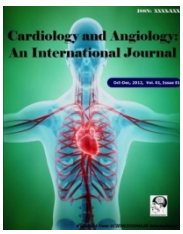

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The Adverse Effects of Wealth on Cardiovascular Health: A Scientific Statement of the International College of Cardiology

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Authors' contributions

This work was carried out in collaboration between all authors. Authors RBS, KH and RNM designed the hypothesis, wrote the protocol, and wrote the first draft of the manuscript. Authors VVM, SSR, TKB, ET, TT, JF, DP, FDM and DWW managed the literature searches, analyses of the study corrected and edited the MS and author MRM managed the review comments. All authors read and approved the final manuscript.

Review Article

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ABSTRACT

Background and Aims: Increase in economic status may be associated with increased consumption of Western type of foods and sedentary behaviour. In the present review, we discuss that increase in wealth may be associated with adverse effects on health behaviour.

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Study Design and Methods: Internet search and discussion with colleagues.
Results: Review of studies indicate that with increase in wealth, there is increased consumption of high fat, ready prepared foods and decrease in physical activity in most of the countries resulting in obesity and metabolic syndrome, leading to cardiovascular diseases (CVDs) and other chronic conditions. Many experts during the United Nations High Level Meeting in Sept 2011, misinterpreted the WHO estimates and proposed that, of total deaths, 22·4 million arise in the poorest countries, and 13.7 million in high-income and upper-middle-income countries and therefore poverty may be the major cause of deaths due to non-communicable diseases (NCDs). A recent study shows that 57.0 % of deaths in adults (aged 25-64 years) were due to CVDs and other chronic diseases, 25.5% due to communicable diseases and 15.9% due to injury and accidents. The deaths due to NCDs were highly prevalent among higher social classes compared to lower social classes who had greater deaths due to communicable diseases. It is interesting to know from new data from United States, that there is 'Wealth' without cardiovascular health in America. The whole world is likely to have the same scenario in the near future.
Conclusions: Increase in wealth may be associated with altered health behaviour; greater consumption of unhealthy foods, tobacco consumption, mental load and sedentary behaviour resulting in increased risk of deaths due to CVDs and other chronic diseases which may change with knowledge about health education. Wealth may cause extension in life by buying of expensive drug therapy, intervention and surgery which are known to add income and employment in the west.

Keywords: Deaths; diet and lifestyle; heart disease; non-communicable diseases.

1. INTRODUCTION

The United Nations High level Meeting (UN-HLM) in which health ministers and heads of all the member countries were invited was held in Sept 2011 in view of the very high death rates due to non-communicable diseases (NCDs) in the world [1]. All the governments of the member countries, made commitments to the prevention and control of NCDs in the Political Declaration from the UN-HLM on NCDs and pursue transition of national health care systems towards universal coverage [1,2]. The Political Declaration calls upon WHO to develop a comprehensive global monitoring framework to assess progress in the implementation of national strategies and plans for the prevention of cardiovascular diseases (CVD), diabetes, cancer, and chronic respiratory diseases (1-3).

This UN-HLM on deaths and disability due to NCDs, may invoke some controversies and policies, because basic causes of death and disability and discussion on existing health promotion policies in the developed countries, which are also followed by the developing countries, have been given only little consideration [4,5]. Millions of deaths occur every year due to lack of health education and poor health policies because people and populations living in poverty and therefore scant resources, have no opportunity for health education due to poor public health services [5-10]. The United Nation is represented by experts who follow the capitalist policies common in the developed countries which have already been unsuccessful in the prevention of CVDs and other chronic diseases [5-10]. United Nation is also emphasizing to achieve the Millennium Development Goals for reducing avoidable mortality due to NCDs by 25% by 2025 (the 25 by 25 goal) [1,2,11]. We understand that a valuable step forward, is a critique on the UN General Assembly's 2011 political declaration on the prevention of NCDs, because the obstacles in achieving this goal are great and largely un-discussed. In this viewpoint we emphasize that CVDs in particular and other

chronic diseases in general, do increase with increase in wealth which influences the way our health behaviour is regarding eating, exercising, tobacco consuming, and the way of living as well as to the accessibility and organization of health care by governments [3,4,12]. A further increase in wealth of a country and community appears to have only limited role in achieving knowledge about alteration in health behaviour and in the implementation of policy about health behaviour of the community.

2. VIEW POINT

In 2012, the UN conference on sustainable development, Rio+20, referred NCDs as "one of the major challenges for sustainable development in the 21st century" [2,11-13]. The UN emphasized the fundamental link between health and development which needs more comprehensive approach on development of health behaviour during transition from poverty to affluence. The costs of NCDs are increasingly a burden in low-income and middle-income countries, affecting people in the prime of their lives and putting more pressure on already stretched health systems and government and family budgets [1-3]. The WHO and UN have not been successful in the last five decades, to find out and emphasize, the underlying causes of increase in deaths due to NCDs, although communicable diseases are not fully controlled in most lower- and upper-middle- income countries [1-5].

There is a rapid increase in morbidity and mortality due to cardiovascular diseases (CVDs) and other chronic diseases [5-10]. Mortality and burden of disease estimates for WHO Member States in 2008 revealed that 36·1 million deaths per year occur as a result of non-communicable diseases (NCDs) which are mainly due to CVDs [5]. These estimates represent almost two out-of-three deaths per year worldwide. Approximately, two-thirds (63%) of premature deaths in adults (aged 15–69 years), and three-out-of-four of all adult deaths are attributable to NCDs. A recent study from India shows that 57.0 % of deaths in adults (aged 25-64 years) were due to NCDs, (including 31.0% due to CVDs), 25.5% due to communicable diseases, and 15.9% due to injury and accidents, indicating that these findings on deaths due to NCDs are similar to WHO estimates [4,5,8]. It is clear that the populations having lowest income had lowest prevalence of deaths and those having highest income had highest prevalence of deaths due to NCDs (Table 1). These data indicate that poverty as such does not appear to be the cause of NCDs.

However, some experts during the UN-HLM in Sept 2011, misinterpreted the WHO estimates and proposed that, of total deaths, 22·4 million arise in the poorest countries, and 13.7 million in high-income and upper-middle-income countries and therefore poverty may be the major cause of NCDs [1,5]. This appears to be a capitalist approach for assessment and management of NCDs because income differences in relation to health exist within countries.

The industrialization and urbanization contribute to high incomes for some social groups as well as poverty and income inequity for others, which results in low standards of general education and health education resulting in to unhealthy behaviour (3,4,8). With increase in socioeconomic status, there is unhealthy behaviour, characterized with; increased consumption of high fat, ready prepared foods, tobacco consumption and use of automobiles causing decrease in physical activity, and increase in occupational mental stress, in most of the countries. These lifestyle changes result in obesity and metabolic syndrome which appear to be leading causes of CVDs and other chronic diseases (Figs. 1 & 2) [3,4,8,14,15]. The contribution of the governments in the control of communicable diseases is significant but largely it may be a natural phenomenon, due to improvement in general health, nutrition

and immunity. These changes in the population health occur naturally, due to increased intake of energy, fruits, vegetables, fats and oils, and animal foods, as well as safe water and vaccinations, along with better economic status and better buying ability of the community. However, this natural transition may depend on health education and general education as well as on mental, social and the spiritual health of the community depending upon the public health policy.

Table 1. Causes of mortality due to broad causes of death according to income.

Income (US $)	n	Communicable Diseases	Noncommunicable Diseases	Injury-accidents
		Men, n (%)		
Rich (SES 1,2) (US$600 & above)	589	95(16.1)	485(82.3)**	50(8.5)
Moderate (SES 3) (US$300-599)	288	65(22.5)*	140(48.6)**	45(15.6)
Poor (SES 4,5) (US$<300)	508	212(41.7)**	141(27.7)	120(23.6)**
Total	1385	372(26.85)	766(55.30)	215(15.52)
Women, n (%)				
Rich (SES 1,2) US$600 & above)	305	40(13.1)	277(90.8)**	40(13.1)
Moderate (SES 3) (US$300-599)	170	44(25.8)**	130(76.5)**	42(24.7)*
Poor (SES 4,5) (US$<300)	362	110(30.4)**	95(26.2)	57(15.7)
Total	837	194(23.17)	502(59.97)	139(16.60)
Grand total	2222	566(25.47)*	1268(57.0)*	354(15.9)

SES=Socioeconomic status.=P<0.04, **P<0.001, by comparison of poor and rich and men and women. (modified from reference 8) Permission not required.*

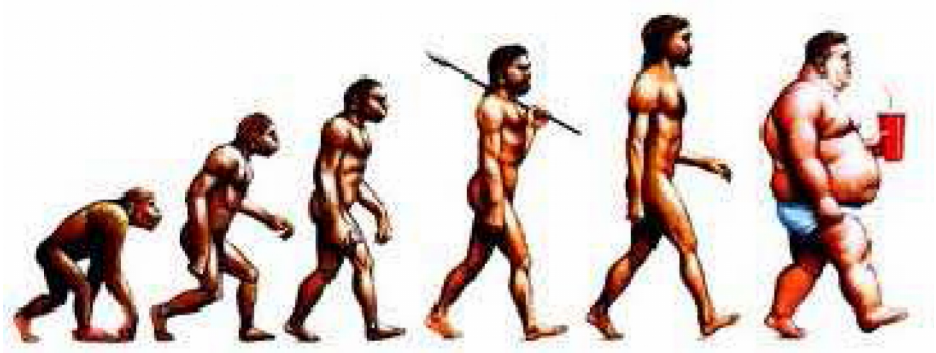

Fig. 1.Effects of diet and lifestyle on body composition from *Homo sapiens* to *Homo erectus* and modern man in indicating body mind index. (Fabien De Meester 2013)

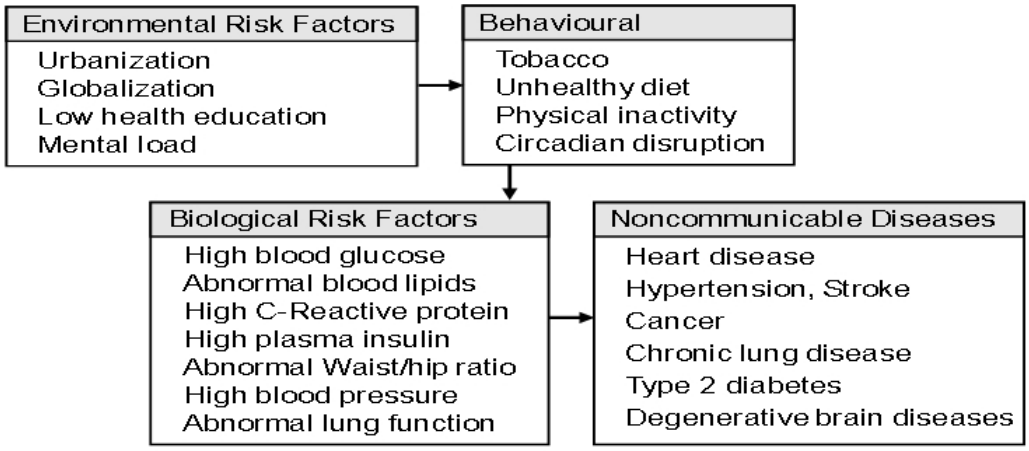

Fig. 2. Pathway for development of noncommunicable disease

In 1980s, Kerala State, India, maternal and child mortality rates and deaths due to diseases related to undernutrition, were lowest and life expectancy and literacy rates were as good as in developed countries but the people were not very wealthy compared to other states of India [8,14]. However, after 1990, with further increase in socio economic status, Kerala has the highest rates of obesity, hypertension and coronary artery disease and Type 2 diabetes [3,8,14,15].Nutrition in transition from *Homo sapiens to Homo economicus* also indicate that diet and life style changes appear to be important in the pathogenesis of CVDs (Figs. 1 & 2).

Table 2 indicates the effects of increase in income on development of health behaviour in developed and developing countries. It seems that NCDs develop along with alteration in health behaviour, due to economic development in the light of industrialization and urbanization [16-20]. The Five City Study has demonstrated that obesity and physical inactivity are significantly more common among higher social classes compared to lower social classes [17]. Similarly, hypertension and prehypertension were significantly more common among higher income groups than lower income groups in India [18]. The highest prevalence of cardiovascular risk factors and Type 2 diabetes have been observed in Trivandrum, Kerala, which occurred after further economic development in a relatively more educated population group compared to north India, east India and central India [17,18]. In developed countries, these problems are significantly more common among lower classes indicating that learning of health behaviour may have protected some of the higher social classes, against CVDs [16,19,20]. Hence during transition from lower social classes to higher social classes, learning of health behaviour; prudent diet, spare time physical activity, no tobacco, appear to be important for prevention of CVDs.

It seems that NCDs develop as a natural phenomenon of transition from poverty to affluence, due to ageing of population and increase in income, causing increased intake of ready prepared refined foods, use of automobiles and tobacco, due to lack of general and health education. In developed countries, a capitalist approach characterized with lack of public health policies on health promotion; more expensive prudent foods, inexpensive unhealthy foods, tobacco, alcohol, automobiles are major drivers for poor health behaviour leading to greater risk of NCDs, rather than poverty. The beneficial effects of wealth include; opportunity for buying expensive health foods, exercise in five star hotels, high cost drug and technological treatment which has a modest benefit on risk of death due to NCDs. Thus the

conclusions of the UN-HLM about poverty as the major cause of deaths due to NCDs appear to be biased, which would be further apparent from the health status in USA [6,7,9,10].

Table 2. Effect of increase in income on health behaviour and cause of deaths.

Data	High income countries		Low income countries	
	Rich	Poor	Rich	Poor
High fat western foods	++	++++	+++	+
Traditional foods	+	+	+	+++
Fruits, vegetables, legumes	++	-	++	+
Occupational activity	-	+	+	++++
Spare time activity	++	-	+	-
Tobacco	+	+++	+++	+++
Alcoholism	+	+++	++	++
Moderate alcohol	++	+	+	_
Psychosocial stress	++	+	++	+
Total health behaviour	++	+	+	++
Risk Factors	++	+++	+++	+
Deaths due to NCDs	++	+++	+++	+

NCD= Noncommunicable diseases. Based on reference 15-20, 24-28.
Symbols; - = none, + = little increase, ++=mild increase, +++= moderate increase, ++++= heavy increase.

3. CARDIOVASCULAR HEALTH IN UNITED STATES OF AMERICA

The epidemic of poor CV health behaviour continues to be common in USA, although yearly budget for health is quite high [6,7,9,10]. In a recent report of AHA [6,7], after adjustment, population attributable proportions for CVD mortality were as follows; for high blood pressure, 1: 40.6% (95% confidence interval [CI], 24.5–54.6); for smoking 13.7% (95% CI, 4.8–22.3); for unhealthy diet 13.2% (95% CI, 3.5–29.2); for sedentary behaviour 11.9% (95% CI, 1.3–22.3) for high glucose; 8.8% (95% CI, 2.1–15.4). Despite substantial budgets for health in United States for the last 4 decades of progress, in 2011, for ≥18 years of age, 21.3% of men and 16.7% of women continued to be cigarette smokers, and 18.1% of students in grades 9 through 12 reported current cigarette use. Regular physical activity is least common among youth less than 18 years and 32% of adults reported engaging in no aerobic leisure-time physical activity in 2011. Average total energy consumption among US adults increased by 22% in women (from 1542 to 1886 kcal/d) and by 10% in men (from 2450 to 2693 kcal/d). Between 1971 and 2004, an estimated 31.9 million adults ≥20 years of age had total serum cholesterol levels ≥240 mg/dL, with a prevalence of 13.8%. The prevalence of hypertension, based on 2007 to 2010 data, was observed among 33.0% of US adult's ≥20 years of age which represents 78 million US adults with hypertension, equal between men and women. African American adults have among the highest prevalence of hypertension (44%) in the world. Among hypertensive adults, ≈82% are aware of their condition and 75% are using antihypertensive medication, but only 53% of those with documented hypertension have their blood pressures controlled to target levels. Type 2 diabetes in 2010, was estimated to be 19.7 million Americans representing, 8.3% of the adult population. Undiagnosed diabetes mellitus was noted among an additional 8.2 million, and 38.2% had pre-diabetes. A disproportionate burden of diabetes mellitus was reported among African Americans, Mexican Americans, Hispanic/ Latino individuals, and other ethnic minorities in the United States, which is increasing dramatically over time, in parallel with the increases in prevalence of overweight and obesity. It is clear that people in United States,

have wealth but no health as reported in the Lancet, which may be due to wrong public health policies causing wrong health behaviour [9,10].

In the United States, rates of death attributable to CVDs, have declined, but the burden of disease remains quite high [6,7,9,10]. The 2009 overall rate of death attributable to CVD was 236.1 per 100 000. Recent data indicate that death rates were 281.4 per 100 000 for white males, 387.0 per 100 000 for black males, 190.4 per 100 000 for white females, and 267.9 per 100 000 for black females [6,7]. The relative rate of death attributable to CVDs have decreased by 32.7%. However, in 2009, CVDs still accounted for 32.3% (787 931) of all 2 437 163 deaths, in the United States. The toll is 2150 subjects, who die of CVD each day and about 153 000 subjects who died of CVD in 2009 were <65 years of age. In 2009, 34% of deaths attributable to CVD occurred before the age of 75 years, which is well before the average life expectancy of 78.5 years. Further studies indicate that CAD alone caused about 1 of every 6 deaths in that year, and 386 324 Americans died of CAD [6,7]. Approximately every 34 seconds, 1 coronary event, and approximately every 1 minute, 1 coronary death is found in USA. Each year, an estimated 635 000 persons have a new coronary attack (defined as first hospitalized myocardial infarction or CAD) and 280 000 have a recurrent attack. It is estimated that an additional 150 000 silent first myocardial infarctions occur each year. The relative rate of stroke death declined by 36.9% and the actual number of stroke deaths declined by 23.0%. In 2009, stroke caused about 1 of every 19 deaths in the United States. On average, every 40 seconds, someone in the United States has a stroke and dies of one approximately every 4 minutes. However, each year, 795 000 of people continue to experience a new or recurrent stroke (ischemic or hemorrhagic). Approximately 610 000 of these are first attacks, and 185 000 are recurrent attacks. The deaths and disability due to heart failure are also quite high in the USA. The hospital discharges for heart failure remained essentially unchanged from 2000 to 2010 in USA, with first-listed discharges of 1, 008 000 and 1, 023 000, respectively. In 2009, 1 in 9 death certificates (274 601 deaths) in the USA, mentioned heart failure and it was the underlying cause in 56 410 of those deaths in 2009. The number of any-mentioned deaths attributable to heart failure was approximately as high in 1995 (287 000) as it was in 2009 (275 000).

Above studies further support the view that wealth alone cannot prevent and decrease the risk of deaths due to CVDs. After its victory in the World War II, the United States made tremendous progress in the last 4 decades, in science, industry and socioeconomic conditions, leading to eradication of communicable diseases and good physical health at the cost of poor social, mental and spiritual health. There was a race in the whole world to follow the United States, in developing nuclear weaponry and industry, even in lower middle income countries like China and India who made the nuclear bombs and associated weaponry despite poverty and ignorance among one third of its population. The budget for health expenditure in India and China remained one third of that in United States, which created over-confidence among policy makers, as if money can provide much better health than a good public health policy. Apart from warheads, people and politicians all over the world follow the United States in every other aspect; including industrialization as well as in the methods of urbanization, Hollywood films, fashion and foods whatever it may be. The world would be grateful if the US comes forward and creates a model in total health including; physical, social, mental and spiritual wellbeing, because the USA continues to be the best in research in all these areas.

The health budget in USA was US$2·7 trillion in 2011, which is $8700 for every person in the country, and represents 17·9% of the economy, that is far greater than any other economically advanced country [9,10].Unfortunately, recently, the American people, health-

care workers, and policy makers received shocking news which became world news [9,10]. It was interesting to note that despite spending more on health care per person than other high-income countries, many people in United States, die sooner, are least likely to reach the age of 50 years, and have higher rates of disease or injury. Unfortunately, Americans are less healthy from birth to 75 years of age than people in 16 other economically wealthy countries, if judged by health alone. This health disadvantage has been getting worse for 30 years, especially among women, as disclosed in a report released on Jan 9th from the US National Research Council and Institute of Medicine [10]. This report compared comprehensive mortality and morbidity data from USA with affluent democratic countries; Australia, Canada, France, Italy, most of the Nordic countries, Spain, and the UK. Life expectancy is shorter at birth for American men than for men in any of the other 16 countries, and American women fare little better. Surprisingly, Denmark is the only country that has a lower life expectancy for women at birth. In nine key areas of health; infant mortality and low birth weight; injuries and homicides; teenage pregnancies and sexually transmitted infections; HIV/AIDS prevalence; drug-related deaths; obesity and diabetes; heart disease; chronic lung disease; and disability, the United States fares least well, or is near the bottom of the tables. This health disadvantage in the United States, applies to those with health insurance, a college education, higher incomes as well as to those without, indicating again that wealth has limited impact on risk of deaths due to CVDs. Unfortunately or fortunately, we share the same views [8] and reported that poverty is not the absolute cause of deaths due to non-communicable diseases (NCDs). This seminal work was rejected by several leading journals because the referees may have presumed that whatever is concluded in the United Nations High level Meeting (UN-HLM), is final and Singh and co-workers have only a small voice with which to criticize it [4,5]. But “Satya Mev Jaytey (in Sanskrit)” or truth always wins [8]. Surprisingly, WHO is party to conclusions made at UN-HLM without any serious objections. We must share our views with policy makers that the United States may not be in a correct direction regarding social, mental and spiritual health as well as about physical health of the people and populations and needs suggestions from other countries and international experts. Nuclear bomb can protect and prevent wars and injury, as in case of India and Pakistan but cannot be a good example of prosperity to follow for providing better health, particularly better social, mental and spiritual health [6-10]. Many affluent countries such as Australia, Canada, Nordic countries, Spain, *etc* are not in the nuclear family, but are not inclined to consider health as a business but, a service to people by having better public health policies. Unfortunately, these countries are not in a position to provide health care policy to the USA but experts from these countries and other bodies can raise such issues in future UN-HLMs to achieve MDGs.

Many affluent countries in the various regions have increasingly seen inequities in people's life conditions and declining social mobility and social cohesion resulting in unhealthy diet, occupational stress and sedentary behaviour leading to poor total health [3-10]. Progress can be made in reducing health inequities based on global evidence and recommended policies and the health divide across all countries, including those with low incomes [3,8,13-15]. The objective should be to find out the social determinants of health, across the life course, and in wider social and economic spheres, to achieve greater health equity and protect future generations [5-15].

Iglehart [21] mentioned the Affordable Care Act (ACA) of the United States, which appears to be a practical approach to deliver health education on prevention. However, this approach is also open to bias as a capitalist approach via insurers, but it is good to provide funds for technological therapies as well as health education on physical activity, cessation of tobacco use, and alcoholism. However this does not treat the cause of the lack of health behaviour

and provide affordable tasty and convenient prudent foods in place of big inexpensive unhealthy foods, for prevention [16]. The current smoking rates are low in United States, which should lead to future health benefits [9,10]. However, it is not necessary that a relatively high household income would also decrease the risk of deaths due to stroke and cancer, although, Americans who reach 75 years live longer than their peers in other countries, because health insurers can extend their life due to affordable health services.

It seems that spending on health care, bears little relation to good health. It is not clear, why it is that people in United States and many other developed countries are at a health disadvantage compared with those in other countries? It is possible, that the fragmented health-care system, and in particular, poor access to health care and to primary care related to health behaviours, are partly to blame. Apart from these factors, social, mental and spiritual health in most developed countries appears to be too poor to support physical health. Increased consumption of energy rich ready-prepared fast foods rich in refined carbohydrates, trans fat, saturated fat and low in w-3 and monounsaturated fat, overeating, physical inactivity, stress, tobacco, drinking and driving, drug abuse, and other risk-taking activities such as not wearing motorcycle helmets and using firearms, increase the risk of NCDs in most of the countries [3-10,16]. Lack of insurance, or inadequate insurance, restricts access to health care for many populations in the world, but this health system is not the only problem. Unhealthy behaviours that abound in the world are particularly important which worsen due to poor health policies of the governments. There is a need for health department of government to better collaborate with other departments of the government; agriculture and foods, human resource development, housing, sports to plan their activities around providing health behaviour to provide better health. In most developed countries, cities are planned by the businessmen who prefer business rather than health and often built the cities around automobile use, which discourages physical activity and contributes to obesity. The first step is to implement the way of thinking of the planners involved in the prevention strategy of any country. In the United States, for people over 50 years, preventing CVDs through, the Million Hearts Campaign is key but it is important to consider by *heart* than by *mind* trained for business development. United States planners are limited to help only those under 50 years, preventing injury and deaths in road traffic accidents or by guns, and HIV prevention and treatment, and consider them important targets. The Millennium Development Goals (MDGs) [22], by focusing global communities on a common agenda, also confirmed that progress for poor and marginalised people is possible. However, MDG ignored the central role of health systems and overlooked the emerging health concerns such as NCDs, and contributed to inequities in health by focusing on final health outcomes related to vertical programs rather than on building integrated health systems. The passage of a UN General Assembly resolution on universal health coverage (UHC) in December, 2012, underlines how the UHC is becoming a key global health objective [23]. This resolution sets the stage for the UHC to become a unifying central health goal in the post-2015 MDG framework but it is not clear how it would make the people health educated to change health behaviour during transition from *Homo sapiens to Homo economicus* [24].

4. EUROPEAN UNION AGENDA

It is good to find out social determinants of health to plan health education by an integrated approach in all of the 52 countries in the European Union (EU) [19-21]. In the EU, 80% deaths occur due to NCDs including 60-65% due to CVDs [5,25]. The European countries have witnessed remarkable health gains in those populations which have experienced progressive improvements in the conditions in which people are born, grow, live and work.

Despite better health in France, Italy and Nordic countries, inequities, both between and within countries, across 52 Member States of the WHO European region persist [25]. The EU is now in a better position to understand about the extent and social causes of these inequities. The EU has commissioned to support the development of the new health policy framework for Europe: Health 2020, because these experts believe that the Western world is not always correct, particularly for matters related to health. The focus of the EU is on the global evidence regarding socioeconomic policy related determinants of health across the life course and recommends policies, to ensure that progress can be made in reducing health inequities and health divide across all countries of the world. The EU is collaborating with Health Canada, India, China and many other countries, to develop global health agenda including healthy foods, for providing better health. The United Nations is ready to play central role for all countries; including those with low incomes across the world, to achieve greater health equity and protect future generations by encouraging Member States to plan, pursue, transition of national health care systems towards universal coverage [23]. However, it is not clear, how food security would be achieved in the Third World countries in a way that they do not suffer the epidemic of NCDs during transition from poverty to affluence [24]. The challenge would be, how to develop "Functional Food Security" and inexpensive spare time and occupational physical activity across the whole, 'no tobacco', world for prevention of NCDs.

5. INTERNATIONAL COLLEGE OF CARDIOLOGY (ICC)

The ICC reiterate the above mentioned efforts and challenges, which may not be the final, because primarily, we should target health behaviour and health education about prevention to address all the 4 components of total health as emphasized by the International College of Cardiology and International College of Nutrition [26]. This includes prevention of deaths due to injury as well as improvement in social, mental and spiritual health which appear to be least known to people and experts in the West. Various social markers of health and wealth can influence the levels of health behaviour; physical inactivity, dietary patterns, salt intake, alcohol consumption and tobacco use and stress which are important in the pathogenesis of CVDs (Fig. 2, Table 2) [26-28]. Big food and big systems have become common in wealthy countries which are being followed in the developing countries resulting in to increased risk of CVDs [16,26]. Effective control of NCDs requires a comprehensive approach. There is a need to collaborate the department of agriculture, food and nutrition, department of education and department of sports and transport and housing in every country to make a health promotion policy so that students right from play schools to postgraduate colleges as well as citizens working in offices or factories, can have the opportunity to get slowly absorbed, micronutrient dense, w-3 fatty acid rich, ready prepared functional foods, cola drinks/fruit juice as well as fresh foods and spare time physical activity at affordable cost. A public health policy providing tax relief to food industry, farmers growing health foods (fruits, vegetables, seeds and nuts and herbs), food departmental stores and public/private health promotion centers; gymnasiums, yoga and meditation centers, parks and foot paths for cycling and walking may be great steps in a no tobacco world for prevention of NCDs. There is a need to develop more concentrated flavonoid rich wines, like Chinese wines, to avoid the use of alcohol rich sprits. These efforts should be started also in the Third World and lower middle income countries, apart from the developed countries.

The care or management for NCDs is a global problem, hence Pan American Health Organization has taken new steps to prevent NCDs (http://new.paho.org /hq/index. php?option=com_content) which needs further modifications. Research demonstrates that the vast majority need a model of health care that could deliver integrated management of

NCDs within the context of primary health care, and provides practical guidance for health care program managers, policy-makers, and stakeholders on how to plan and deliver high-quality services for people with NCDs. Enacting policies and programs related to food, agriculture, affecting production, trade, manufacturing, labeling, public-private partnerships, taxes and subsidies may be useful. The emerging and dynamic consumer market for healthier food options should be encouraged. Public policies can support consumers in making good nutrition decisions and reduce future health care expenditures in the process. Reductions in salt and replacement of trans fat with polyunsaturated fat are among WHO best buys but there should be greater emphasis on slowly absorbed, w-3 fatty acids and flavonoid rich diet. Such interventions could also contribute to development goals; improving maternal health, by reducing conditions such as diabetes and hypertension in pregnancy. For increasing activity, urban planning can increase access to rapid mass transit and safe cycling and walking paths. For example, the use of Transmilenio, rapid mass transit in Santiago, Chile, has been shown to increase the chance of walking for more than 30 minutes a day by 70 percent. Active transport can help to reduce fuel emissions, air pollution, and dependence on fuel, with benefits for climate change, the environment, and energy security. Such benefits would also address Millennium Development Goals: ensuring environmental sustainability. The education sector can create healthy school environments, providing safe spaces for physical activity and offering nutritious foods to students. In Brazil, 30 percent of national funds for the school meal program are used to acquire local produce, supporting local farms. By preventing childhood obesity, such programs would also contribute to achieving development goals, improving child health. Recently, health behaviour have been found to be important in the pathogenesis of NCDs in all countries, more in wealthy than in poor countries [27,28]. Now China has become a upper middle income countries from its lower middle income status with rapid increase in deaths due to NCDs [29].

Some experts (FD) from EU have proposed “Mind, Body Index= BMI” to address total health because physical, social, mental and spiritual health may depend on body composition. It is remarkable that animals including man in the wild do not suffer overweight but *Homo economicus* (Fig. 2) do suffer [24]. In contrast, companion pets may and societal man does. The human part – the mind – appears responsible for the disease because of poor mental and spiritual health. It is important to analyze facts as primary and secondary risk factors. Food is here secondary. It contributes, yet not causes the problem. Just as cholesterol contributes, but not the causes heart disease. (www.columbus-concept.com). Once understood and accepted, such basic principle allows one to take the right decision about prevention of CVDs and other chronic diseases.

6. CONCLUSION

In brief, health education about learning and practice of health behavior; prudent diet, moderate physical activity, no tobacco, low psychosocial stress as a public health policy at affordable cost, rather than wealth, appear to be important in the prevention of CVDs and other chronic diseases.

CONSENT

Not applicable.

ETHICAL APPROVAL

Not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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