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REFLECTIONS ON THE PARALLELS AND SALIENT SIMILARITIES BETWEEN THE SCIENCES OF ECONOMICS AND MEDICINE

Eqbal Al-Rahmani, Ph.D.
Kuwait University, Kuwait

Ali Arifa, Ph.D.
Box Hill College, Kuwait

Abstract

The primary objective of this article is to identify the main parallels and salient similarities between the medical science and mainstream economics, in particular with respect to research methodological issues. The focus is on highlighting the shared methodological features in the two conventional disciplines that influenced prominently their contemporary development. The analysis suggests that these shared methodological features have been contributing, at least partially, to the failure of the medical science and the science of economics in their conventional paradigms to tackle more effectively the considerable problems faced by policy makers with regard to the health care system, health status, ecological strength and human well-being in general. Paradoxically, this tendency has been transpiring despite the remarkable track record of achieved economic growth, the perpetually increasing spending on health care, and the extraordinary level of technological advancement. We advocate the necessity for embracing integrative holistic approaches within these two fields, at both the academic and socio-political levels, to better address the complex issues of human and ecological health and well-being.

Keywords: Conventional medicine, integrative approach, neoclassical economics, well-being

AUTHOR NOTE: Please address all correspondence to Dr. Ali Arifa, Box Hill College, P.O. Box 29192, Safat 13152, Kuwait. Email: a.arifa@bhck.edu.kw

INTRODUCTION

It is common knowledge that the medical science and the science of economics have a number of significant resemblances, at least in the sense that both sciences share the same proclaimed goal of promoting human well-being. Yet, there has not been much literature focused on analytical comparisons of the two sciences. This research is conducted with the motivation to bring together some of the more salient similarities and parallels between them. The primary objective of this paper is to analyze the merits of the proposition that there are fundamental resemblances between the medical science and mainstream economics, in particular with respect to deeply rooted methodological considerations. In doing so, the paper pays special attention to the identification of the common limitations of the two conventional disciplines. Furthermore, an attempt is made to explore if these parallels and salient similarities between the two sciences are pertinent enough to the advancement of a more plausible integrative vision in each.

It is crucial to clarify from the beginning that "medical science" in the context of this investigation refers to research about the human body and treatment of diseases and not what is commonly referred to as "health economics".[1] Accordingly, the use of the terminology "conventional medicine" in this paper refers to the biomedical model or modern western medicine; while the terminology "conventional economics" refers to the mainstream Neoclassical paradigm (with its marginal analysis orientation).[2]

Reviewing early literature, and as an attempt to investigate the theoretical interlink between medicine and economics in the broadest sense, it can be revealed that it was actually some famous physicians who were among the pioneers in relation to performing socio-economic analyses. Indeed, Francois Quesnay, a renowned French Scholar with significant research work in the field of economics during the mid-eighteenth century, was a physician at the court of Louis XV. He was the most prominent person in the French school of economics known as the “Physciocrats”. Queney’s most famous contribution was the “tableau économique”, which illustrates the circulation of production and income among the three main social classes that shape the society. His closed system of income and commodities circulation in the economy is inspired from the system of blood circulation within the human body. As noted by Heilborner (1953), Quensay’s economic contribution was in fact an authentic physician’s insight. Quesnay himself was influenced by the intellectual contribution in the field of economics by Sir William Petty in England. Petty, who himself was a physician, had in the late seventeenth century a major contribution to the advancement of classical economic thought through the development of a number of theories on major areas of what would later become the science of economics.

Later on, in the 19th century, the prominent German pathologist Rudolf Virchow also observed the strong link between socio-economic and human health conditions. He saw politics, social science, and education as applied techniques of medicine to the "body politic". Realizing the poverty health link, he called for a program of socio-economic

reconstruction, including full employment, higher wages, the establishment of agricultural cooperatives, and universal education (Taylor & Rieger, 1985).

Other types of reflections on the parallels and salient similarities between the medical and economics sciences have been attempted more recently, albeit not with a great deal of fortitude. For instance, Korani (1983) applied conventional medical classification criteria to diagnose the main economic 'pathology' of the developed economies (e.g., inflation, unemployment, growth disturbance and inequitable income distribution). In his reflection, he highlighted the main 'side effects' of the proposed conventional economic 'treatment' of each 'disease'.

Fundamentally, most economic analyses are dominated by commodities and their interrelations. Profoundly, they are focused on maximization of economic growth and welfare. Yet, and in spite of the accelerated technological and increased levels of global economic growth and consumption that have improved the average 'quality' of life in the world, the consequence of these processes do bear many ill side effects. This is related to the fact that not all social groups and countries have shared these 'benefits' equitably. The notion of 'benefit' in this sense to human, social and environmental well-being has been widely challenged in the literature, in particular by many social and environmental organizations who argue that rapid economic growth as recorded in the world has not even secured adequate health standards for all human kind. For instance, the World Health Organization (WHO) presents an assessment of the world health status in 2006 shared by many observers and often expressed in different public spheres:

> *"In this first decade of the 21st century, immense advances in human well-being coexist with extreme deprivation ...The world community has sufficient financial resources and technologies to tackle most of [the] health challenges; yet today many national health systems are weak, unresponsive, inequitable – even unsafe".* (World Health Report, 2006, p. xv)

More recently, as acknowledged in Ostry et al., in a publicized report released in 2014 by the International Monetary Fund (IMF), the institution that has been known to be fully unwavering in regards to the necessity of promoting fast economic growth, economic inequality has in reality accelerated in both advanced and developing countries. The report also corroborates that the widening gaps between the rich and the poor have every so often undermined the improvement in public health and other social services, in addition to adverse effects on political and economic instabilities.

On the parallel side, the science of medicine, even with its remarkable track record of progress, especially after the Second World War, its register of achievements has not been totally free from some fundamental blemishes. Indeed, as Le Fanu (2000) points-out, throughout the historical account of modern medicine, there has always been a four-layered paradox that is arguably unharmonious with the highly acknowledged post-war medical

successes. These are: 1. the rising number of disillusioned physicians; 2. the rising number of the 'worried well' (the proportion of the population concerned about their health); 3. the rising popularity of alternative medicine; and 4. the spiraling costs of health care.

It should be noted that securing financial resources for spending on health care, while necessary, is undeniably not a sufficient condition to shape-up the extent of medical development. To illustrate, 2013 data from the United Nations reveal health status indicators in countries with high per capita expenditure on health care (such as the USA), that turned-out to be not significantly different from those in countries with much lower per capita expenditure on health care (such as Bulgaria, Costa Rica and Cuba). On the other hand, while many low income countries are still in immense need for greater expenditures on basic health care (and other basic human needs), many wealthier western societies have already reached a state that can be characterized by decreasing marginal medical returns with respect to such expenditures, in particular as related to medical technologies (Jacobzone, 2003). At the same time, many countries with advanced economic and technological conditions, and with high per capita expenditures on health care, still do experience significant medical hazards, such as surgical misadventures, drug reactions, missed diagnoses and hospital acquired infections (Ornstein & Sobel, 1999; Brezis & Wist, 2011). The increasing deaths in the USA occurring as a result of such hazards have led many researchers to regard medical errors as a leading cause of death and injury, (e.g., Lazarou et al., 1998; Leape, 2000; Starfield, 2000). Undoubtedly, there are many complex socio-economic, political, medical and technological factors contributing to the shortcoming of the health system outcome. The leading of these factors are inherent to the role played by the medical science industry. Other factors are linked to issues such as political and social stabilities, the orientation of the national socio-political system and its impact on income distribution and health access, the role played by international organizations such as WHO and WTO, the massive development of many of the capitalist industries that have contributed to unhealthy living styles, the environmental degradation, the deepening of consumerism, and the continuous cuts in non-market social care services, which have been exacerbated by the recent economic crisis causing further increases in unemployment and personal and national debt burdens. Having said this, this paper will mainly focus on the factor most related to methodological approaches and philosophical orientations of the science of conventional medicine. These approaches and orientations are assessed against those in the science of conventional economics. It will be argued that the adoption of such approaches and orientations in both sciences plays a part in yielding a number of serious inadequacies in both the health statuses of people, and their economic and social well-being in general.

The remainder of this article is structured as follows: The next section presents an analysis of the parallels and the salient similarities between the medical science and the science of economics in their two conventional paradigms, focusing primarily on

methodological aspects. We then analyze the contribution of new integrative paradigms to the advancement of both of sciences, before making concluding remarks in the last section.

The Methodological Approaches and Philosophical Orientations of Conventional Medicine and Economics

The shared underlying philosophy of science accounts for many salient similarities between the conventional sciences of medicine and economics. Table 1 below summarizes the main shared features. In his valuable book *'The Turning Point'*, Capra (1983) elaborates on the common features thoroughly. He critically traces many sciences, including conventional economics and medicine, to their original mechanical Cartesian foundations. The tracing of the medical model to these historical roots has been recognized within the medical and psychological literature (Engel, 1977, 1992; Pauli et al., 2000). Under this view, in their pursuit to become more 'scientific' and to disengage from their social and artistic heritages, both fields had to adopt the rational, linear, mechanistic, and reductionist culture of the seventeenth century of Newtonian physics and Cartesian philosophy.[3] A similar view has been strongly argued by Max Weber in his theory of rationalization, to such an extent that the Western world departed from the state of mystery and unknowable powers into a state whereby humans master everything through knowledge and technology. This development had influenced many aspects of life including those with direct relevance to medicine and economics (Hewa, 1994,1995).

The remarkable scientific developments of the 19th and 20th century recorded in the fields of physics and chemistry could not break-off the robust basis of the reductionist approach pursued by the conventional sciences of medicine and economics. The newer theories, such as thermodynamics, co-evolution, relativity and quantum physics, and more recently chaos and system theory, have challenged the previous mechanistic reductionist philosophy; and have provided evidence that the universe with all its component atoms, particles, subsystems, and systems, including human bodies and economies, are overwhelmingly complex, dynamic and, interdependent. It has become increasingly clear that these systems would not be understood with absolute certainty and 'objectivity', but only within a set of probabilities affected by the researchers' position (Capra, 1983; Engel, 1992). Both conventional medicine and economics, however, continued to deepen their abstract and mechanistic paths through emphasis on quantitative research tools to reach 'objective scientific' diagnosis and remedies. As such, physicians, economists and policy-makers remained for the most part faithful to applying these diagnoses and remedies to all patients of the world and to all economies, respectively, regardless of their potentially very different contexts.[4]

However, despite the sustained adherence of both sciences (economics and medicine) to abstraction and to the mechanistic approach, they have nevertheless evolved. Indeed, neoclassical economics, with its dominating marginal analysis, has gradually overshadowed the broader previous perspective of classical political economy.

***Table 1*. Characteristics of Conventional Medicine and Conventional Economics**

	Conventional Medicine	Conventional Economics
Abstraction	Patients are reduced to disease confined to external factors (e.g. germ theory causing cells dysfunction) in isolation of the patients and their environmental, psychological, social, nutritional, and life style context.	The economy is viewed in isolation of the political, social, cultural, historical and ecological context.
Fragmentation	Viewing the patient as separate unrelated parts that can be checked and treated separately. Addressing acute more than chronic problems, hence recurring health problems continue (like cancer and heart diseases).	Viewing the economy as separate sectors and units, that each can have separate policies. Addressing acute more than chronic problems, hence recurring economic problems continue (like inflation and unemployment).
Mechanistic	Based on the Cartesian dualism, the human body is viewed as a machine which is composed of separate parts. Disease is seen as a technical problem that could be measured, quantified, and eventually controlled (e.g. manipulating cholesterol levels with drugs to control heart diseases).	The economy development and well-being is seen as a technical process that could be measured, quantified, and eventually controlled (e.g. manipulation of the interest rate by the Central Bank to control inflation).
Research orientation	Adoption of empiricist research that emphasizes measurement and quantitative approach. Exclusion of non-measurable factors.	Adoption of empiricist research that emphasizes measurement and quantitative approach. Exclusion of non-measurable factors.
Objectivity & Generalization	Claims of value free research. Thus, objective diagnosis and treatment procedures (e.g. drug prescriptions & surgeries) are applied to all patients in all societies regardless of their different life style and environmental and social context.	Positive economics' objective analysis and policies are recommended to all economies regardless of their socio-political and historical context, (e.g. similar IMF structural adjustment 'prescription' is given to all developing countries)
Ultimate objective: Human well-being	Medicine shifted its attention from the patient to the disease and to the advancement of medical technology and drug application.	Shift of attention from well-being towards advancement of technology, maximization of profitability, and economic growth *per se.*
Technology	Extensive dependence on expensive technological solutions to health problems, regardless of their effectiveness and availability of simpler and safer alternatives.	Continuous technological utilization, for production purposes, regardless of their impact on human and ecological well-being.

This "scientific" evolution had gradually persuaded the analytical interest away from understanding the whole economy, with its social classes that determine the relations of production and income and wealth distribution, to emphasis on technical analyses of separate microeconomic units. Neoclassical economics reduced social classes to 'rational' individuals, acting in specific and restrictive hypothetical markets, where their sole aim had evolved to merely maximize their self-interest in terms of either profit or utility (although utility is dependent on value judgments and therefore very hard to measure). Under such circumstances, policies often recommended for both micro and macro issues are typically designed within restrictive assumptions abstracting from many social and political dimensions, and often abridged due to manipulations of technical coefficients. Technical policy prescriptions for improved 'performance', such as those imposed by the IMF on many low income economies, overlook important dimensions, (e.g., the prevailing poverty and unequal income and wealth distribution), often leading to further exacerbation of poverty and inequality.[5] At times, it is against these very exacerbations that even the IMF has decided to raise a warning flag (e.g., as illustrated in Ostry et al., 2014).

The science of Medicine, on the other hand, has evolved from its originally more comprehensive and artistic approach. It has shifted from the study of the patient, with all interconnected organs within specific social and environmental contexts, to the isolated study of different organs and to the study of micro cells and molecules. In other words, it has shifted the focus from the study of the patients within their social and psychological environment to the study of the disease.[6] As has been recognized by Engle (1977, p. 135), the biomedical model "leaves no room within its framework for the social, psychological, and behavioral dimensions of illness". Pauli and White (1998) suggest that the biomedical model would at best treat these dimensions as "risk factors" often placed outside of the domain of science.

Similar to neoclassical economics, biomedicine has abstracted diagnosis and treatment and consigned them to sophisticated technical manipulations. In this regard, Ornstein and Sobel (1999, p. 27) note that:

> *"Medical therapy consisted of physical and chemical interventions in the 'body machine', the way a garage mechanic would do a valve job on the family car. Disease was essentially a technical problem requiring technical solutions".*

Wade and Halligan (2004), attribute the limitations and the imperfections of the biomedical model in explaining many forms of the illness to its rather restrictive assumptions; that all illnesses have a single underlying cause. Under these circumstances, a disease (pathology) is always the single cause, and its removal will result into a return to good health. In addition, as contended in Engel (1977, p. 130), the biomedical model not only abstracts patients and diseases from their social contexts, "it also demands that

behavioral aberrations be explained on the basis of disordered somatic (biochemical or neurophysiological) processes". This dimension has, meanwhile, been critically analyzed with elaborate examples and cases within the sociology literature. The analysis is known as the medicalization and social control process, with an increasing number of social problems (like alcoholism, gambling, learning disabilities, and suicide) being defined, diagnosed and treated as medical problems (e.g., Conrad, 1992). This process has recently been more driven and controlled by commercial and market interests (pharmaceutical industry, consumers and managed care), than by medical professionals.

Along with these mutual shifts in the scope and interest of the analysis in both disciplines, a noteworthy drift has progressively become more evident. This drift is relevant to the respective ultimate goal for each of the two disciplines. Indeed, both conventional sciences' proclaimed goal is human well-being. However, in their applications and developments of the tools and means, they seem to have lost sight of their ultimate goal. Indeed, and with respect to medicine, in its shift from the patient to the disease, biomedicine has been focusing on the advancement of medical technology and intensive use and development of new drugs. The unprecedented applications of medical technology, though heavily advancing the medical industry profits, did not yield flawless medical care for human kind. While contributing to the advancement of diagnosis and treatments of many diseases, medical technologies have been associated with spiraling increases in health costs, hence limiting the number of insured and treated patients, widening the personal gap in the physician-patient relationship, and hindering other alternative safer forms of treatments.[7]

In their valuable book about the obsession with 'techno consumption', Deyo and Patrick (2005), confirm how the medical industry promotes and markets high cost medical technologies that are not adequately evaluated clinically, in terms of their effectiveness, hence resulting in marginal, at best, and sometimes harmful 'breakthroughs'. This view has also been recently supported by a new study that suggests that for-profit health-care industries may increase costs and reduce quality (Brezis & Wist, 2011). Similarly, a serious critique, both by the public and specialists, has also been directed to the utilization of expensive technology for artificial life-prolonging, which had only added to the suffering of the patient and to the emotional distress of the family (Hewa, 1994).

Furthermore, the emphasis on intensified use of drugs, hard-pressed by the pharmaceutical industry's fierce aim of increasing its sales and profit, has been associated with high costs and, more seriously, even fatal side effects at times. Much of the new and more expensive drugs, typically strongly promoted by the pharmaceutical industry and endorsed by credible scientific experts and research, are neither more effective nor safer than the older drugs they were replacing (e.g., Deyo & Patrick, 2005; Abramson, 2005). At present, a large number of cases of severe limitations and serious side effects of many drugs, in addition to cases of malpractice and fraud by many of the pharmaceutical companies, have all been well documented, (e.g., Angell, 2005; Moynihan & Cassels,

2005). In short, it is obvious that the ultimate goal of the medical science, as observed by Abramson (2005), has shifted from the concept of health as a 'public good' to a service whose prime motivation is to maximize financial returns.

Similarly, conventional economics gradually shifted its attention from its declared goal of human and social well-being to the never ending pursuit of the process of advancement of technologies and economic growth. Historically, humanity has pursued technological development and utilization to reduce the heavy physical toll of human work, and to allow humanity more leisure time for the same level of production. However, the accelerated technological advances, in particular in the second half of the last century, have led to higher levels of production, accelerated consumerism often financed by increasing debts, and more income inequality. A tendency towards 'jobless growth' has resulted from the heavier reliance of production processes on modern technology, corporate down-sizing and merging, and more recently by the flight of capital to lower cost countries in pursuit of higher returns.

This trend of what can be considered a zealous culture of endless growth represents arguably a significant challenge to the notion of "increased production for employment generation and increasing welfare". Time and again, the consequences of a growth of this category may include the making of unemployment (and not effective jobs). Or else, under some circumstances, the product of this pattern of growth is the creation of stressful jobs with adverse effects on health, as well established in the literature (e.g., Wilkinson & Marmot, 2003; Price et al., 2002; Spurgeon et al., 1997). Furthermore, much of the produced goods, e.g. arms, chemicals, tobacco, additives and chemical loaded food items, based on which the 'healthy' GDP growth indicators and profits are formed, are typically of harmful compositions and have fatal health consequences.[8] In addition, this type of growth pattern has been associated with a huge build-up of hazardous waste and environmental degradation, further boosting a number of severe diseases and aggravating both human and ecological health conditions.

The methodological limitations of conventional medicine and economics discussed above are naturally reflected within the cross field of health economics (Figure 1). Indeed, the narrow micro tools and monetary objectives are also applied to complex individual and social health issues. Similarly, the more developed biopsychosocial medical model, though less abstract than the biomedical model, reflects its mechanistic and fragmented tendency.[9] Fortunately, there are alternative approaches to both mainstream medicine and economics that have been receiving growing recognition. These differ in various respects including departure from the typical expansionist orientation of the two mainstream sciences. Some light will be shed on those alternative approaches in the following section.

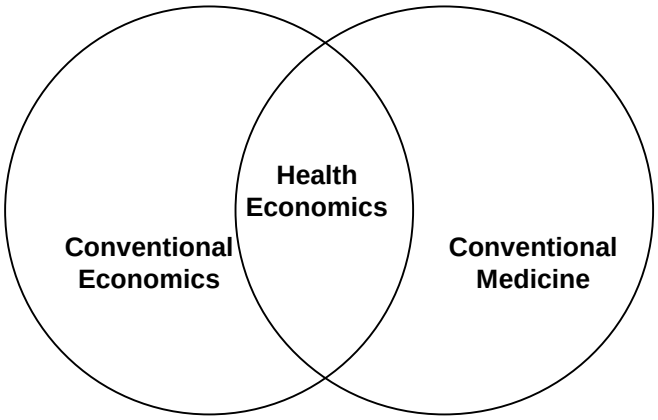

Figure 1. Health Economics: Cross-Field of Conventional Economics and Conventional Medicine

Integrative Approaches in the Sciences of Medicine and Economics

Two new paradigms or new 'cosmologies' have emerged in the respective fields of medicine and economics.[10] The new paradigms are trans-disciplinary, more intuitive and more humane- and ecologically-oriented. They have been receiving growing attention during the last few decades. These are commonly referred to as 'integrative medicine' and 'ecological economics'. Their mutual ground is illustrated in Figure 2.

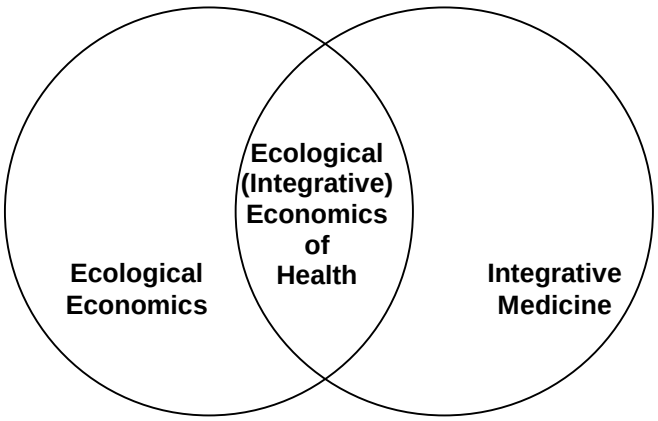

Figure 2. Ecological (Integrative) Economics of Health

Unlike the previous interference between conventional economics and medicine, this interference is viewed as a constructive one. This integrative approach incorporates a broad spectrum of shared interdependent issues, allowing for the investigations of different aspects of the biological, social, political, economic and ecological systems in their interactive relations with human health and well-being, as shown in Figure 3.

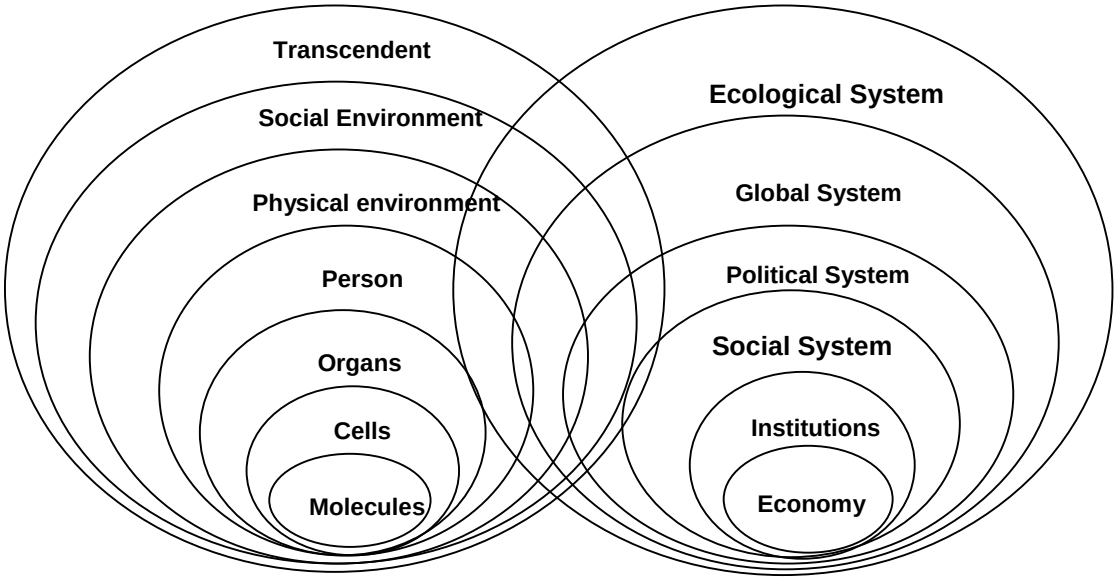

Figure 3. Domains of Research in the Cross-Field of Integrative (Ecological) Economics of Health (Source: Building on Figure 1 by Bell et al., 2002).

Both new approaches accord with ancient philosophies and the significant scientific developments of the 19th and 20th century, mainly in quantum physics, systems theory and holistic philosophy perspective, incorporating a more complex, dynamic and interdependent systems approach. Table 2 below summarizes some of the mutual methodological aspects between integrative medicine and ecological economics.

In relation to their ultimate objectives, both approaches oppose the huge expansion of the pharmaceutical and medical industry (among other industries contributing negatively to human and environment wellbeing). With respect to the technological dimension, both oppose environmentally insensitive technology application per se by emphasizing clean and safe technologies. More significantly, both adopt a more balanced and harmonious co-existence perspective with the natural environment.

***Table 2*. Parallels between Integrative Medicine and Ecological Economic**

Methodology & Philosophy	Integrative Medicine	Ecological Economics
Integrative & holism	Viewing people as a whole, stressing the unity of body, mind, spirit and the social, cultural, economic and environmental systems in which they live. In addition, disease is viewed as multifactorial and not hierarchical.	Viewing the economy as a subsystem of a complex web of social, political, cultural, institutional, global and ecological systems.
Dynamic	Viewing patients and medicine as dynamic and evolving entities. Hence, proposing different diagnosis and remedies with a combination of conventional, complementary and alternative medicine approaches.	Viewing the economy as a whole, as an evolving dynamic system. Proposing diversified polices for different contexts.
Research orientation	Adoption of both quantitative and qualitative tools within the philosophical view of system theory and holism.	Adoption of both quantitative and qualitative tools within the philosophical view of system theory and holism.
Objectivity	Recognizing that social values, views and orientation of the researcher do influence the choice of interest research and its health outcome. Medicine is a combination of science and art.	Economics is viewed as a normative, value conscious social science. Clear aim and policy recommendations are stated.
Ultimate objective	Wellness and healing of the whole person (physically, emotionally, and spiritually).	Human, social and ecological well-being.
Technology	Medical technology utilized within limits and in accordance with the ultimate objective of human well-being.	Limited necessary and safe technological utilization and in accordance with human and ecological well-being
Natural environment	Viewing nature as a system within which the human system exists. Emphasizing a balance and harmonious co-existence.	Viewing nature as a complex dynamic system within which the economy system exists. Emphasizing the utilization of renewable resources, clean energy and reduction of waste.

The focus of integrative medicine on health, wellness and healing, rather than on disease and sickness, incorporates the whole person within her/his social, cultural,

economic and environmental setting. Though the term 'integrative medicine' is often used in the literature with different meanings, Bell et al. (2002, p. 134) present a precise definition and a conceptual illustration, as shown in Figure 4 below:

> *"Integrative medicine represents a higher-order system of systems of care that emphasizes wellness and healing of the entire person (bio-psycho-socio-spiritual dimensions) as primary goals, drawing on both conventional and CAM approaches in the context of a supportive and effective physician-patient relationship*".

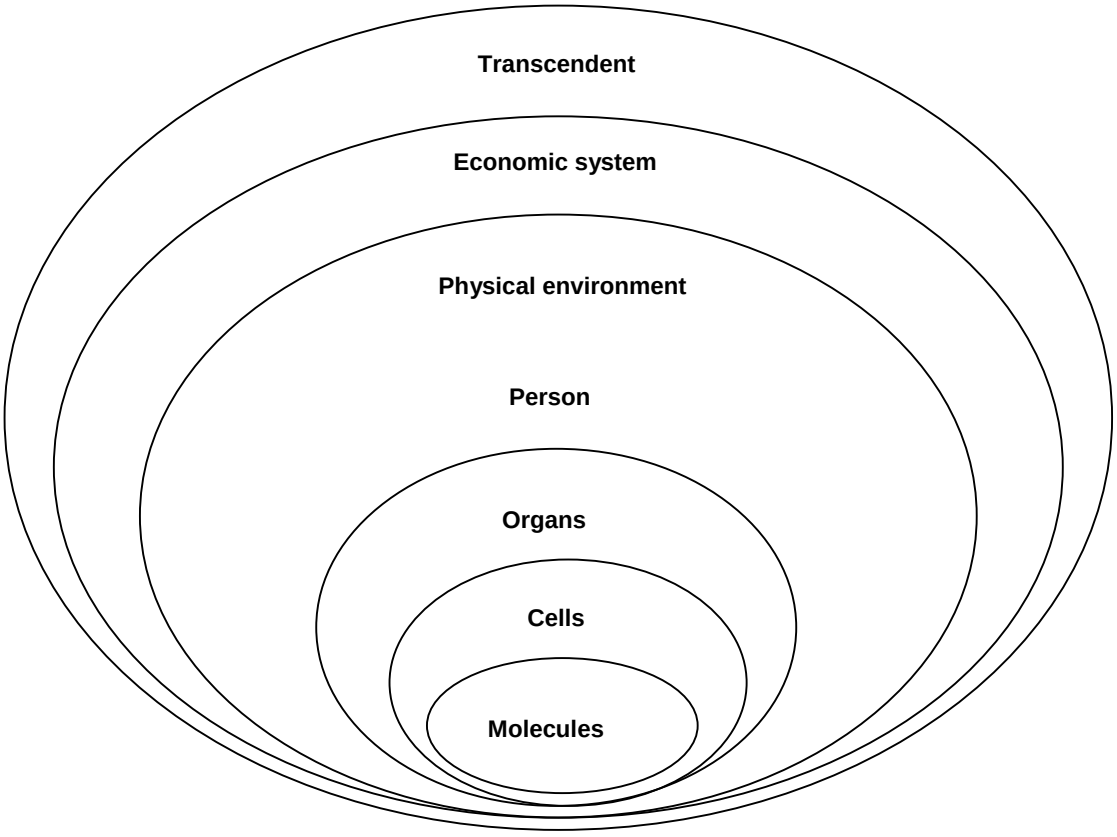

Figure 4. Domains for Research in Integrative Medicine [Source: Bell et al. (2002)].

Alarmed by the growing global consternation with the inadequacies of health services, and in their attempt to fill in the gap for the enhancement of new medical thinking, a small group of European and North American academics (the Berne Group) called for a new paradigm incorporating sociocultural, psychological and ecological aspects. In this regard, Pauli et al. (2000, p. 197) cite:

> *"The need to consider an ecological context of health, including all facets of communication, is part of the more general requirement to view phenomena as components of the systems into which they are integrated at a higher level of organization. At a somatic level, it will be difficult to understand the immune system without notion of the environmental (ecological) factors which determine its function. In the sociocultural domain, physicians cannot successfully care for patients of a cultural background different from their own without some familiarity with this culture".*

Integrative medicine extends its holistic philosophy to diagnosis and healing, incorporating both conventional, and complementary and alternative medicine (CAM).[11] Furthermore, integrative medical philosophy has re-incorporated the patient as a partner in the healing process, building on ancient belief. New and growing biological, medical, psychological, and neurological studies have supported the view of the human body's ability to be self-healing (e.g., Ornstein & Sobel, 1999), and individuals' abilities to alter their unhealthy life styles (e.g., Ornish, 1991; Sarno, 1999).[12]

This approach highlights the importance of the empowerment of people, health education, equitable access to primary care, and the role of preventive medicine. Therapists adopting integrative medicine practice may utilize drugs and technologies within limits, in the safest and simplest form, aiming not to simply alleviate symptoms, but to strengthen the body's immune system. This orientation is in accordance with the renowned critique of modern industrialized medicine by Illich (1974/2003, p. 921) who articulates that:

> *"That society which can reduce professional intervention to the minimum will provide the best conditions for health. The greater the potential for autonomous adaptation to self, to others, and to the environment, the less management of adaptation will be needed or tolerate".*

Many recent studies show that this approach of empowerment, education and preventive measures can produce better health outcomes and lower medical and economic costs (Fries et al., 1993, 1998).

Ecological economics, similarly, can be considered as integrative, as it is based on holistic philosophy and system theory approach. It views the economy as a subsystem of a complex web of social, political, cultural, institutional, global and ecological systems, as illustrated in Figure 5 below.

Ecological economics is fundamentally different from the branch of environmental and resource economics that views the environment from a conventional economic perspective. The latter focuses on efficiency evaluated in monetary terms in accordance with market mechanisms. This focus takes as given the underlying power structure and socio-political relations of income and wealth distribution. By contrast, ecological

economics views the economic system from a dynamic holistic ecological perspective, focusing on development with equity and sustainability, with an ultimate aim of enhancing human and social well-being. Sustainable development,[13] as opposed to sustainable growth, is viewed as a qualitative change towards improved functioning of the human, social and ecological systems. As cited in Dovers et al. (2003, p. 23):

> *"Ecological economists think it is important to sustain functioning social and ecological systems for the future of mankind. We accept that system have thresholds before they transform and limits before they crash. In a world of great and increasing inequity, we think justice is a central issue. And, yes, we are passionate about these shared working tenets".*

Clearly, unlike conventional economics that views accelerated economic growth as a means to increasing the wealth of nations, ecological economics views it as a process of diminishing existing wealth. In addition, this process with its accelerated technological application, especially in modern production systems, has not always led to reductions in costs, often replacing existing products with more expensive and less durable ones with 'cosmetic' changes.

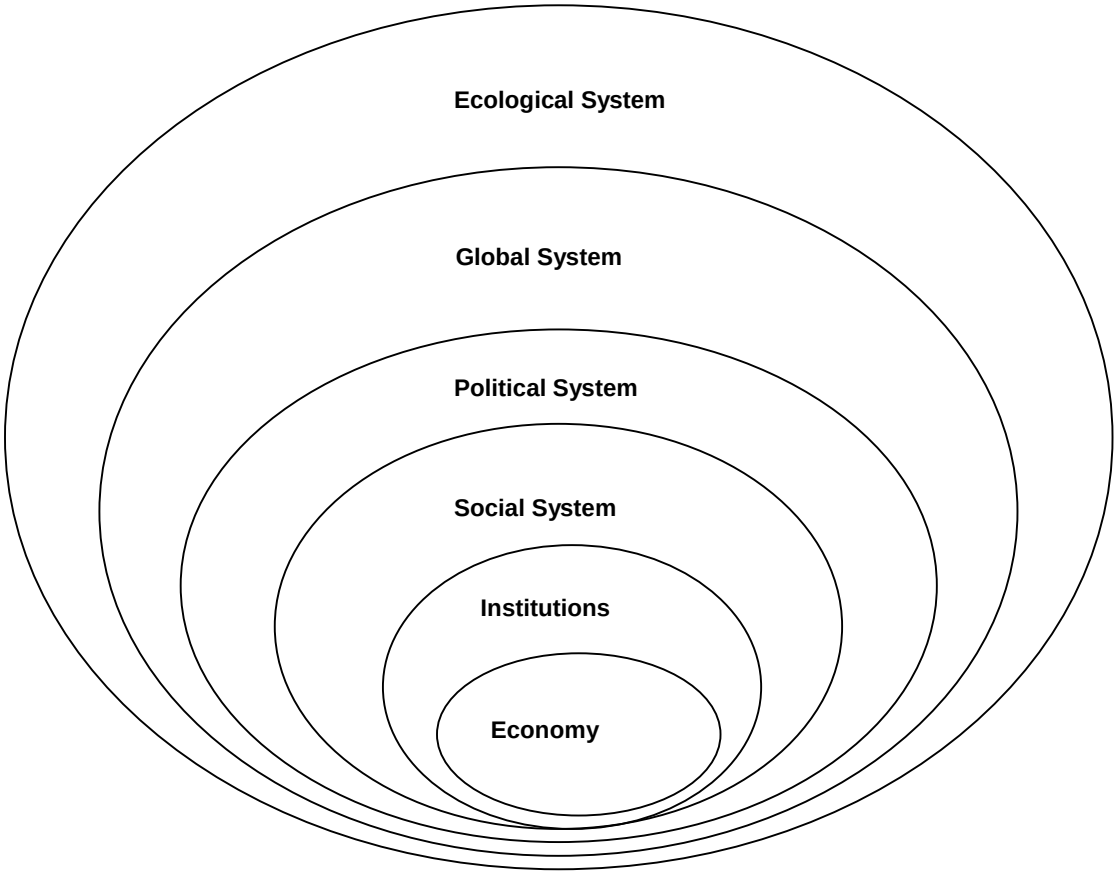

Figure 5. Domains for Research in Ecological Economics

Ecological economics may be viewed to be in conflict with actions intended to accelerate economic growth. It argues for its restraint along with a continued improvement of its content. It calls for the production of more durable products, elimination of all socially harmful production, especially military production, and the provision of socially needed goods and services such as education, health care, suitable housing, public transportation, healthy working environment, culture and art. In addition, ecological economics stresses clean energy, human and environmentally safe technologies, and the utilization of renewable resources.[14] These policy recommendations, together with more equitable income distribution and less working hours, are posited as means of generating more sustainable employment, income and well-being. Hence, human progress without economic growth (or de-growth) is possible (e.g., Schneider et al., 2010),[15] especially when ecological sustainability and social justice are viewed as fundamental objective values and as not subjective individual preferences (as argued in Daly, 2007). Furthermore, the reduction in wasteful and hazardous production and consumption will diminish resource depletion and waste accumulation, which in turn will result into diminishing environmental degradation and its negative impacts on health and well-being.

The new integrative perspectives in both medicine and economics are gaining increasing support from many of the more 'open minded' practitioners, academicians and researchers. A growing number of organizations and respected specialized journals are now embracing the new integrative orientation. Likewise, an increasing number of academic departments in different colleges and universities are now offering courses focusing on the new integrative perspectives as part of their curricula.[16]

Nevertheless, and despite the significant progress, the new integrative perspectives continue to be resisted by many conventional scientists, and even more fiercely by industries, particularly the large multinational corporations, with a vested interest in resisting change. Similarly, from the medical side, considering that high national economic product is devoted to health, the power of vested social, political and economic interests resist any effective assault on biomedical dogmatism. Indeed, as contended in Engel (1977), the trend continues to be for investment in diagnostic and therapeutic technologies to strongly favor approaches to clinical studies and care of patients that put emphasis on the "impersonal" and the "mechanical".

CONCLUSION

The analysis in this paper highlights that mainstream economics tends at times to view the economy in isolation of the political, social, cultural, historical and ecological contexts. Relatedly, many complex socio-economic, political, medical and technological factors continue to contribute to the current inadequacies of the health care system. The discussion in this paper has focused on only one factor related to the methodological and philosophical orientations of conventional medicine and economics, highlighting their

resemblance. Other factors that are equally important are related to the impacts of industries such as the pharmaceutical, food, beverages, tobacco, pesticides, and transportation industries that have contributed to unhealthy living styles and to polluting the environment. It is equally important not to discount the consequences of the privatization processes and the effects of accelerated globalization and recurrent economic crises on health policies, health status and human well-being in general.

Humans are complex beings, interacting in a complex dynamic socio-political-economic and ecological environment. These complex interactions, with their health related impacts and manifestations cannot be understood, diagnosed and healed through the static approach shared by conventional economics and medicine, nor through their cross-field of health economics. This approach has provided the rationale for the profit orientated material production, with its continuous depletion of resources and accumulated waste, increasing income and health inequality, consequently intensifying the deterioration of human and ecological well-being.

New integrative medicine programs are now being offered in a few universities where future physicians are taught broader aspects of health and healing that include behavioral medicine, nutritional medicine, botanical medicine, mind-body medicine, medicine and spirituality, medicine and culture, and the art of medicine. Centers offering integrative medicine programs are found in many medical schools.[17] Likewise, on the economic front, some reputed institutions are including in their academic programs an ecological perspective that embraces social, ethical, philosophical, biological and ecological dimensions.[18] However, the two integrative approaches continue to face significant opposition, even hostility, both at the academic level and by vested economic interests. In face of this resistance, a momentous effort is needed to expand the new orientation in educational programs, research institutions, policy forums, and public awareness. Professionals in the health care field and economists can make progress on this front by cooperating further with each other, and with scholars from other disciplines. Cooperation in relation to the new human and ecologically value-conscious integrative approaches provides them with a broad spectrum of shared interdependent issues. This cooperation can trigger a deeper holistic understanding of the issues and yield more effective human and social healing remedies in the long-run.

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Footnotes:

1. In view of this, the focus in our article will not be on any proclaimed parallels and salient similarities between economic research about medicine and the science of economics, as this would not be a worthy exercise given that the former falls within the realm of the latter. Rather, the investigation is on the parallels and salient similarities between the research about the science of economics and the research about the human body (the medical science).

2. It is important to realize that the focus on the similarities and shared aspects of the two fields does not rule out the existence of significant differences between them.

3. A more detailed critical presentation of the neoclassical economics paradigm and its Newtonian and Cartesian roots has been attempted elsewhere (Al-Rahmani, 1998).

4. Despite the apparent variations in the application of certain economic policies (such as increasing or lowering taxes, interest rates or government spending and changes in its budget), the frame of reference remains the same.

5. Further examples of such technical abstract policies are the manipulation of interest rates to control inflation and changes in the capital/labor ratios or population growth rate to boost economic growth and development.

6. This orientation has departed from the classical recommendation of the renowned physician and medical educator Sir William Osler's wisdom of giving the priority to knowing the patient before knowing the disease (Osler, 1932).

7. In his non-conventional approach, mainly by alterations in the patients' life style in healing heart disease, without the technologically advanced coronary bypass surgery, Ornish (1991) argues for the limitations of technological approaches that literally and figuratively bypassed the underlying causes of the problem.

8. For example, in the 20th century, approximately 100 million people died worldwide from tobacco-associated diseases (WHO, 2008).

9. For more elaboration of this point, see Armstrong (1987), and Greaves (2002).

10. Utilizing Kuhn's concept of a paradigm, where a new paradigm grows out of the limitation of the established one to solve new rising anomalies, and Greaves's concept of cosmology (Greaves, 2002).

11. There is now considerable evidence that different forms of CAM have been effective adjuncts to conventional medical treatment for a number of common clinical conditions (Astin et al., 2003).

12. New developments show that the brain's primary role is to heal the body and curb its pain, to enhance the immune system and regulate body's functions in response to outside factors (Ornstein & Sobel, 1999). Furthermore, many studies provide evidence for highly successful alterations in individuals' life style such as diets, exercise, psychological awareness and social and spiritual relations, in overcoming serious illnesses and improving well-being (Ornish, 1991; Sarno, 1999).

13. A new debate has recently developed about the difference or compatibility of the concept and orientation of "sustainable development" and that of "De- growth". In this article, we are only focusing on their compatibility (as in Martínez-Alier et al., 2010).

14. The utilization of renewable resources should be at a rate that does not exceed its regeneration rate and its emissions do not exceed the assimilative capacity of the local environment (Daly & Townsend, 1993).

15. The belief in the possibility of human and social progress without economic growth goes back to John Stewart Mill in the 19th century.

16. The first efforts to introduce a more holistic approach into the undergraduate medical curriculum actually date back to Adolph Meyer's program at Johns Hopkins, which was initiated before 1920 (Engel, 1977).

17. Examples of such schools include those at the Universities of Arizona, California, Connecticut, Maryland, Wisconsin, and at Harvard University.

18. As examples, integrative economic programs are now available at the Australian National University, Colombia University, University of Leeds, University of Edinburgh, Tokyo Institute of Technology, and at the Gund Institute affiliated with the University of Vermont.

REFERENCES

Abramson, J. (2005). *Overdosed America.* New York, NY: Harper Perennial.

Al-Rahmani, E. (1998). A critical reading of Neo-Classical Economics. *Journal of Social Sciences, 26*, 25-44.

Angell, M. (2005). *The truth about the drug companies.* New York, NY: Random House.

Armstrong, D. (1987). Theoretical tension in Biosychsocial Medicine. *Social Science Medicine, 25*, 1213-1218.

Astin, J., Shapiro, S., Eisenberg, D., & Forys, K. (2003). Mind-Body Medicine: State of the Science, Implications for Practice, *Journal American Board of Family Medicine, 16*(2), 131-147.

Bell, I. R., Caspi, O., Schwartz, G., Grant, K., Gaudet, T., & Rychener, A., (2002). Integrative Medicine and systemic outcomes research. *JAMA Internal Medicine (Formerly Archives of Internal Medicine, 162*, 133-662.

Brezis M., & Wist, W. (2011). Vulnerability of health to market forces. *Medical Care, 49*(3), 232-239.

Capra, F. (1983). *The turning point: Science, society and the rising culture*. London: Flamingo.

Conrad, P. (1992). Medicalization and social control", *Annual Revue Sociology, 18*, 209-232.

Daly, H. & Townsend, K. (Eds.). (1993). *Valuing the Earth: Economics, Ecology, and Ethics. Cambridg*e, Massachusetts: The MIT Press.

Daly, H. (2007), *Ecological Economics and Sustainable Development, Selected Essays of Herman Daly*. Edward Elgar, Cheltenham, UK - Northampton, MA, USA.

Deyo, R., & Patrick, D. (2005). *Hope or hype: The obsession with medical advances and the high cost of false promises*, New York: AMACOM.

Dovers, S., Stern, D., & Young, M. (Eds.). (2003). *New dimensions in ecological economics: Integrative approaches to people and nature*. Cheltenham: Edward Elgar.

Engel, G. (1977). The need for a new Medical model: A challenge for Biomedicine. *New Series, 196*(4286), 129-136.

Engel, G. (1992). How much longer must Medicine's Science be bound by a Seventeenth Century World view? *Family Systems Medicine, 10*(3), 333-346.

Fries, J., Koop, E., Beadle, C., Cooper, P., England, M., Greaves, R., Sokolov, J., & Wright, D. (1993). Reducing Health Care Costs by Reducing the Need and Demand for Medical Services, *New England Journal of Medicine, 329*, 321-325.

Fries, J., & McShane D. (1998). Reducing need and demand for medical services in high-risk persons, a health education approach. *Western Journal of Medicine 169*(4), 201-207.

Greaves, D. (2002). Reflections on a new medical cosmology**.** *Journal of Medical Ethics, 28*, 81-85.

Heilborner, R. (1953). *The Worldly Philosophers*, New York, NY: Simon and Schuster.

Hewa, S. (1994). Medical technology: A Pandora's box? *The Journal of Medical Humanities, 15*(3), 171-181.

Hewa, S. (1995). Specialists without spirit: Limitations of the mechanistic biomedical model. *Theoretical Medicine and Bioethics, 16*(2), 129-139.

Illich, I. (2003). Medical Nemesis. *Journal of Epidemiology and Community Health, 57*, 919-922. Retrieved from http://jech.bmj.com/content/57/12/919.full (Reprinted from 1974, *Lancet*, pp. 918-921)

Jacobzone, S. (2003). Ageing and the challenges of new technologies: Can OECD social and healthcare systems provide for the future? *Geneva Papers on Risk and Insurance, 28*(2), 254-275.

Korani, J. (1983). The health of nations: Reflections on the analogy between the Medical Science and Economics, *Kyklos*, *36*, 191-212.

Lazarou J., Pomeranz, B., & Corey P. (1998). Incidence of adverse drug reactions in hospitalized patients: a meta-analysis of prospective studies. *JAMA, 279*, 1200-1205.

Le Fanu, J. (2000). *The rise & fall of modern Medicine*. London: Abacus.

Leape, L. (2000). Institute of Medicine medical error figures are not exaggerated. *JAMA*, *284*(1), 95-97.

Martínez-Alier, J., Pascual, U., Vivien, F., & Zaccai, E. (2010). Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm. *Ecological Economics*, *69*, 1741–1747

Moynihan, R., & Cassels, A. (2005). *Selling Sickness*, New York, NY: Nation Books.

Ornish, D. (1991). *Reversing heart disease*. New York, NY: Ballantine Books.

Ornstein, R., & Sobel, D. (1999). *The healing brain: Breakthrough discoveries about how the brain keeps us healthy*. Cambridge, MA: Malor Books.

Osler, W. (1932). *Aequanimitas.* Toronto: McGraw-Hill.

Ostry, J., Berg, A., & Tsangarides, C. (2014). Redistribution, inequality, and growth, *IMF Staff Discussion Note*. Retrieved from http://www.imf.org/external/pubs/ft/sdn/2014/sdn1402.pdf

Pauli, H., & White, K. (1998). Scientific thinking, medical thinking and medical education: Questions derived from their evolution in the 20th century. *Human Resources for Health Development Journal (HRDJ), 2*(3), 155-182

Pauli, H., White, K. & McWhinne, I. (2000). Medical education, research, and scientific thinking in the 21st century, *Education for Health, 13*(2),173–186

Price, R., Choi, J., & Vinokur, A. (2002). Links in the chain of adversity following job loss: How financial strain and loss of personal control lead to depression, impaired functioning, and poor health. *Journal of Occupational Health Psychology, 7*(4), 302–312

Sarno, J. (1999). *The Mindbody Prescription*. New York, NY: Warner Books.

Schneider, F., Kallis, G., & Martinez-Alier, J. (2010). Crisis or opportunity? Economic degrowth for social equity and ecological sustainability. *Journal of Cleaner Production, 18*(6), 511–518

Spurgeon, A., Harrington, J., & Cooper, C. (1997). Health and safety problems associated with long working hours: A review of the current position. *Occupational and Environmental Medicine, 54*, 367-375

Starfield, B. (2000). Is US health really the best in the World? *JAMA*, *284*, 483-85

Taylor, R., & Rieger, A. (1985). Medicine as social science: Rudolf Virchow on the typhus epidemic in Upper Silesia. *International Journal of Health Services*, *15*(4), 547-59

Wade, D., & Halligan, P. (2004). Do biomedical models of illness make for good healthcare systems? *BMJ, 329*(7479), 1398–1401

United Nations (2013). *Human Development Report*. Retrieved from http://hdr.undp.org/sites/default/files/reports/14/hdr2013_en_complete.pdf

WHO (2008). *Report on the Global Tobacco Epidemic*. Retrieved from http://www.who.int/tobacco/mpower/mpower_report_full_2008.pdf

WHO (2006). *The world health report 2006: working together for health*. Retrieved from http://www.who.int/whr/2006/whr06_en.pdf

Wilkinson, R., & Marmot, M. (Eds.). (2003). *Social Determinants of health: The solid facts*. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0005/98438/e81384.pdf

AUTHOR INFORMATION:

Eqbal Al-Rahmani is an Associate Professor at the College of Business Administration, Kuwait University. She graduated with a Ph.D. degree in Economics from the University of New Hampshire, Durham, New Hampshire, USA. She previously served as the Head of the Economics Department at Kuwait University. She was a Post-Doctoral Fellow at the Johns Hopkins University, USA. Her main research interests include Population and Ecological Economics, and Economic Methodology. Address: Department of Economics, College of Business Administration, Kuwait University P. O. Box 5486, Safat 13055, KUWAIT. Email: eqbal@cba.edu.kw

Ali Arifa is the President of Box Hill College - Kuwait. He graduated with a Ph.D. degree from the University of Illinois at Urbana-Champaign, USA. He previously served at Kuwait University as a Faculty Member in the College of Business Administration, and at Lincoln University - New Zealand. He is a winner of several teaching awards. His primary areas of research are Economic Development and the Economics of Human Resources. Address: Box Hill College Kuwait, P. O. Box 29192 Safat 13152, KUWAIT. Email: a.arifa@bhck.edu.kw