is impossible to live healthily with a big appetite too. A person suffering from binge eating can learn to eat carrots instead of bacon, for example, with large gain in quality of life, but to create these alternatives is not something that can be done through the Criminal Code. A law prohibiting bacon probably would work the other

12 Michael Pollan tells the history of the resurgence of research into psychedelics beautifully in the report *The Trip Treatment*, published by The New Yorker in February 9, 2015.

way around, increasing child resentment against the carrot and giving conditions for the emergence of a violent illegal trade of bacon.

Only culture is sufficiently complex and subtle to place various incentives in people's life, in order to favor the best habits and discourage the worst. Increasingly, systems for handling drugs are intricate incentives networks designed to influence culture, rather than rigid rules applied identically to all.

This is a profound change of mentality. In the twentieth century, it was believed that the only way to deal with such a serious problem as drugs would be with a global, concerted effort of hipervertical logic: the UN setting rules and each national government implementing them at the same time without room for trials. Today it is becoming clear that this hierarchical way of thinking simply does not work with complex problems. Since drug use is an individual matter, which varies tremendously from person to person, you can only control it with a horizontal network of regulation, flexible and diverse. Increasingly, the solutions to the problem are local, thought for specific situations, capable to be applied differently to each person.

Of course, this change will not happen from one moment to another. In much of the world, governments, the police and justice systems are in the hands of people created under the influence of the WD. It is natural that these people do not want to give up the power to govern the systems in their countries in a central way. What we are seeing now is a slow change, with a new generation, created within a new paradigm, gradually taking over the institutions. These people tend not to make the same mistakes.

A new way of thinking already dominate the qualified debate about drugs. It is expected that these new ideas end up resulting in a new way to deal with the issue - a way that is worthy of the human complexity.

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