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Economic Growth, Obesity and Global Burden of Disease: An Exploration

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Abstract: In recent years, obesity has increased in the emerging economies to a level. Economic growth plays an important role in increasing the obesity in a country. The present study is an attempt to examine the effect of economic growth in the increasing obesity and its relationship with global burden of disease. To carry out this study different regions are taken like south Asia, Latin America and Caribbean, Europe and central Asia, North Africa and Middle east and Sub Saharan African. Economic performance is measured through GDP. Obesity is measured through the calories intake per day by a person in these regions. Total health spending, out of pocket spendings share of health spending, development assistance as share of total health spending, diabetes and hypertension are included as variables. To examine the relationship, graphs of all these variable are made and comparison has been done for these regions. The results show that GDP growth or economic growth has a significant impact in increasing ratio of obesity. As economic growth increases, per capita income of people also increases. People have more money to spend on food and their food shift from low calories to high calories. Excess of calories changes into fat by the body and then this fat converted into obesity. Due to obesity different diseases create like diabetes and hypertension due to which mortality rate also increases. So obesity is also a cause of increasing the global burden of diseases. Furthermore, it has been suggested that the government of these regions should encourages the people by teaching them about obesity in institutions.

Keywords: Obesity, Food, Disease, Economic Growth, Health
JEL Classification: I18, O40, L66

1. Introduction

Human and planetary wellbeing and additionally monetary development are immovably interlinked and subject to complex cooperation impacts. In this study we give a review of interlinkages between economic growth and obesity through its impact on global burden of disease. Obesity is a medicinal condition which is because of abundance of fat. Because of abundance of fat, individuals contracted by various maladies which may

abandon them to have a lower standard of health. Individuals are by and large viewed as hefty when their body mass is more than 30 kg/m2.

Individuals inside the range of 25–30 kg/m2 depicted as overweight. Heftiness has achieved plague degrees universally, with more than 1 billion grown-ups overweight and more than 300 million of them are clinically obese and is the significant supporter of the worldwide weight of malady. The real ailments which expanded by corpulence are hypertension, diabetes, different sort of cancers.

Simon Kuznets' (1955) theory that as a nation builds up, a natural cycle creates where disparity initially expands then decrease has turned out to be known as the Kuznets curve. This concept can be related with health Kuznets curve which is an inverted U-shaped pattern between economic growth and income related health inequalities. As economic development occur, health inequalities increases first then decrease. As GDP of a country increase, people will have more money to spend and consume more calories due to which obesity rates increase. However as income continuously rising, health become more important for the people and they decrease their obesity level. A group of researchers showed that when emerging trends such as a rise in obesity rates at all ages, are taken in account, forecasts of future life expectancy is lower than they would have been otherwise. Obesity is more in developed countries but now the trend of obesity spread along the worldwide.

Obesity has a diverse effect on the economy of a country. High developed countries have more obese people than developing countries. The key causes are associated with expanded utilization of energy dense food with high level of fat and reduce physical activities. High calorie food is not the only factor which make the people of a developed country obese. Lots of thing responsible to make people obese. Researchers tries to show that the effect of technology like TV and computers screens. The statistics shows that every 10 % increase in a country spend on technology give 1% rise to the obesity.

A country with most of obese people pay different type of costs like health cost, productivity cost and transportation cost. Due to obesity people caught by different type of diseases and government expenditures increases on health sector which is burden on the economy because many

other sector may deprive from their share of money and this bad for an economy. The writing around there incorporates investigations of the total productivity loss because of obesity, and also gauges for a few particular sub-classes of efficiency costs. People did not work with their full efficiency due to obesity and produce less which is a direct cost paid by economy. So economy of a country may fall down.

Notwithstanding its effect on restorative spending and productivity, obesity may influence transportation costs. Increments in body weight among Americans imply that more fuel and bigger vehicles are expected to transport a similar number of suburbanites and voyagers every year. This delivers an immediate cost and additionally potential aberrant expenses as more noteworthy ozone harming substance discharges. Obesity rates in developing countries are low but now a days increases due to the cultural changes. Urbanization phenomena is also linked with obesity in the sense that it will change the environment and the most important diet of the people and this phenomena is more in developing countries. Obesity increases in developing countries but not more than developed countries. As economy of a country effected as obesity increases so both are interlinked.

The issue of obesity can be overcome if people avoid to take sugar and refined carbohydrates and by using more fruits, vegetables, nuts and whole grains. People must do exercise at least 30 mint in a day and use vegetables base instead of animal based fats. Economic performances can be increased by lowering the obesity.

1.1 Problem Statement

The economy and obesity are interlinked with each other. Obesity has increased drastically over the past few years which has poses serious implications on economy. Indicators like health, productivity and GDP plays a significant role in assessing the burden of obesity in the economy of a country. Developed countries are more victim of obesity but now a day due to cultural change and urbanization in the sense that it will change the environment and the most important diet of the people. So this study is designed to examine the impact of obesity on economic growth in developed countries and developing countries. Does economic growth impact the body mass? How obesity is related with global burden of disease?

1.2 Objectives of the Study

The study has the following main objectives:

1) To examine the impact of economic growth on calories intake per day
2) To assess the impact of obesity on global burden of disease

1.3 Significance of the Study

In this study the impact of obesity in the economy and comparison of obesity in developed and developing country is analyzed. It is sensible to portray obesity as a general health disaster that seriously weakens the health and personal satisfaction of individuals and adds impressively to national medicinal services spending plans. Due to obesity economy produce low but pay a direct cost in the form of treatment of diseases produced by obesity which is a burden on the economy. This study will help the government to design polices which are most suitable according to need to prevent obesity.

1.4 Limitations

The present study started the data collection process including the developed and developing countries but excluded missing values for some countries therefore, the data was trimmed. This study includes the data of different regions like South Asia, Sub Saharan Africa, North Africa and Middle East, Latin America and Caribbean and Europe and Central Asia. It has limitation of data availability on obesity for some countries.

1.5 Organization

The remaining part of the study is divided into various sections as: chapter 2 presents a review of the literature and related research linked with the problem presented in the study. Chapter 3 provides a theoretical framework of the study. Chapter 4 explains methodology. Chapter 5 consists on the presentation of the outcomes. Chapter 6 presents a summary and discussion of the researcher's conclusion and suggestions for practice.

2. Literature Review

Samanic, et al. (2003) investigated the obesity and disease hazard among white and dark United States veterans. To decide if corpulence related tumor dangers varied essentially amongst white and dark men, it is discovered that heterogeneity is a hazard for every malignancy site by including a communication term for weight. Results demonstrated that dangers were fundamentally raised for a few diseases among white and dark veterans. Corpulent men are at expanded danger of real malignancies.

Barid, et al. (2005) attempted to study the relationship between growth and subsequent obesity and to determine if any association has been stable over time. Search are done about studies that described the relation between aspect of infant size and the obesity at any later stage. Result shows infants who are at the highest end of the distribution for body mass index or who grow rapidly during infancy are at increased risk of obesity.

Pickett, et al. (2005) endeavored to discover if there exist any connection amongst obesity and day by day calorie intake with salary imbalance among created nations. Top 21 created nations having information on salary disparities and obesity would be examined. The outcome demonstrated weight, diabetes, mortality and calorie utilization were related with salary imbalance in created nations. Expanded nourishing issues might be a result of the psychosocial effect of living in a more various leveled society.

Asfaw (2006) examined the impact of obesity on specialist diagnosed ceaseless ailments in Africa. Information in this examination from 2002 world health review supported by the world health organization was utilized. Multivariate fidelity investigation was performed. The outcome demonstrated that corpulent people were at a higher danger of detailing diagnosed unending ailment especially coronary illness in South Africa than non-hefty partners.

Olsen, et al. (2006) tried to investigate the birth cohort effect on the obesity epidemic in Denmark in the prevalence of obesity among boys and young men. Trends in the prevalence of obesity from 1930 through 1999 expressing time as the subject year of measurement and as year of birth was examined. The result showed trends in the prevalence of obesity were similar in boys and young men only when expressed by year of birth which suggests that early life may be a period for developing obesity.

Riemenschneider, et al. (2008) analyzed cost estimates and compare cost attributes to obesity across different European countries. A search in MEDLINE, EMBAS and EBM reviews was conducted to identify relevant literature. The result showed that overweight and obesity are responsible for a substantial economic burden in Europe. Rapidly growing prevalence of over nutrition in industrialized nations, further increase in cost is expected.

Gultekin, et al. (2009) examined the prevalence and patterns of adult obesity in Turkey and discuss the impact of socio environmental factors. A cross sectional nationwide survey was conducted on 2100 adults including males and females. The results showed that obesity was more remarkable among females than males. Logistic regression analysis showed that older age level among males and females have impact on obesity.

Musaiger (2011) attempted to investigate the pervasiveness of weight among various age bunches and in addition factors that connected with corpulence in the Eastern Mediterranean area. The investigation of distributed papers in the vicinity of 1920 and 2011 utilizing Medline information base and WHO data base was carried out. Results demonstrates that stoutness has turned into a pandemic in a large portion of nations of the Eastern Mediterranean district and requiring dire to battle this pestilence.

Ezeanochie, et al. (2011) broke down the predominance of maternal weight in early pregnancy and think about the resulting pregnancy result among obese and non-obese in Nigeria. A case control ponder from 2006 to 2008 utilizing a hospital obstetric and perinatal information base was directed. The outcome demonstrated that corpulence in early pregnancy is a hazard factor for unfriendly pregnancy result among pregnant Nigerian ladies.

Mustillo, et al. (2013) analyzed how weight at various ages impact mental pain in late immaturity utilizing longitudinal information on black and white young ladies. Information from the national development and wellbeing study was utilized. Discoveries demonstrated critical proximal and distal impacts of corpulence on mental misery among white young ladies and there were no distal impacts among dark young ladies.

Wadsworth and Pendergast (2014) tried to contemplate how the connection between heftiness and life fulfillment is affected by the commonness of corpulence in the setting in which people are living. Information from the Behavior Risk Factor Surveillance System was utilized. Discoveries demonstrated that heftiness is contrarily connected with life fulfillment. Large people when all is said in done are less happy with their lives than the non-corpulent.

Cunningham, et al. (2014) attempted to locate the national frequency of heftiness among kids in United States. Information from the early childhood longitudinal investigation was utilized. The outcomes demonstrated that episode heftiness will probably have happened at more youthful ages, principally among kids.

Pisa and Pisa (2016) contemplated the pattern between South Africa's economic developments utilizing different economic development pointers with grown-up heftiness over a predetermined timeframe. Information for corpulence from national survey of South Arica led in 1998, 2003 and 2012 was utilized. Economic development markers were acquired from World Bank. Discoveries demonstrated that pattern affiliation exist between South Africa's economic development and grown-up heftiness. As Gini coefficient expanded, stoutness declined and when coefficient diminished heftiness expanded.

Tanzil and Jamil (2016) tried to decide the degree of weight of stoutness as a rising epidemic in Pakistan. The writing survey through PubMed web search tools in regards to stoutness trouble in Pakistan was directed. Results demonstrates that Pakistan is as of now experiencing plague of heftiness influencing all the age gatherings. The weight of heftiness is across the board among grown-ups and kids.

2.1 Marginal value of study

In this literature review, relationship between obesity and growth is described in different countries separately. The present study describes the interlinkages between obesity and growth through its impact on global burden of disease in different regions like south Asia, Latin America and Caribbean, Europe and central Asia, Sub Saharan Africa and North Africa and Middle East. This study describes obesity as a general health disaster that seriously weakens the health and personal satisfaction of individuals and adds impressively to national medicinal services spending plans. Due

to obesity economy produce low but pay a direct cost in the form of treatment of diseases produced by obesity which is a burden on the economy. This study will help the government to design polices which are most suitable according to need to prevent obesity.

3. Theoretical Framework

This section explained the detailed theoretical relationship of obesity with economic growth in high income developed countries and low income under developed countries. Diseases from obesity like diabetes and hypertension and the burden of diseases on economy is also described. Due to obesity economy produce low but pay a direct cost in the form of treatment of diseases produced by obesity.

3.1 Explaining the concept of obesity

Stoutness is a restorative condition in which body fat has extended to the extent that it may have negative effect on wellbeing. People are seen as hefty if their body mass record is more noteworthy than 30 kg\m2 and the population with body mass index 25-30 kg\m2 considered as overweight. Corpulence grows the diverse diseases like coronary sickness, diabetes, and certain sorts of growth, hypertension so forth.

Obesity is caused by excessive nourishment intake with high calories and absence of physical work. By and large obese individuals have an incredible vitality expenditures in respect to thin individual because of vitality required to keep up an expanded body mass. Obesity is one of the main source of death in entire world. Various examinations have discovered that mortality chance is bring down at a body mass record of 20-25 kg\m2. A gathering of analysts demonstrated that while rising patterns, for example, an ascent in obesity rates at all ages, are considered, figures of future life expectancy is lower than they would have been something else.

Obesity is more in improved countries yet now the pattern has spread around the world. In advanced nations individuals utilizes the fast food and don't take work out. Individuals in advanced nations have high pay so they eat more sustenance full with high calories which will lead them towards obesity. Because of obesity their vitality level tumbled down and they cannot partake in economy with full exertion which is not a decent

sign for the economy. Obesity is more typical in ladies than men. Specialists post it as a standout amongst the most difficult issues of 21st century.

3.2 The way people in developed countries become highly obese

Individuals in high pay advanced nations have more pay to spend. They utilize the fast food and don't practice and along these lines their physical work diminish. Since individuals have high wage so they eat more nourishment with high calories which will lead them towards obesity. Because of obesity they have chronic sicknesses like diabetes and hypertension because of which their vitality level tumbled down and they cannot partake in the economy with full force. This will put weight on economy in light of the fact that their treatment expenditures will increase. Chronic diseases like cancer which are costly to treat. It likewise expanded the transportation cost. So it has many negative impacts on wellbeing and economy.

Fatty sustenance is not the main factor which make the population of a created nation obese. Heaps of thing responsible to make individuals obese. Specialists tries to demonstrate that the impact of technology like television and PCs screens. The measurements demonstrates that each 10 % expansion in that a nation spend on technology give 1% ascend to the weight. Technology does not keep individuals on their seats however it likewise changes the way individuals eat i.e. including more calories by eating fast food and lessening physical work. The normal individuals in created nations like America watches around four hours of TV for each day. This action connected with obesity or overweight in various investigations.

The study of National Health and Nutrition Examination demonstrates that individuals with overweight and obesity invest more energy before TVs and PCs and playing computer games than individuals of normal weight. Sitting in front of the TV over two hours in a day additionally have the danger of overweight and corpulence in the youngsters. Issue is that in advanced nation’s individuals sitting in front of the TV rather than practice or doing that exercises that consume more calories (International Journal of Obesity, 2008).

Study demonstrates that eating in front of TV likewise a reason of overweight and obesity in the created nations since individuals expends

more calories in front of TV. Indeed children will be more dynamic when they won't be sitting in front of the TV. The reason is that the children ate a greater number of snacks when they were sitting in front of the TV than while doing different exercises and this will lead them towards obesity in light of the fact that their physical work diminish. This issue is more in the exceptionally developed nations like United States America and this is the reason there is an expansion in the proportion of obese individuals in late time.

Another argument behind why individuals in high wage created nations are more obese is stress and related issues. Stress is a major issue in the feeling of obesity. For instance, in nowadays individuals do a considerable measure of work and have few vocations. In numerous families father and mother both work which makes harder for them to discover time for families, shopping and eat solid food together in table. We hear in TV news more violent activities by kids. This expands the level of worry in the mind of guardians.

Due to this fear parents allow their children to ride their bikes and to play in the parks. Parents end up driving kids to play dates and structured activities, which means less activity for the kids and more stress for parents. Time pressures for school or family lead people to eat food on the run or to sacrifice sleep. These both things can increase weight. Stress and lack of sleep are closely interconnected to psychological well-being which will also affect diet. Studies have showed that some people eat more when they are affected by depression or emotional disorders. In turn overweight and obesity both will increase emotional disorder.

3.3 Obesity in developing countries

Amid the most recent 30 years economic improvement, natural and social changes have been amazing especially from 1977 to 1999 in the less developed regions of the world. In this period a predictable change in obesity had been found in all developing nations like in sub Saharan African nations. Changes in food in these 30 years have additionally seen regarding increment in fat and meat in developing nations. Urbanization phenomena is likewise connected with weight as it will change nature and the most essential eating routine of the population.

Individuals who are living in rural zones eat crisp sustenance with less calories do physical work. Yet, now a days because of the technological change and industrialization individuals move towards urban territories. This phenomena is more in developing nations. At the point when individuals moved towards urban territories their diet and environment will be changed. They will utilize for the most part fast food with high calories which will put unfriendly impact on them on account of weight. The procedure of urbanization is more in developing nations than advanced. Urbanization is very associated with dietary and hazard components of chronic diseases and most essential with obesity.

In Africa a complex condition of underweight and overweight has been seen. From 1992 to 2005, overweight and obesity increased almost a third in sub Saharan Africa. This increase in obesity in Africa was recently seen in women and urban residents. The rising obesity poses socioeconomic challenges to the region. In 46 WHO African countries 17 countries had 10% prevalence of obesity in women. In 1990 obesity was high in Northern Africa which was 7.5% and in Southern Africa was 6.4%. This increased in obesity in African was due to the closely relation with urbanization. Therefore urban population has high rate of obesity which was 10% rather than rural areas which was 4% in Africa.

Marital status is also an important factor of obesity in sub Saharan African countries. Married people are more obese than non-married. Mogre et al. (2014) showed in a study among medical students found that individual who were married were six time more obese than the individual who are not married. Researchers shows that people who are not married are at a low risk of obesity in Africa. Preferred body size has been linked with obesity in some of African countries. In these countries obesity is related with good health, beauty, strength and wealth. People preferred their body size to look obese. But now in recent studies this concept is no more.

Unhealthy diet, physical inactivity, smoking and consumption of alcohol are the life style factors of African countries and these factors are linked with overweight and obesity. Consumption of calorie dense food and low use of vegetables and fruits have been related to obesity. People who engaged in different activities were at lower risk of obesity than people who were not engaged in activities. Studies shows that obesity is negatively linked with a person’s productivity and performance of work. Obese people will not take part in the economy with full energy and they

will want more leisure time which will adversely affect the economy of a country.

The requirement for thinks about on the expanding commonness of obesity in developing nations is more noteworthy now than at any other time as more nations are achieving their development objectives and more individuals are encountering the sustenance and economic progress related with improvement. In this manner, the earth is being set for the indication of chronic diseases identified with adequate vitality accessibility and changes in physical movement related with advancement and urbanization. Obesity is only one of these results but it is additionally connected with numerous other chronic diseases, in this manner aggravating the issue. Noteworthy endeavors must be made to comprehend the etiology of obesity in developing nations and make strategies by which it can be counteracted and controlled in social orders not normally acclimated to managing over nutrition and chronic diseases.

3.4 Linking obesity with economic growth

The prosperity of a country is measured in terms of its annual gross domestic products which has different relationships with papulation level of body weight and happiness. A suitable level of gross domestic product provides a sustainable economic activity, happiness and means level of body mass index. As GDP will increase of a country the economy of that country will also rise. The people of that country will more prosperous. Many factors effects the economic growth inversely like obesity. Obesity has a direct relation on the growth of economy.

Countries with more obese people have a negative effect on their economy. The reason is that obese people have different kind of chronic diseases like hypertension and different kinds of cancer. Due to obesity their energy level will decrease and they do not take part in the economy with full effort and put a negative effect on the economy. It increased the treatment cost and transportation in a country. Chronic diseases like cancer and diabetes are expensive to treat. So it have many negative effect on economy.

The developed countries like United States America observed a high level of obesity from last few years. One third people were obese. The reason is that in developed countries people eat fast food with high calories which

leads them towards obesity. So, obese people want more leisure time because they have low energy level due to different kind of chronic diseases. So this effected the economic growth because people do not take part in economy.

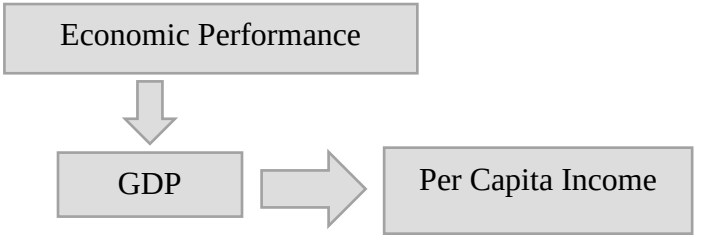
3.5 Obesity and Global Burden of Diseases

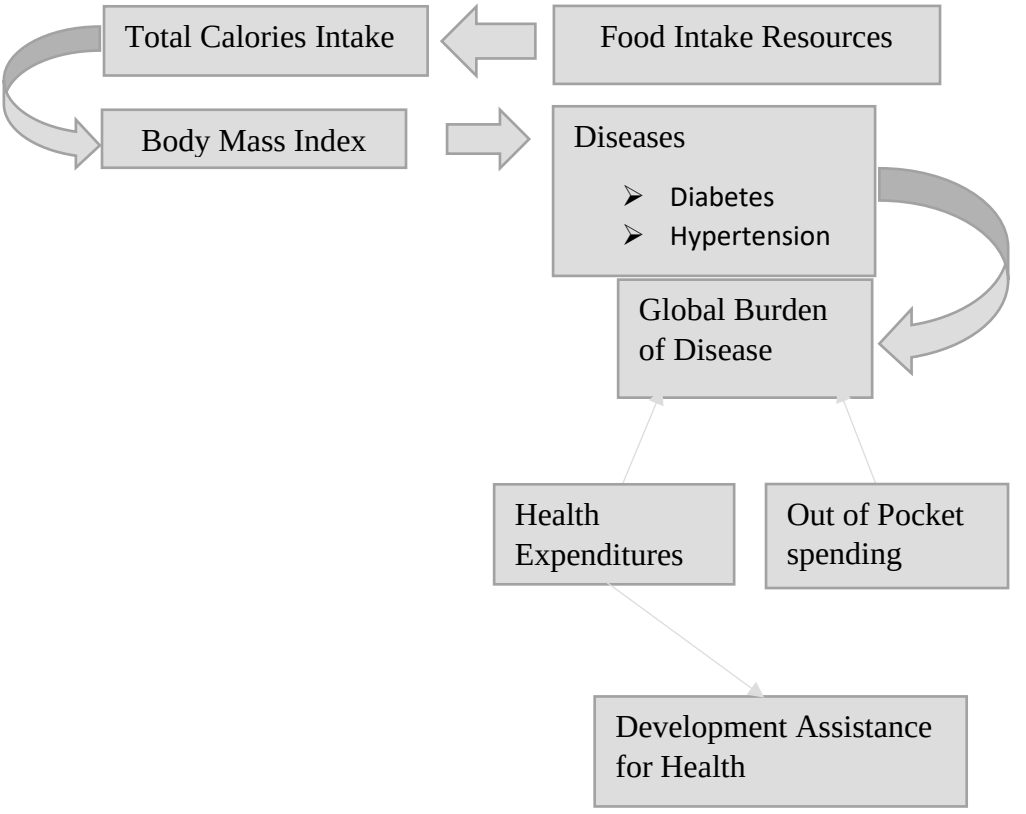
The pervasiveness of obesity is expanding at a disturbing rate in many parts of the world. Around 2 billion individuals are overweight and 33% of them are obese. The predicament of the most influenced population, similar to those in high-wage nations in North America, Australasia and Europe, has been all around exposed. In any case, the later increments in population obesity in low-and middle salary nations that are now progressively being watched have been less perceived.

In light of the current commonness and pattern information and the epidemiological proof connecting obesity with a scope of physical and psychosocial wellbeing conditions, it is sensible to portray obesity as a general health disaster that seriously weakens the health and personal satisfaction of individuals and adds impressively to national medicinal services spending plans. The expansion in weight worldwide importantly affects health weakness and lessened personal satisfaction. Specifically, obesity has a vital commitment to the worldwide rate of cardiovascular sickness, diabetes and hypertension. Obesity has a more pronounced effect on dismalness than on mortality.

Another cast that economies have to pay is in the form of low productivity. Due to ill health workers will produce less which will impact his income and the firm's profit. By low production the economy of country will directly affected. Due to obesity economy produce low but pay a direct cast in the form of treatment of diseases produced by obesity. This is the problem mostly in low income or developing countries.

Figure 3.1: Diagrammatic Representation of Theoretical Links





4. Variables and Data Sources

The research is consisting of two parts. First is comprises of descriptive analysis of variables which can be defined as follow:

Variables

4.1 Economic Growth
4.2 Out of pocket spending as share of total health spending
4.3 Calories per day
4.4 Total health spending
4.5 Development assistance for health as share of total health spending
4.6 Diabetes
4.7 Hypertension

4.1 Economic Growth

Economic growth or GDP growth means that an increase in the amount of goods and services produced by an economy. The total market value of all final goods and services produced in a given year and it is equal to total consumer, government spending and investment plus the value of exports and minus the value of imports. The basic purpose of this study is to analyze the economic growth with obesity through its impact on global burden of disease.

4.2 Out of pocket spending

In the medicinal services and protection businesses, out of pocket costs allude to the segment of the doctor's visit expense that the insurance agency does not cover and that the individual must pay all alone. Out of pocket human services costs are not the same as deductibles. Rather, it is an umbrella term that alludes to deductibles, co-pays and coinsurance.

4.3 Food Calories

Calories are unit of energy. Food calories are defined in terms of kilogram rather than gram. It is equal to 1000 small calories and called kilocalorie. An average woman need 2000 calories in a day and 1500 calories in a week to lose one pound weight but an average man require 2500 calories to maintain and 2000 to lose one pound of weight in a week. Food calories are related with health. People who take high calories daily caught by obesity and then they can suffer from different kind of diseases.

4.4 Total health spending

Total health spending mean how much a country spend on health. Health spending measures the last utilization of medicinal services products and enterprises including individual human services and aggregate services.

4.5 Diabetes and Hypertension

Diabetes is a sickness in which your blood glucose, or glucose, levels are too high. And Hypertension is a condition show when blood courses through the veins with a force more prominent than normal. Values of both diseases are taken between 0 to 100 indexes.

4.6 Development Assistance for health

The measure of research on donor money related help to health, usually called development assistance for health (DAH), has expanded significantly over the most recent decade. Aid flows for health have doubled since 2000s due to the rapid increase in economic growth.

4.7 Data Sources

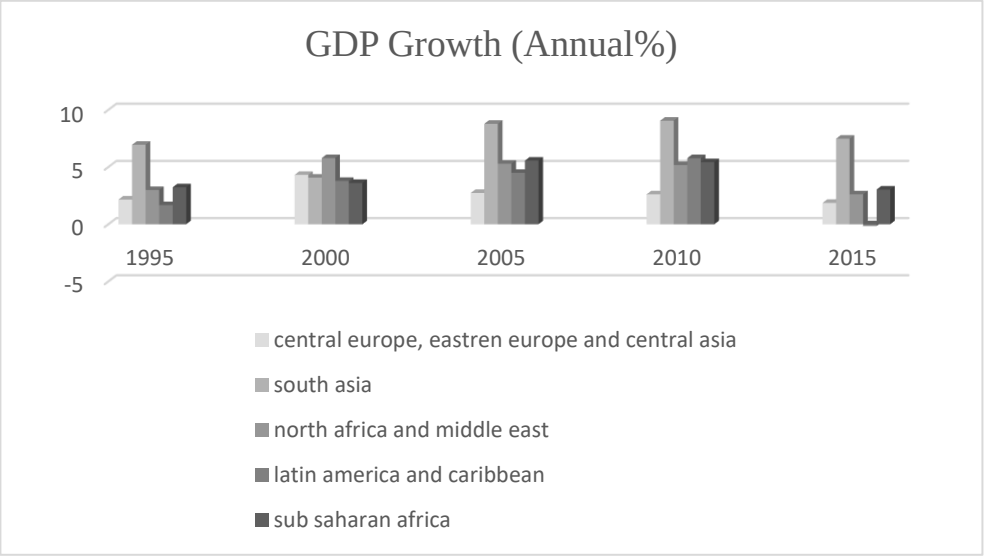
For this study, data for GDP growth (Annual %) is taken from the world development indicator for the years 1995 to 2016 for the regions like south Asia, Sub Saharan Africa, Europe and central Asia, Latin America and Caribbean and North Africa and Middle East. Data for diseases is taken from WHO study for the global burden of disease for the period of 1995 to 2016. And the data for calories intake per day is taken from Food and Agriculture Organization (FAO) for the year for the year 1992 to 2002. Data is taken till 2001 for calories intake per day and till 2015 for GDP growth and diseases due to the unavailability of data for some countries.

5. Discussion and Analysis

Economic growth in recent decades has given impressive scope for decreasing appetite and malnutrition. During 1990 and 2010, real per capita earnings grew by about 2 percent for each year universally, in spite of major difference among nations and between decades.

A nation's economic growth is normally demonstrated by an expansion in that nation's GDP or Gross domestic product. Generally, total national output is an economic model that mirrors the estimation of a nation's yield. A nation's Gross domestic product is the aggregate money related estimation of the goods and services created by that nation over a particular time frame. An increase in GDP of a country means that economic growth increase. Due to economic growth per capita income will rise and poverty will also be reduced in developing nations. In this study GDP growth of different regions like Sub Saharan Africa, Latin America and Caribbean, South Asia and North Africa and Middle East is analyzed.

Figure 5.1 GDP Growth (Annual %)



Source: World Development Indicator (WDI), 1995-2015

These all region represents the developing countries. Growth rates for all regions of developing nations were quicker in the 2000s than in the 1990s due to rapid industrialization process, with the most sensational turnarounds occurring in Africa and south Asia. The most fast development rates happened in South Asia due to the rapid growth in some countries like India and China whose growth rates were above 10%. Due to robust growth in India, South Asia demonstrates strength notwithstanding turbulent worldwide markets and remains the quickest developing region in the world, with economic development determined to continuously quicken from 7.1 percent in 2015 to 7.3 percent in 2017 (World Bank, 2016).

According to world bank report (2017) development in Europe and central Asia (ECA) is conjecture to quicken marginally in 2017, after the adjustment of oil costs, profiting the eastern portion of the region, and a proceeded with recuperation in the western portion of the area. After solid economic headwinds in recent year, economies in Europe and central Asia (ECA) are coming back to a more steady development way and the locale is relied upon to grow 1.9 percent in 2017 and 1.8 percent in 2018. Economic growth in Sub Saharan Africa is also expected to be rising 3.2% in 2017 and 3.5% in 2018 due to better commodity price and improved global conditions (World Bank, 2017).

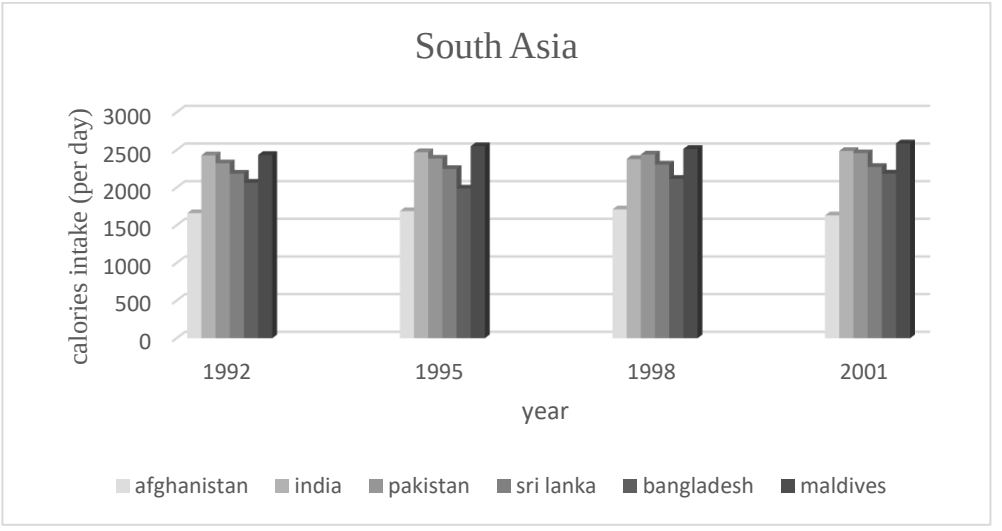
Due to an increase in GDP of a region, per capita income also increase and poverty will reduce in that region. Growth will also create new jobs which will reduce unemployment. Due to growth people have enough money to spend on food and they prefer to eat more food with high calories. High calories will resulted in the form of obesity.

5.1 Trends in Dietary Energy supplies (calories per day)

The 2 % per annum increases in real per capita earnings between the years 1990 and 2010 realized extended enthusiasm for dietary vitality. By and large, for the entire world, dietary energy supplies (DES) extended by around 210 kcal per individual for every day, or 8 percent. The extension was greater in the creating countries 275 (kcal/singular/day) than in the advanced countries 86 (kcal/singular/day). Across the developing countries, the greatest supreme increment 260 to 270 kcal consistently were in Asia and Latin America and the Caribbean. Gross domestic product development pattern of south Asia and Caribbean area is high than others because of which individuals have more cash to spend on nourishment and they will like to eat high calories sustenance. While the little increment under 130 kcal consistently were in sub-Saharan Africa and Center East where economic advancement was direct. Dietary vitality supplies changes as salary changes in a nation (The State of Food Insecurity in the World, 2012).

Worldwide the use of fruits, vegetables and animal products like fish increased while the use of cereals and roots decreased. By regionally there is contrast between regions which have rapid economic growth with the regions that have slow economic growth. In this study, the graphs of calories intake per day in different regions are made by which the food consumption in these regions can be analyzed.

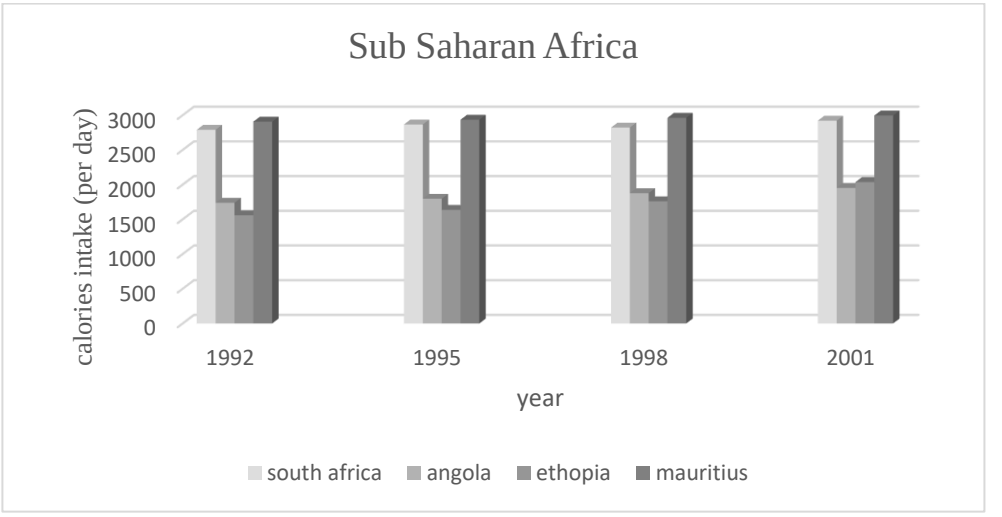
Figure 5.2 Per Day Calories intake in South Asia



Source: Food and Agriculture Organization (FAO), 1992-2001

In the fast growing Asia calories intake per day by a person increases year by year as the growth rate of the regions increases. Due to the rapid industrialization process in south Asia, GDP growth increased in the countries. So people have more money to spend on food and their food consumption also change. There is a decline in the dietary energy from cereals and roots and increase in dietary energy from animal source products like fish and meat. Except Afghanistan, all countries in the South Asian region intake high calories because economic growth is more rapid in all these countries than Afghanistan. People of South Asia mostly eat fried food and dairy food. Products made from sugar are also used in high quantities in South Asian countries. The FAO statistical database does not provide information about the distribution of food among countries of a region. As income develop, the contribution of grains, roots and tubers to add up to per capita DES diminishes though the contribution of animal source nourishments and of products of the soil vegetables increment essentially.

Figure 5.3 Per-Day Calories Intake in Sub Saharan Africa



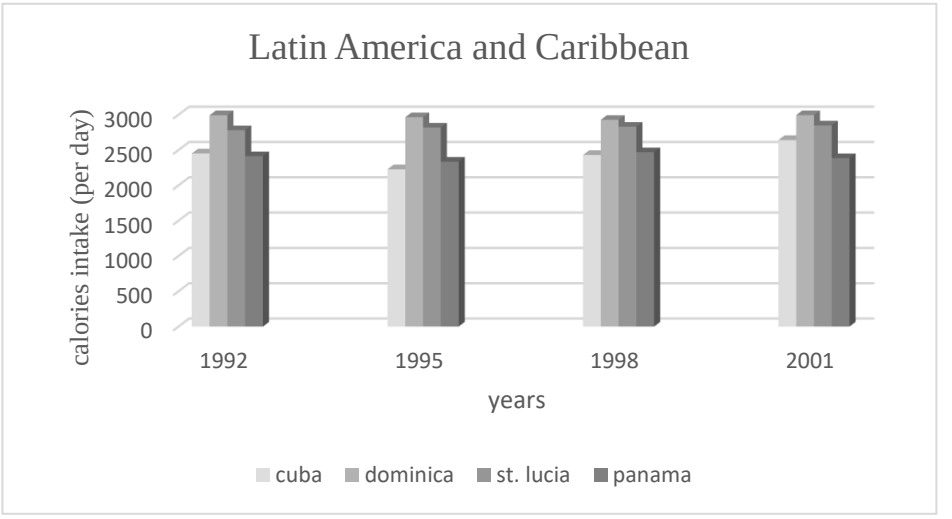
Source: Food and Agriculture Organization (FAO), 1992-2001

In Sub-Saharan Africa, however, dietary energy availability from cereals, roots and tubers increased while dietary energy from animal-source foods and fruits and vegetables was essentially constant. This is the reason that the rate of diseases is low in the Sub-Saharan Africa relative to other regions. Most of the countries in the sub Saharan Africa region have low per capita income due to low GDP growth in this region. So people have less money to spend on food. Growth in Sub-Saharan Africa is now improving, bolstered by modestly rising item costs, reinforcing outer demand, and the finish of dry season in various nations. Analysis of FAOSTAT (2003) data shows that the per capita supply of calories has remained practically stale in Sub-Saharan Africa and has fallen in the nations in economic move. So due to low GDP growth and low per capita income, most people in sub Saharan Africa region have cereals and root diet energy food.

Development in Sub-Saharan Africa is estimate to get to 2.6 percent in 2017 and to 3.2 percent in 2018, predicated on tolerably rising item costs and changes to handle macroeconomic irregular characteristics. Per capita yield is anticipated to shrivel by 0.1 percent in 2017 and to increment to an unassuming 0.7 percent development pace more than 2018-19. At those rates, growth will be deficient to accomplish poverty reduction

objectives in the region, especially if requirements to more lively development hold on (World Bank, 2017).

Figure 5.4 Per-day Calories Intake in Latin America and Caribbean



Source: Food and Agriculture Organization (FAO), 1992-2001

In Latin America and Caribbean region economic growth increased rapidly in 2000s due to which the life style of people of this region also changed as most of people move towards rural areas from urban areas and there is also a change in the food consumption from low calories diet to high calories diet. Due to improved economic condition hunger has fallen in the region but overweight and obesity are on the increase. While appetite and unhealthiness have fallen, overweight and obesity are on the ascent all through Latin America and the Caribbean, and are especially predominant among ladies and kids, as indicated by another report in 2016 by the Food and Agriculture Organization of United Nation (FAO) and the Pan American Health Organization (PAHO). As per the report, hunger has tumbled to just 5.5 % of the local papulation, yet 23 % are obese and 58 % are overweight.

As income develop, the contribution of grains, roots and tubers to add up to per capita DES diminishes though the contribution of animal source nourishments and of products of the soil vegetables increment essentially. The relative contribution from sugars to general DES is additionally obviously ascending with expanding income in many regions. Utilization

of milk per individual has practically multiplied in developing nations, meat and fish utilization has tripled, and egg utilization has expanded by a factor of five. Development has been most grounded in Eastern and South- Eastern Asia and in Latin America and the Caribbean, though it stagnated in Sub-Saharan Africa. The rates of development were for the most part bring down in developed nations, where utilization levels were at that point higher than in developing nations.

The FAO-WHO Consultative Group on Nutrition (2003) has determined that, on average a daily diet of around 2,200 calories is sufficient to meet basic nutrition needs. But the trends of all these developing nations shows that the average calories intake by a person in a day is more than 2500 in a day. These excessive calories reflect the body mass of a person so people become obese due to extra calories because these extra calories store in the body in the form of fat. People are considered obese if their body mass index is greater than 30 kg\m2 and the people with range 25-30 kg\m2 considered as overweight. Obesity increases the various diseases like heart disease, diabetes, certain types of cancers, hypertension etc.

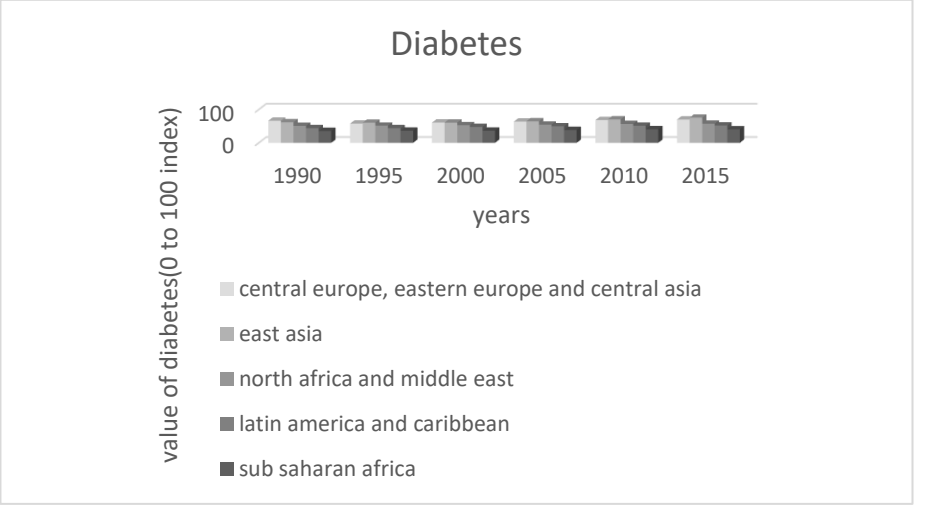
5.2 Trends of Diseases due to excess of calories

All the developing regions like South Asia, sub Saharan Africa and Latin America and Caribbean have encountered a striking economic development amid most recent two decades alongside ensuing change in social, economic and food frameworks. Rising disposable cash levels keep on driving the nourishment move portrayed by a move from a conventional high carbohydrate, low-fat weight control plans towards diets with a lower carbohydrates and higher extent of soaked fat, sugar and salt. Guided by different moves in statistic, economic and nutritional terms, the population of these regions are encountering a quickly changing disease profile. All these regions are now facing an arising epidemic of obesity and other non-communicable diseases (NCDs). This burden is achieving a genuine health and economic problem and is producing enormous pressure on the economies of these regions.

Diabetes and hypertension are the major diseases produced from obesity (WHO, 2016). All these developing regions are at high risk of diabetes. The rate of diabetes increases year by year in all the developing regions. The high risk of diabetes is linked with changing demographic profile

with urbanization and changing life style. . The Framingham Heart Study, an acclaimed study for a long time, evaluated that overabundance body weight including overweight and obesity represented roughly 26 percent of instances of hypertension and diabetes in men and 28 percent in ladies. Obese people have an expansion in greasy tissue that expands their vascular resistance and thusly builds the work the heart needs to do to direct blood all through the body.

Figure 5.5 Trends for Diabetes



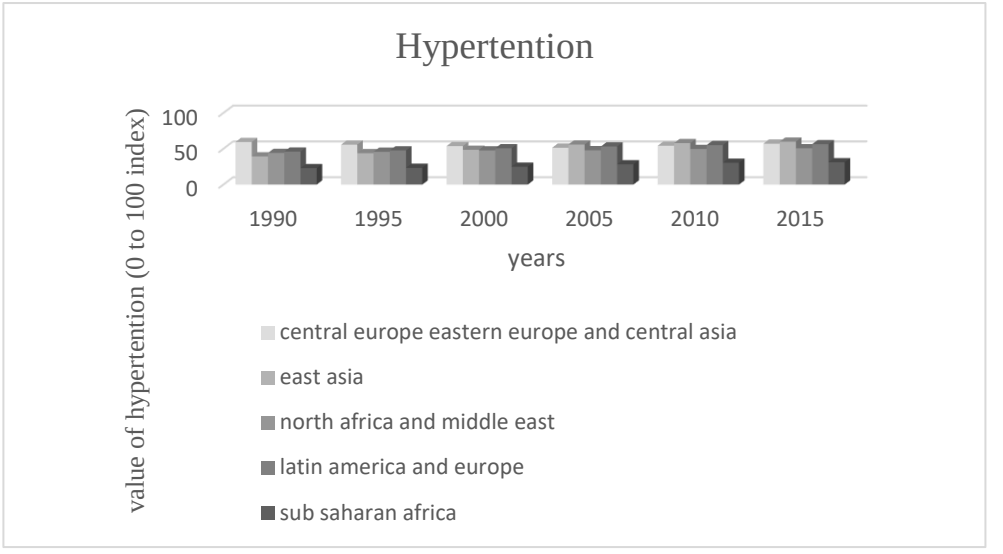
Source: World Health Organization (WHO), 1990-2015

Diabetes represents a lion's share of social insurance costs, as 30% of overweight individuals have the sickness while 85% of diabetics are overweight. The rate of diabetes increases year by year in all the developing regions. Europe and central Asia region has the highest rate of diabetes. In the UK, the National Institute for Health and Care Excellence (NICE), 2014 says in a report that South Asia origin is at a high risk of emerging diabetes due to the having body mass index of 23 or more. As economic growth increases rapidly in South Asia, calories intake per day are increases year by year due to which diabetes increases at constant rate.

But Sub Saharan Africa region has high values of diabetes than South Asia because due to economic growth urbanization process is very fast in this region. The high risk of diabetes is linked with changing demographic profile with urbanization and changing life style. The same procedure is in

Latin America and Caribbean region as economic growth increases, calories intake per day also increases in this region and rate of diabetes is increases and average calories intake are more than 2500 per day. By taking more calories obesity generate due to which diabetes also increases (Edwards, 2003).

Figure 5.6 Trends for Hypertension



Source: World Health Organization (WHO), 1990-2015

Hypertension is also a major disease produced by obesity. The Framingham Heart Study, an acclaimed study for a long time, evaluated that overabundance body weight including overweight and obesity represented roughly 26 percent of instances of hypertension in men and 28 percent in ladies. Obese people have an expansion in greasy tissue that expands their vascular resistance and thusly builds the work the heart needs to do to direct blood all through the body.

The rate of hypertension is very high Europe and central Asia region, Latin America and Caribbean and South Asia region. According to World Health Organization (2012) report, in South Asia hypertension is a leading factor for mortality. In south Asia region economic growth is very fast all the countries in this region have high income and they use animal source food mostly. High calorie food mostly used in these regions by which

people become obese and disease like hypertension produced. The WHO (2012) report shows that in all these regions hypertension is emerging at high rates year by year. As graph shows that as growth increases in 'Europe and Central Asia' and Latin America regions, calories intake per day is also increases which are much more than calories that are required per day. By consuming more calories obesity increases due to which rates of hypertension also increases and at alarming situation in these regions.

All of these major diseases are the outcome of obesity. A current report assesses that 2.1 billion individuals, almost 30% of the total populace are obese or overweight. The worldwide medical issue is no longer limited to cutting edge nations. Actually, over 60% of the obese population lives in creating nations.

As rising economies keep on industrializing, a resulting increment in income has prompted high caloric intake. In correlation, there are 805 million undernourished individuals on the planet and around 2.5 times more prominent pervasiveness of overweight and obese individuals. As obesity keeps on inclining towards a pestilence, the emergency is not only a health risk but economic risk also. The rapid growth in these diseases increase the health expenses of a country which is a burden on the economy because most of the income of a country spend on health.

5.3 Economic Incidence in terms of Global Burden of Diseases

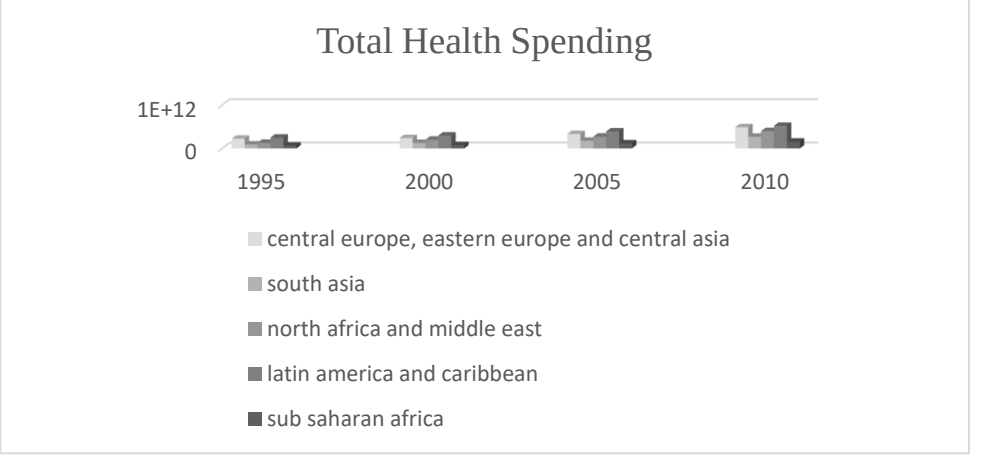
When economic growth of a country or a region increases, per capita income of that region also increases. Due to increase in per capita income, life style of the people also changes. Because due to high income most of people move towards urban areas from rural areas and there is also a change in the diet of the people as mostly move towards high calorie diet from low calories diet. Extra calories stored in the body and then converted into fat by the body. This fat then leads the body towards obesity.

Due to obesity some major diseases produced like diabetes and hypertension. Mortality rate and expenditures for treatment increases from these diseases. So as economic growth increases, global burden of disease also increases. Another cost that economies have to pay is in the form of low productivity. Due to ill health workers will produce less which will

impact his income and the firm's profit. By low production the economy of country will directly affected. Due to obesity economy produce low but pay a direct cost in the form of treatment of diseases produced by obesity. This is the problem mostly in low income or developing countries.

Following graphs shows the total health spending, out of pocket spending and development assistance as share of health spending in the different regions. The graph explains how much health spending increases as economic growth increases.

Figure 5.7 Total Health Spending



Source: Institute for Health Metrics and Evaluation (IHME), 1995-2010

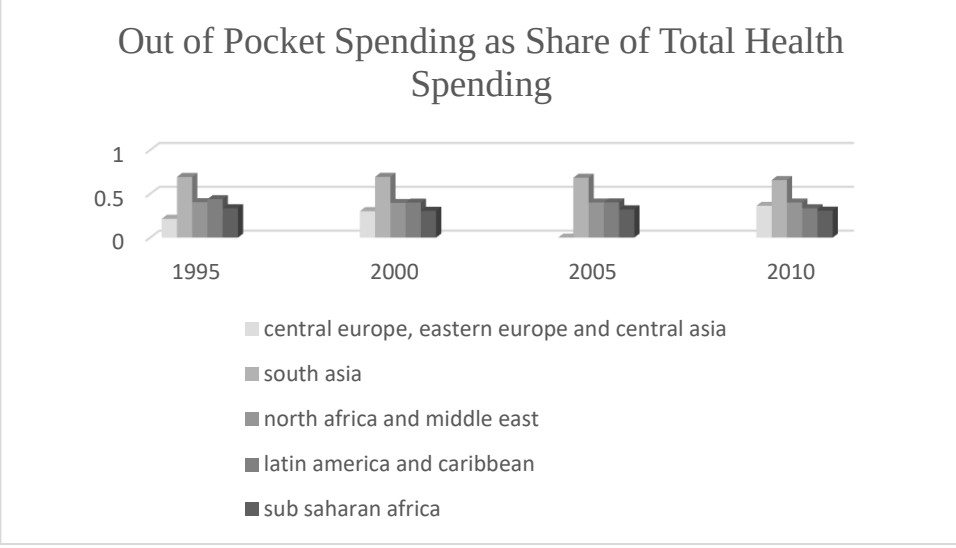
Total health expenditure is the sum of public and private health expenditures as a ratio of total population. It covers the provision of health services family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation. The graph shows that as economic growth done rapidly in 2000s, the total health spending of these regions also increases more rapidly in 2000s. Due to more calories in a day, people caught by obesity and then different kind of diseases. In this way government have to spend more money to overcome these diseases.

Health consumption, add up to (% of Gross domestic product) in Latin America and Caribbean was accounted for at 7.2803 % in 2014, as per the World Bank (2015) accumulation of improvement pointers, aggregated

from authoritatively perceived sources. In ‘Europe and central Asia’ and ‘North Africa and Middle East’ region health expenditure also increases rapidly in 2000s as the economic growth increases. The stats of Global Burden of Disease (GBD) analyses that as growth increases health expenditure increases rapidly. According to world health organization, in 2006 globally health expenditure was 8.7% of gross domestic product.

Notwithstanding immediate costs reflected in health care, backhanded expenses related with obesity incorporate diminished work efficiency, high laborers' pay claims, and lower income. Obesity not just costs the individual, additionally the business. The graph of total health spending shows that the expenses on health increases rapidly every year in all these developing regions which put a direct burden on the economy by spending more part of money in health sector.

Figure 5.8 Out of Pocket Spending as Share of Total Health Spending



Source: Institute for Health Metrics and Evaluation (IHME), 1995-2010

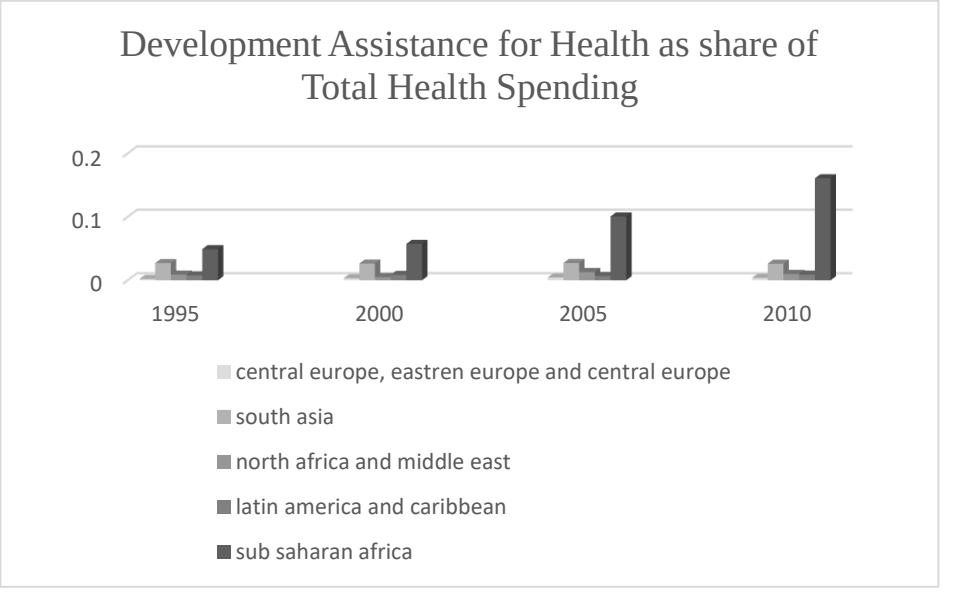
In the medicinal services and protection businesses, out of pocket costs allude to the segment of the doctor's visit expense that the insurance agency does not cover and that the individual must pay all alone. Out of pocket human services costs are not the same as deductibles. Rather, it is an umbrella term that alludes to deductibles, co-pays and coinsurance. Apparently, out of pocket costs constrain the protection holder to

precisely consider regardless of whether he really needs restorative care. By making the individual incompletely in charge of his own charge, it decreases the odds that he is probably going to utilize his protection scope pointlessly.

The graph shows that, South Asia region pay more out of pockets endings. South Asia region have rapid economic growth but has low total health spending due to which out of pocket spending is high because most of countries in south Asia are either low income or middle income countries. Governments give fewer resources to provide free or subsidized health care. So most of people take treatment from their own resource that's why out of pocket spending is high in developing countries.

Latin America and Caribbean has low out of pocket spending than South Asia because their total health spending are high. Government gives more resources for free health care and people use their own resources less. So the regions which have low total health spending will have high out of pocket spending because they give less resources for free or subsidized health care. Out of pocket spending is regressive because lower income people pay disproportionality more than the high income people. When government of a country give less resources for free health care, treatment for diseases will be expensive. This will not be an issue for high income people because they can afford it but low income people spend most of their household expenditures on treatment.

Figure 5.9 Development Assistance for Health as share of Total Health Spending



Source: Institute for Health Metrics and Evaluation (IHME), 1995-2010

The measure of research on donor money related help to health, usually called development assistance for health (DAH), has expanded significantly over the most recent decade. Aid flows for health have doubled since 2000. The graph shows that development assistance for health is more in the Sub Saharan region because this region have low total health spending and out of pocket spending. This is due to because more of countries in this region are poor. Assistance to fight against the major health problems in Sub Saharan Africa has reached extraordinary level. Global attention for health in Sub Saharan Africa has increased dramatically. So due to global assistance deaths from malaria and maternal mortality has dropped by more than half.

While the remaining developing regions have very low development assistance for health. As aid for these regions is very low so they have to spend income from their own resources for health which will increase burden on the economy of a region.

High calories consuming countries have more burden of diseases like hypertension and diabetes. Due high rates of these diseases, government expenditures on health increases and economy fall due to decrease in exports. While in low calories consuming countries, rates of these diseases are low due to low rates of obesity.

So as the economic growth increase, people have more money to spend and have cheap food. So they refer to eat more food with high calories. Excess calories store in the body in the form of fat which is the main cause of obesity. Due to obesity people of a country caught by different diseases like diabetes and hypertension. If people in an economy are ill then they will not take part in the economy with full efficiency and the production of the economy will also decrease due to which exports of a country will fall and their total GDP will also fall. This will put a direct burden on the economy as governments have to spend more money on health sector.

5.4 Comparative Analysis

A nation's economic growth is normally demonstrated by an expansion in that nation's GDP or Gross domestic product. Generally, total national output is an economic model that mirrors the estimation of a nation's yield. A nation's Gross domestic product is the aggregate money related estimation of the goods and services created by that nation over a particular time frame.

Prosperity of a country is measured in terms of its annual gross domestic products which has different relationships with population level of body weight and happiness. Suitable levels of gross domestic product provide a sustainable economic activity, happiness and mean level of body mass index. As GDP will increase of a country the economy of that country will also rise. The people of that country will be more prosperous. Many factors effects the economic growth inversely like obesity. Obesity has a direct relation on the growth of economy.

Obesity is a medical condition in which body fat has increased to the extent that it may have negative effect on health. Obesity is a crucial concern since it is related with poorer mental health results, diminished personal satisfaction, and the main sources of death in around the world, including diabetes, hypertension and a few sorts of cancer. These diseases are responsible for a lot of deaths in worldwide. So these diseases increased the treatment cost in the world.

In light of the current commonness and pattern information and the epidemiological proof connecting obesity with a scope of physical and psychosocial wellbeing conditions, it is sensible to portray obesity as a

general health disaster that seriously weakens the health and personal satisfaction of individuals and adds impressively to national medicinal services spending plans. The expansion in weight worldwide importantly affects health weakness and lessened personal satisfaction. Specifically, obesity has a vital commitment to the worldwide rate of cardiovascular sickness, diabetes and hypertension. Obesity has a more pronounced effect on dismalness than on mortality.

Another cast that economy has to pay is in the form of low productivity. Due to ill health workers will produce less which will impact his income and the firm's profit. So obesity is a burden for the world economy in the form of expenditures on diseases it produces and low production.

6. Conclusion and Policy Recommendations

6.1 Conclusion

The present study tries to explore the impact of obesity on the economic growth in different developing regions of world like South Asia, Sub Saharan Africa, north Africa and middle east, Latin America and Caribbean and central Europe, eastern Europe and central Asia. Economic growth is measured in GDP. At first the trend of GDP of these regions was made through data from the world development indicator. The trend shows the rate of growth in different years. As the GDP growth rate of a region increase, per capita income of that region also increases. As per capita income increase, people have more money to spend on food.

Secondly, the graphs of calories intake by a person per day was made and the trend of the regions are shown separately. As the economic growth increase in a region per capita income of that country increase also. People of that region have more money to buy food. They tend to use animal source food like fish and meat which are full with high calories. The trend of calories shows that as growth increase in a region, there is an increase in calories intake by a person per day. It can be seen that there is a significant increase in calories intake every year as economic growth increase. People do not use these calories fully. Due to imbalance between calories consumed and calories expended obesity and overweight arise in the people.

By consuming more calories obesity arise in the people due to which major diseases are produces in the people like diabetes, hypertension and breast cancer. The graph of these diseases are made by taking data from GBD global burden of disease. The trend shows that as people consumed more calories in these developing regions, there is an increase in the rate of these diseases. The graphs of diseases shows that region that have rapid growth rate also have high burden of diseases. As these diseases increases, these put a burden on the economy in the form of increased health expenditure for better treatment. Another cost that economy have to pay is in the form of low productivity. Due to ill health workers will produce less which will impact his income and the firm's profit.

It is concluded that as economic growth increases, per capita income also increases. Resources become available to buy more food. As such people consumes more calories and obesity rates increases. Due to obesity major diseases like hypertension, diabetes and breast cancer also increases which put a burden on the economy because economy have to pay cast for the treatment of these daises.

6.2 Policy Recommendations

In the context of this study, following policy recommendations are proposed:

1) Government must encourage the people by teaching them about obesity in institutions.
2) Promoting healthy eating habits and encouraging exercise.
3) Developing public policies that promote access to health and low fat.

References

Andersson, S. O., Wolk, A., & Bergstrom, R. (1997). Body size and prostate cancer: a 20-year follow-up study among 135,006 Swedish construction workers. *J Natl Cancer Inst, 89*(4), 385-389.

Asfaw, A. (2006). The Effects of Obesity on Doctor-Diagnosed Chronic Diseases in Africa: Empirical Results from Senegal and South Africa. *Journal of Public Health Policy, 27*(3), 250-264.

Barid, J., Fisher, D., Lucas, P., Kleijnen, J., Robert, H., & Law, C. (2005). Being big or growing fast: Systematic review of size and growth in infancy and later obesity. *British Medical Journal,* 331(7522), 929-931.

Boutayeb, A., & Boutayeb. S. (2005). The burden of non-communicable developing countries. *International Journal, 4*(2), 185-195.

Cerhan, J. R., Janney, C. A., Vachon, C. M. (2002). Anthropometric characteristics, physical activity, and risk of non-Hodgkin's lymphoma subtypes and B-cell chronic lymphocytic leukemia: a prospective study. *Am J Epidemiol, 1*(2), 156-170.

Cunningham, S. A., Kramer, M. R., & Narayan, K. M. (2014). Incidence of Childhood Obesity in the United States. *The new England Journal of Medicine, 370*(5), 403-411.

Cole, T. J., Faith, M. S., Pietrobelli, A. & Heo, M. (2005): What is the best measure of adiposity change in growing children: BMI, BMI %, BMI z-score or BMI centile? *Eur. J. Clin. Nutr, 59*, 419-425.

Dietz, W. H., & Robinson, T. N. (1998). Use of the body mass index (BMI) as a measure of overweight in children and adolescents. *J. Pediatr, 5*(1), 132-138.

Ezeanochie, M.C., Ande, A. B., & Olagbuji, B.N. (2011). Maternal Obesity in Early Pregnancy and Subsequent Pregnancy Outcome in a Nigerian Population. *African Journal of Reproductive Health, 15*(4), 55-59.

Europe and Central Asia Economic Update. (2017). World Bank Report 2017. Retrieved from http://www.worldbank.org/

Gultekin, T., Ozer, B. K., Akın, G., Bektaş, Y., Sağir, M., & Guleç, E. (2009). Prevalence of overweight and obesity in Turkish adults. *Anthropologischer Anzeiger, Jahrg, 11*(1), 205-212.

Goodman, c., & Robert C. W. (2002). A Prospective Study of the Role of Depression in the Development and Persistence of Adolescent Obesity. *Pediatrics, 109*,497-504.

Global Report on Diabetes and Hypertension. (2106). World Health Organization report 2016. Retrieved from http://www.who.int/en/

Latner, J. D., Stunkard, A. J., & Wilson, G. T. (2005). Stigmatized Students: Age, Sex, and Ethnicity Effects in the Stigmatization of Obesity. *Obesity Research, 13*(2), 1226-31.

Mustillo, S. A., Budd, K., & Hendrix, K. (2013). Obesity, Labelling, and Psychological Distress in Late-Childhood and Adolescent Black and White Girls: The Distal Effects of Stigma. *Social Psychology Quarterly, 76*(3), 268-289.

Olsen, L. W., Baker, J. L., Holst, C., & Sørensen, T. I. A. (2006). Birth Cohort Effect on the Obesity Epidemic in Denmark. *Epidemiology, 17*(3), 292-295.

Pickett, K. E., Kelly, S., Brunner, E., Lobstein, T., & Wilkinson, R. G. (2005). Wider Income Gaps, Wider Waistbands? An Ecological Study of Obesity and Income Inequality. *Journal of Epidemiology and Community Health*, 59(8), 670-674.

Riemenschneider, F. M., Reinhold, T., Berghöfer, A., & and Willich, S. N. (2008). Health-Economic Burden of Obesity in Europe. *European Journal of Epidemiology, 23*(8), 499-509.

Rebecca, M., & Brownell, K. D. (2006). Confronting and Coping with Weight Stigma: An Investigation of Overweight and Obese Adults. *Obesity, 14*(10), 180-189.

Ross, C., Catherine E. (1994). Overweight and Depression. *Journal of Health and Social Behaviour, 35*(1), 63-79.

Samanic, C., Gridley, G., Chow, W. H., Lubin, J., Hoover, R. N., & Fraumeni, F. (2003).Obesity and Cancer Risk among White and

Black United States Veterans. *Cancer Causes & Control, 15*(1), 35-43.

Schafer, I., Markus H., & Ferraro, K. F. (2011). "The Stigma of Obesity: Does Perceived Weight Discrimination Affect Identity and Physical Health? *Social Psychological Quarterly, 74*(1), 76-97.

Sichieri, R., Field, A. E., Rich-Edwards, J., & Willett, W. C. (2003). Prospective assessment of exclusive breastfeeding in relation to weight change in women. *International journal of obesity, 27*(7), 815.

South Asia Remains World's Fastest Growing Region, but Should Be Vigilant to Fading Tailwinds. (2016). World Bank Report 2016. Retrieved from http://www.worldbank.org/

Tanzil, S., & Jamali, T. (2016). Obesity, an Emerging Epidemic in Pakistan: A Review of Evidence. *J Ayub Med Coll Abbottabad, 28*(3), 597-600.

Vito, E., Torre, G., Langiano, E., Berardi, D., & Ricciardi, G. (1999). Overweight and obesity among secondary school children in Central Italy. *Eur. J. Epidemiol, 15*, 649- 654.

Wadsworth, T., & Pendergast, P. M. (2014). Obesity (Sometimes) Matters: The Importance of Context in the Relationship between Obesity and Life Satisfaction. *Journal of Health and Social Behaviour, 55(*2), 196-214.