PROGRESS AND CONSTRAINTS OF HEALTH IN INDIA

A CROSS COUNTRY ANALYSIS

A THESIS

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KUNTAL GHOSH

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The Thesis is dedicated to

my family members, to all of my honourable Teachers and Co-

workers and to all of my friends

who are consistently offering toil & tears

for the advancement of this growing wing of knowledge.

Certified that the Thesis entitled

PROGRESS AND CONSTRAINTS OF HEALTH IN INDIA

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A CROSS COUNTRY ANALYSIS

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Submitted by me for the award of the Degree of Doctor of Philosophy in Arts at Jadavpur University is based upon my works carried out under the Supervision of Professor Sanjib Mridha, Department of Physical Education, Faculty of Arts, Jadavpur University, And that neither this thesis nor any part of it has been submitted before for any degree or diploma anywhere / elsewhere.

Countersigned by the Candidate:

Supervisor: Dated:

Dated:

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ABBREVIATION & ACCRONYMS

Avg.	Average
AARR	Average Annual Rate of Reduction
AAGR	Average Annual Growth Rate
AYUSH	Ayurveda, Yoga, Naturopathy, Unani, Siddha & Homeopathy
BMI	Body Mass Index
CHE	Current Health Expenditure
GGHE-D	Domestic General Government Health Expenditure
GAPPA	Global Action Plan on Physical Activity
GDP	Gross Domestic Product
HALE	Health-adjusted Life Expectancy/Healthy Life Expectancy
HWC	Health and Wellness Centers
IPA	Insufficient Physical Activity
MoHFW	Ministry of Health & Family Welfare
NCDs	Non Communicable Diseases
NFHS	National Family Health Survey
NHRM	National Rural Health Mission
NUHM	National Urban Health Mission
OECD	Organization for Economic Cooperation and Development
OOPE	Out of Pocket Expenditure
POSHAN	Prime Minister's Overreaching Scheme for Holistic Nourishment
SDG	Sustainable Development Goal
SDGS	Sustainable Development Goal Scores
UNO	United Nations Organization
WHO	World Health Organization

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ABSTRACT

The present study is conducted to investigate India's Health status, its progress and constraints, comparing with the health status of twenty three countries having the highest Gross Domestic Product (GDP > 5 lacks US$) in the World in 2021. Twenty four countries considered for this study are USA, China, Japan, Germany, UK, India, France, Italy, Canada, Korea Republic, Russian Federation, Brazil, Australia, Spain, Mexico, Indonesia, Netherlands, Saudi Arabia, Turkey, Switzerland, Poland, Sweden, Belgium and Thailand.

Health and health related indicators selected for the study are prevalence of insufficient physical activity, number of deaths from Non-Communicable Diseases (NCDs), children and adult mortality rate, healthy Life Expectancy (HALE), stunting, wasting, underweight and overweight prevalence, health expenditures, Out of Pocket expenditure and Sustainable Development Goal Score. Qualitative indicators are different health policies for promoting physical activities. All the data used for the study are from secondary sources with a time span 2010 to 2021 based on data availability. Most of the data is collected from open website of the WHO as well as the World Bank. Arithmetic annual average, Growth rate, Reduction rate, Average Annual Growth Rate, Average Annual Rate of Reduction and Predicted values based on AAGR and AARR of selected indicators are computed.

In India, the status of the most of the health indicators selected for the study is observed as very poor, concerning other countries. Annual average of Child Mortality, average prevalence of stunting children, prevalence of wasting children, average prevalence of underweight children and underweight adults are highest. HALE at birth and at 60 Yrs. is lowest. India also ranks as the 2nd highest country in average number of deaths from NCDs. The prevalence of insufficient physical activity in adult is also considerably higher. Despite higher initial values, India made little beat progress in Average Annual Rate of Reduction (AARR) in under five Children Mortality, stunting (U-5), children mortality (5-14Yrs.), adult mortality rate in female (15-60 yrs.), rate of Growth in Healthy life expectancy at birth and at 60 Yrs..

By the present trends, India will be far away from the global targets such as 15% relative reduction in the prevalence of insufficient physical activity, to reduce one third of the Premature Deaths from NCDs (SDG target 3.4.1) by 2030, to end Preventable Deaths of Children Under 5 Years of Age (SDG 3.2.1) by 2030 and to end all forms of Malnutrition by 2030 (SDG 2.2).

Average Per Capita Health expenditure and Average Domestic General Government Health expenditure are lowest in India. In addition, Out of Pocket expenditure for health is highest. A Positive association exists between HALE and Domestic General Government Health expenditure. India's direct health care cost attributable to NCD and mental health associated with Insufficient Physical Activity is approx. 322 crore US$ per year (Ranks as 4th highest country). To Create Active People, WHO emphasizes many policies along with the enhancement of Physical Education and school based programme and incorporation of Physical activity in health and social service.

Immediate bold steps to hike Per capita health expenditure and Domestic General Government Health Expenditure prioritizing intensive and life-course programme, action plans and awareness regarding active life style may change the scenario of India's health status in future.

Keywords: NCDs, Mortality, Insufficient Physical Activity, HALE, Health expenditure, SDGs.

CHAPTER- I

INTRODUCTION

1.1 General Introduction:

In Ayurveda the term "Health" describes by Sushrutacharya as " *Samadosha, samagnischa samadhatumalakriya, prasannatmenindriyamanaha swasthya ityabhidheeyate*".

Sushrutacharya describes the features of a healthy man, Doshas (Vata, Pitta, Kapha), Agni (digestive fire), Dhatus, Malas (waste products) and Kriyas are normal, Atma (soul), Indriya (sense organ) and Manas (mind) are peaceful is said to be healthy. Swastha (health) means all Doshas, Agni, Dhatus, Malas are in the state of equilibrium along with mental, sensory and spiritual pleasantness and happiness (Sushant Sukumar & Shashirekha, 2018, p. 3).

The concept of health in Ayurveda is similar to the concept of in modern text i.e. the definition of the health and quality of life given by World Health Organisation (Singh et al. 2016, p.458). Constitution of WHO, 22nd July 1946, declares " Health is a state of complete physical, mental and social well-being and not merely absence of disease or infirmity "(WHO. 1946, p.2).

Operational definition of health is a condition or quality of the human organism expressing the adequate functioning of the organism in given conditions, genetic or environmental. Dimensions of Health are Physical, Mental, Social, Spiritual, Emotional, Vocational and others, educational, cultural, philosophical, environmental etc.(Rai, 2016).

India has long traditional history towards health and medical service to its people mainly through AyurVeda (The science of Longevity), Shastrakarma (The art of Surgery) and Yoga (Health of Body and Mind) (Dubey et al. 2017, p.362).

Some evidences from ancient Indian culture also shows some advance health system. 'Hiuen Tsang (CE 629-645), an Chinese traveller contemporary with the emperor Harsha, provides a description about the hospitals of that time. According to him in all the highways of the towns and the villages throughout India there were 'hospices' (punya-salas). Those hospices were provided with food and drink as well as physicians with medicines that provide medical facilities to the travellers and poor people. These institutions that helped the poor and the needy people were also known by several other names such as punyasthanas, punyasalas, dharmasalas, viharas and maths.' The temple inscriptions of one of the temples (Venkateshwar at Tirumakudal district) of the Chola period gives a

detailed account including a description of a hospital, a medical school and a hostel for the students (Agrawal et al. 2011, p.18).

Before Independence, Colonial public health policy was inherently limited and self-limiting; it focused on keeping epidemics at bay, responding to crises and not much more (Amrith, Sunil S, 2009, p. 7). The first International Sanitary Conference was held in 1851, at Paris to control epidemics of Cholera, plague and yellow fever, with a representation of twelve European countries. After that 13th International Sanitary Conferences (also known as Quarantine, health and sanitary conferences) were held till 1926 to control and to prevent of spreading epidemics (of Cholera, yellow fever, plague, malaria, typhus and smallpox etc.) across the countries. The targets were threefold, namely to protect public health, prevent damage to trade and international relations and lay down quarantine regulations. During thirteenth International Sanitary Conference at Paris 1926, the convention was signed by India along with others countries (Ersoy et al., 2011, p. 53,71 & 72; Howard-Jones, N., & World Health Organization,1975).

To establish a new and comprehensive international health organisation, the proposal to convene an international conference was originated in 1945 at the United Nations Conference held in San Francisco. Then the process was started, after having several initiatives 'the Constitution of WHO' was adopted by the International Health Conference held in New York from 19 June to 22 July 1946, signed on 22 July 1946 by the representatives of 61 States and entered into force on 7 April 1948 with a very philanthropic objectives 'the attainment by all peoples of the highest possible level of health'. India was one of the representative of the 61 states having its delegates Lieutenant-Colonel C. K. Lakshmanan, All India Institute of Hygiene and Public Health, Calcutta, and Major C. MANI, I.M.S., Deputy Public Health Commissioner, New Delhi (World Health Organisation & Interim Commission, 1948,pp. 9, 98-100; WHO & Interim Commission, 1948,p.23).

'Right to Health' was committed by UNO by adopting and proclaiming 'Universal Declaration of Human Right' in General Assembly resolution 217 A (III) of 10th December 1948, article 25 states that- Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control. Motherhood and childhood are entitled to special care and assistance. All children, whether born in or out of wedlock, shall enjoy the same social protection (United Nations, 2002, pp. 1 & 5 ; United Nations, 2015).

UNO along with its agencies has been taking several initiatives and strategies towards the human development . The healthy people and the healthy World is the main concern of the future Planners.

'Health is an integral part of the development' was adopted by UNO general assembly resolution 34/58, in November 1979. In the same year, 'Health for all by the year 2000' the global strategy was adopted by The World health Assembly in 1979, Resolution WHA 32.30 (World Health Organization, 1981, p. 7 ; World Health Organization, 1980, p. 1).

In the year 2000 (6-8 September) in New York, United nations General Assembly adopted the United Nations Millennium Declaration (A/RES/55/2), with a view to reduce extreme poverty and targeting other issues through the eight Millennium Development Goals (MDGs), with a deadline of 2015 (Assembly, U. G. 2000, p.1; ADB,2009,P.81). In 2012, the World Health Assembly (by resolution 65.6) adopted Six Global targets out of which the three targets are: 40% reduction in the number of the children under 5 Yrs. who are stunted, to reduce and maintain childhood wasting to less than 5% and not to increase in childhood overweight, by 2025 (WHO, 2014).

MDGs end at December 2015, then, ' Transforming our World : the 2030 agenda for Sustainable Development' was adopted by UN General Assembly 25th September 2015 with a vision to make the World free from poverty, hunger, diseases and fear and violence , to make a world having universal literacy, equitable and universal access to quality education at all levels and to health care and protection where physical, social and mental wellbeing are assured and make a World where human habitats are safe, resilient and sustainable, by 2030 through fixing 17 sustainable Goals where goal 3 is adopted as ' to ensure healthy lives and promote well-being for all at all ages'. Emphasise was given on collective pursuit of global development and ' Win-Win' cooperation to bring huge gains to all countries. General Assembly, also stated "Sport is also an important enabler of sustainable development. We recognize the growing contribution of sport to the realization of development and peace in its promotion of tolerance and respect and the contributions it makes to the empowerment of women and of young people, individuals and communities as well as to health, education and social inclusion objectives." (United Nations, 2015, pp. 1-6 & 10).

Physical activity is a fundamental means of improving physical and mental health of individuals. " To increase the overall awareness and understanding of the influences of diet and physical activity on health and of the positive impact of preventive interventions" was one of four objectives of Global Strategy taken by WHO, in 2004 (*Global Strategy on Diet, Physical Activity, and Health*, 2004, p. 3).

'Global Action Plan for the prevention and control of non-communicable diseases, 2013 -2020 was taken by World Health Organisation in May 2013, with a vision to have a world free of the avoidable

burden of non-communicable diseases. Global target was fixed to 25% reduction in risk in premature mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases , 10% relative reduction in prevalence of insufficient physical activities, 25% relative reduction in the prevalence of raised blood pressure and halt the rise in diabetes and obesity (World Health Organization, 2013, p. 1,3 & 5).

Health is a multidimensional process involving the wellbeing of the person as a whole. Physical activity is life style and behavioural aspect of Health. The vision ' More active people for healthier World ' is adopted by WHO in 'Global Action Plan on Physical Activity, 2018-2030' (World Health Organization, 2018).

The Indian government adopted the 1st National Health Policy in 1983, after 36 years of independence, with a view to have ' Health for all by 2000 AD' through the universal provision of Comprehensive Primary Health Care services emphasizing preventive, promotive and rehabilitative aspects. As the goal could not be achieved by 2000 AD, revised and more obligatory '2nd National Health Policy' was taken in 2002. After 14 years of 2nd National Health Policy(2002), recognising the Sustainable Development Goals, the latest and 3rd National Health Policy developed by Ministry of Health and Family Welfare, in 2017, for achieving its goal for the attainment of the highest possible level of health and wellbeing for all at all ages, through a preventive and promotive health care orientation in all developmental policies where one of the seven priority areas of preventive and promotive health policy for improving environment for health is '**Balanced, healthy diets and regular exercise'**. Mainstreaming the potential of AYUSH was one of the objectives of the policy where **more importance was given on Practice and application of Yoga** (Ministry of Health and Family Welfare, Government of India,1983 ; MoHFW, Government of India, 2002 ; MoHFW, Government of India, 2017).

National Rural Health Mission(NHRM) was launched in India in 12th April 2005. Some objectives of that mission were to reduce Maternal Mortality Ration(MMR) from 407 to 100 in per 100000 live births and Infant Mortality Rate(IMR) from 60 to 30 in 1000 live births within 7 years and to have universal access to public services for food and nutrition, sanitation and hygiene and universal access to public health care system, prevention and control of communicable and non-communicable diseases, revitalize local health tradition and mainstreaming of AYUSH(Ayurveda, Yoga, Naturopathy, Unani, Siddha and Homeopathy) and promotion of healthy life styles. Since 2013, National Health Mission (NHM) consisted of two sub wings NHRM and NUHM. National Urban Health Mission, 2013 was launched by the Ministry of Health and Family welfare, Govt. of India, to improve the health status of urban population emphasizing poor and others disadvantaged sections through equitable

access to quality health care. NHM was extended from 1st April 2017 to 31st March 2020, further 1st April 2020 to 31st March 2021 and finally it was extended from 1st April 2021 to 31st march 2026. Some Targets under National Health Mission by 2025 are: reduction of Maternal Mortality Ratio (MMR) to 90/100000, reduction of Infant Mortality Rate (IMR) to 23/1000 live births, reduction of under-five Mortality Rate (U5MR) to 23/1000 live births and to reduce mortality and morbidity from communicable and non-communicable diseases (Ministry of Health and Family Welfare, 2006 ,pp. 5 & 15 ; MoHFW, GoI, 2013, p. 29 ; MoHFW and Government of Haryana, 2022, p. 2 ; Union Cabinet, Government of India, 2022).

The Prime Minister of India launched POSHAN Abhiyaan (Prime Minister's Overreaching Scheme for Holistic Nourishment) on 8th March 2018, with a budgetary allocation over 9000 crore (FY 2017-18 to 2019-2020) with a view to reduce numbers of stunting children, under-nutrition, anaemia and low birth weight(Niti Aayog, 2019).

To achieve Universal Health Coverage, India launched 'Ayushman Bharat' in 2018 targeting two components which are, setting up of 150000 Health and Wellness Centres (HWCs) by 2022 and delivering Pradhan Mantri Jan Arogya Yojana (PM-JAY). For promoting wellness through multi-sectoral convergence, preventive and promotive health care services were adopted **through regular Yoga sessions for the community at HWCs, partnering with Fit India movement and wellness through regular physical activities** (MoHFW, Government of India, 2019).

Health related physical fitness is a new concept emerged in USA, components of which are Body Composition(Associated with the relative amounts of muscle, fat, bone and other vital parts of the body.), Cardiovascular fitness (The ability of the circulatory and respiratory systems to supply oxygen during sustained physical activity), Flexibility (The range of motion available at a joint.), Muscular Endurance(The muscle's ability to continue to perform without fatigue.) and Muscle Strength (The ability of the muscle to exert force.). This concept is consisted with the literature of The American College of Sports Medicine, (ACSM- 1998),US Department of Health and Human Service(USDHHS-1996) and USDHHS-2000(Corbin et al. 2000).

FIT INDIA movement launched by Prime Minister of India on 29th August 2019 with a view to make physical fitness a way of life **(Ministry of Youth Affairs and Sports, Government of India, 2019).**

WHO stated that 'Physical activity is one of the major lifestyle-related health determinants. Physical activity should be recognized as a fundamental component of public health work.'(WHO, 2007).

"Global Action Plan on Physical Activity 2018-2030, More Active People for a Healthier World" was adopted by WHO, in 2018, fixing the target of 15% relative reduction in the Global Prevalence of physical inactivity in adults and in adolescents by 2030 through creating Active Societies, Active environments, Active people and Active system (World Health Organization, 2018, pp. 8–10).

The researcher wants to concise its efforts to analyse progress and constraints of Health in India in respect of other countries emphasizing some selected health and related indicators.

1.2 Rationale of the Study:

To promote health and wellbeing WHO along with other organisations adopted many action plans emphasizing behavioural health. Global Action Plan (2013-2020), for the prevention and control of non-communicable disease was taken by WHO, where one of the fixed targets **was 10% relative reduction** in prevalence of insufficient physical activity. Sports are incorporated to Sustainable Development Goals which were adopted by member states of UNO, 21st October 2015. "Global Action Plan on Physical Activity 2018-2030, **More Active People for a Healthier World**" was adopted by WHO, 2018, fixing the target of 15% relative reduction in the Global Prevalence of physical inactivity in adults and in adolescents by 2030. Prevention from diseases is being encouraged more than cure by WHO.

Physical activity is considered as a significant indicator to achieve SDG 3.4 (By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being), SDG 3.6 (To halve the number of global death and injuries from road traffic accident.), SDG 3.8 (To achieve universal health coverage.) and SDG 3.9 (To reduce number of deaths and illness from environmental pollution and illness.).

Human Development now is not confined to one or a few fields. All the fields like Health, Education, Economy, Environment and technology etc. are being prioritized together to achieve the Sustainable development Goals. Health is one of the most important global issues.

World Bank Data (2022) reflects that India ranks as the 6th largest economic country in respect of GDP in the World in the year 2019, 2020 and 2021. But as per Sustainable Development Report 2022 where all the 17 sustainable development goals are considered, India's SDG -index rank and score out of 163 countries are **121 and 60.3** respectively (Sachs et al., 2022). Less than one decade is in hand to achieve the SDGs targets in time i.e. by 2030. The major challenges remain in Good Health and Well-being also. So there is an emergence to evaluate the India's Health status emphasizing physical activity.

Dummer & Cook (2008) in their article, " Health in China and India: a cross-country comparison in a context of rapid globalisation." analysed the health care provision, policy and status of health in China and India, where prevalence of insufficient physical activity as behavioural aspect of the health and wellness is not taken into consideration.

Joumard & Kumar (2015) studied on Improving health outcomes & Health care in India, compared India's health indicators with peer emerging countries & OECD (Organisation for Economic Cooperation and Development). They highlighted the area such as Life expectancy at birth, Infant mortality rate, Estimated maternal mortality ratio, proportion of all causes of deaths, rate of vaccination, free access to health care, health care spending, Health care professional & Health insurance. But, the areas such as prevalence of insufficient physical inactivity, Healthy life expectancy and prevalence of Stunting, wasting & underweight children were remained untouched.

The Commonwealth (2015) analysed on Sport for development and peace and 2030 agenda for sustainable development in 2015. But current health expenditure and Out of Pocket expenditure are not covered.

Gupta & Sodani (2022) studied the health policy of eight selected countries from different geographical regions viz., Argentina, Australia, Finland, Kenya, India, South Korea, United Kingdom (U.K) and United States (U.S), but behavioural aspects of health like insufficient physical activities and healthy lifestyle are not addressed.

Dai & Menhas (2020) did review works on Sustainable development goals, sports and Physical activity, addressing health related SDGs through sport in China, but the field of Malnutrition, Healthy Life Expectancy and Health expenditure are not covered.

Several studies Adrani & Kerr (2022), Michael et al.(2019), Swift (2011) prove the association between Health & Gross Development Product and also between Sustainable Development and GDP.

Adrangi and Kerr (2022) in their article on Sustainable development indicators and their relation to GDP of five BRIC countries, concludes that GDP growth in BRICS countries leads to less gender equity (SDG-5), lower mortality rate (SDG-3) and increased emissions(SDG -12&13).

Michael et al. (2019) studied the impact of GDP growth on achieving Sustainable Development in Ghana and the outcomes of the study established the positive and strong association between GDP growth and Sustainable development in Ghana.

Swift (2011) studied the relationship between health and GDP in 13 OECD countries for the period ranging from 1820-2001 to 1921-2001 and concluded "In most of the countries tested, the long run relationships have led to significant increases in both total GDP and GDP per capita as life expectancy has increased, and to similar endogenous increases in life expectancy as GDP has risen."

As the Impact of GDP on health and finally on SDGs exists direct or indirectly, the highest GDP-ranked 24 countries whose GDPs are more than 5 lacks Million (As per World bank data 2022) are selected for present studies. The researcher wants to concise his efforts to analyse progress and constraints of Health in India in respect of other selected countries having highest Gross Development Product (GDP >5 lacks Million US$) in the year 2021 as per World Bank data 2022.

The present study emphasizes the status of different Health Indicators which includes physical inactivity, Non-communicable Diseases, Mortality rate, Health-adjusted Life Expectancy (HALE), Mal Nutrition children, Health Expenditure and related factors in selected 24 countries having highest GDP in the World.

1.3 Objectives of the Study:

The objectives of the research are:

1. To compare, analyse and evaluate health status of India with the other 23 countries having highest GDP(more than 5 lack million US$) in the World in 2021.
2. To find out the India's advancement and dis-advancement in health outcomes.
3. To point out the association among health expenditure and other health indicators.
4. To assess the feedback of India towards the global targets fixed by WHO/UNO.
5. To assess the future dimensions of Health and wellbeing emphasizing behavioural health and to seek national awareness and attention to physical activity as an important behavioural health determinant.
6. To point out different policies or strategies adopted by WHO and India for promoting physical activity.
7. To highlight the role of physical activity in respect of other Health Indicators.

1.4 Delimitation of the Study:

i. Only twenty four countries having GDP more than five lacks million US$ are selected for the study.
ii. Health indicators selected for the study are: **Physical inactivity, Non-communicable Diseases, Mortality rate, Health-adjusted Life Expectancy (HALE), Mal Nutrition children, Health Expenditure, Out of Pocket Expenditure and related evaluative indicator SDG index-score.**
iii. Geographical regions are not considered for present study.
iv. Only secondary data has been used.

1.5 Limitations of the Study:

i. Owing to vastness of data and information pertains to the study, the researcher has relied on the secondary data.
ii. Present study is conducted based on available data from the website of World Health Organization, World Bank, National Family Health Survey (Ministry of Health, India) and Sustainable Development Solution network(A World initiative of United nations)etc..
iii. Health outcomes are complex matter having both qualitative and quantitative natures. It is difficult to assess the concrete scenario through selected health indicators.
iv. Data of different health indicators along with Socio-economic data are continuously being updated by WHO and World bank. So the findings of the study have been prepared only based on the data retrieved on the particular duration.

1.6 Significance of the Study:

The significance of the research studies are as follows:

i. This works may help to identify the gaps between global planning and outcomes and its implementation to the selected member states.
ii. Research may contribute to further planning and to fix target in making policies for related fields.
iii. It will provide clear picture of India's present status, achievement and drawback in health in compare to other countries, emphasizing physical activity and related factors.
iv. It may act as a valuable source of reference for further studies.

1.7 Definition and Meaning of Related Terms:

Insufficient Physical Activity: Insufficient Physical Activity denotes less than 150 minutes of moderate-intensity activity per week, or equivalent in 18+ yrs. of age and less than 60 minutes of moderate to vigorous intensity activity daily for adolescent. Physical activity is identified as 'Any bodily movement produced by skeletal muscle that requires energy expenditure'. It may be exercised in different ways such as walking, cycling, sports and active forms of recreation (Dance, Yoga, Tai chi etc.) (World Health Organization, 2018,p.14).

Non-communicable Diseases (NCDs): Non-communicable diseases (NCDs) known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental & behavioural factors (WHO, 2022).

Mortality rate : Mortality rate may be defined as the number of deaths from a particular cause or during a particular period of time among a particular group of people (Cambridge University Press, n.d.).

Under five Mortality is defined by WHO as "The probability of a child born in a specific year or period dying before reaching the age of five". Under five mortality rate is expressed as number of deaths per 1000 live births (WHO, n.d.).

Children mortality rate (5-14 yrs.) refers to the probability that a child aged five dies before reaching its 15th birthday (WHO, n.d.).

Adult mortality rate is probability of that a 15 year old person will die before reaching his/her 60th birthday(WHO, n.d.).

Healthy Life Expectancy (HALE): WHO defines Healthy life expectancy as 'the average number of years that a person can expect to live in "full health" by taking into account the years lived in less than full health due to disease and/or injury'. Health-adjusted life expectancy or Healthy life expectancy (HALE) combines both mortality (Refers to number of death in particular population) and morbidity (Refers to state of being unhealthy)(Stibich,2022).

Stunting, Wasting, Underweight and Overweight Children: Malnutrition in all its forms threatens human health and development. Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients. Stunting refers to a child who is too short for his or her age, Wasting refers to a child who is too thin for his or her height, Underweight defined as low weight-for-age and Overweight refers to a child who is too heavy for his or her height; are the forms of malnutrition. Southern Asia has the highest stunting prevalence among the all sub-regions in the world (World Health Organization, 2021).

Gross Domestic Product (GDP): Gross Domestic Product (GDP) is the total value of goods and services that are newly produced in the economy during an accounting period, generated net incomes to the economy and are available for final uses or for exports (Viet, 2009, p. 4).

Health Expenditure: Health expenditure is the reflective of SDG 3 (To ensure healthy lives and to promote well-being for all at all ages). Health expenditure accounts all the expenditure for provision of health services, activities related to family planning , nutrition activities and emergency aid designated for health excluding the provision of drinking water and sanitation(WHO,n.d.).

Current Health expenditure as % of GDP shares information on the level of resources channelled to health, relative to a country's wealth and indicates the societal priority which health is given measured in monetary terms (WHO,n.d.).

Per capita current health expenditure reflects the total expenditure on health relative to population and expressed in US$ for international comparison (WHO, n.d.).

Domestic General Government Health Expenditure(GGHE-D) is the share of current health expenditure funded from general government sources and social health insurance. It indicates how much resources the public sector is devoting for health (WHO, n.d.).

Out-of-Pocket Expenditure: Out of pocket expenditure are the payments made by the patients to both public and private providers at the point of receiving health services, comprise a considerable part of total health spending (Heijink et.al.,2011). Out-of-pocket payments refer the expenditures borne directly by a patient where insurance does not cover the full cost of the health good or service (OECD, 2009).

Sustainable Development Goals (SDGs): In 1987, the World Commission on Environment and Development(WCED), known as Brundtland Commission, defined Sustainable Development as 'the development that meets the needs of the present without compromising the ability of future generation to meet their own needs'(World Commission on Environment and Development, 1987, p. 37).

According to WHO, in a broad term, Sustainable Development is to describe the policies, projects and investments that provide benefit today without sacrificing environmental, social and personal health and well-being in future. The benefits of sustainable development lie on human health and development including reductions in pollution and environment related disease, improved health outcomes and decreased stress (WHO, n.d.).

CHAPTER-II

REVIEW OF RELATED LITERATURE

Brief introduction: The investigator has tried to hunch all the previous literature closely related to the present study. All the related literatures are collected from website. Citation in APA format is done for each work in reference section.

Cross-Country Analysis : World Context

Ma & Sood (2008) in their paper " A comparison of Health Systems in China and India" concludes that as in health system performance, India's rank is 112th and China's rank is 144th out of 191 countries (report of WHO Ranking of Health System, 2000), China should consider two particular aspects of India's health care system which are greater private sector involvement and reduced regulation of prices. Other hand, in spite of having higher Rank, Indian health is far poorer. India should consider two lessons from Chinese health care system which are increased expenditure on health and better control of communicable diseases & improvements in maternal and infant health.

Dummer & Cook (2008) in their article, " Health in China and India: a cross-country comparison in a context of rapid globalisation" opined that in China and India specifically, globalisation is not just promoting wealth and opportunity, it is contributing to the emergence of diseases of affluence whilst failing to eradicate diseases of poverty. It will take sustained political will and social pressure to ensure that the millions facing disease and shortened life expectancy within China and India receive a greater share of the growing resources of each country; if these countries lead the way towards such redistribution, then the impact both within and beyond their borders will be substantial.

He at el.(2012) conducted a cross country study on health and wellbeing of the older population in six countries(China, Ghana, India, Mexico, Russia & South Africa) which were under the World Health Organisation's Study on global AGEing and adult health. The researcher examined ageing, demographic and socio-economic characteristics, Health state and chronic condition, risk factors and preventive health behaviours, disability, life satisfaction and quality of life, depression and health care utilization, and reported that hypertension(most common) and arthritis (2nd most common) prevail in SAGE (Study on Global AGEing and Adult Health) countries in 50-69 year olds. For six SAGE countries, older women had higher level of hypertension and depression than older men and in most of the SAGE countries, older women had higher level disability than older men. Older men had

higher level of health risk. Among the six countries China had the highest mean-health-score and India had the lowest mean-health-score.

Wani (2013) studied the health system in India to examine the status, problems and quality of health services in India and to compare the health system of India with China, Brazil, Australia, USA, Canada, Bangladesh and Pakistan. Health indicators selected for the study were Infant Mortality Rate(IMR), Under five Mortality Rate, Population Completely Immunized (%), Health expenditure as a percentage of GDP, Number of the Births by skilled attendants, Govt. share of total health expenditure(%), Govt. share of total Govt. health spending (%) and per capita spending in (US$). The researcher concluded that India has been scaling up with significant advances in health care system over last few decades in spite of having inefficiency to provide basic health care to people and suggested for strengthening and sustaining the private-public co-operation to make the system more active.

Jaacks et al.(2015) evaluated the recent trends in prevalence of underweight and overweight prevalence among girls having age 15-18 Yrs. in low and middle income countries. Data collected from Demographic and Health Survey (53 countries) and national surveys conducted in Indonesia, China , Vietnam, Brazil and Mexico. All analysis was conducted by STATA, version 13. They observed that in low and middle income countries (67% in rural area and 50% in urban area), underweight remained a significant concerns among the girls. South Asia had the highest prevalence of underweight, nearly twice that of the East Asia and the Pacific, and Sub-Saharan Africa with an annual increasing percentage 0.66% in rural areas. America and Caribbean had the highest prevalence of overweight in both urban and rural areas and it is increasing annually by 0.50%.

Jaman et al.(2017) studied on the association of total health expenditure with GDP and Life expectancy collecting sample from 'health bulletin 2011' and 'Sample Vital Registration System 2010' of Bangladesh. They concluded that total health expenditure is more sensitive to Gross Domestic Product rather than life expectancy of a country and suggested for further longitudinal study.

Lee et al. (2018) conducted an study regarding comparison of disability and morbidity in older adults having age 55 to 74 years, over 30 countries in the world using the harmonized data from Gateway to Global Aging Data and observed that both disability and morbidity varied significantly across the countries and considered that the level of economy was not the main driver of that difference. The researchers pointed out to identify the main contributors responsible for such cross-country differences to reduce existing gaps and to improve population health World-wide.

Oommen (2018) compared Indian Health care system with other countries in the World having different income levels by the Article ' Health Care System of India- A comparison with health indicators.'. Health indicators selected for the study were health expenditure, infant mortality rate, Maternal mortality rate, total fertility rate, institutional deliveries and number of children aged 12-23 months received full vaccinations. It was concluded that the Infant Mortality Rate and Maternal Mortality Rate are better for high income and middle income countries than India. India is having low level of public spending on health which leads to poor health status compared to other nations of the world. Countries like China, Srilanka and even Bangladesh have better health indices than India.

Almasi et al.(2019) studied spatial pattern of malnutrition in stunting, wasting and overweight using Geographic Information System in countries in the World and collecting data from the World Health Organisation from the year 2005 to 2016. Data was analysed by Arc/GIS 10.6 software. Findings showed that prevalence of stunting and wasting children under five years were mostly found in African and Asian countries but prevalence in overweight was found in more areas in the World.

Marshal et.al.(2019) analysed the trend in mortality and life expectancy in United Kingdom(UK) comparing with 21 countries with high incomes (Switzerland, Japan ,Iceland ,Norway, Sweden, Italy, Spain, Australia, Ireland, New Zealand, Netherlands, Canada, France, Austria, Denmark, Belgium, Finland, Greece, Germany, Portugal, United States). They opined that morality rates fell in both sexes at all ages in UK over the twentieth century. Improvement in mortality rate slowed in USA and comparable Western European countries also. Since 2011 low annual improvement in life expectancy is observed in UK comparing with other countries, particularly more in women. The researchers also detected the improvement of mortality rates in young but improvement in mortality rate slowed down in older ages. They found that the significant differences exist in UK by Socio-economic deprivation. Factors which are shaping the tendencies are obesity, smoking and misuse of alcohol and drugs. They suggested regular and consistence analysis of the factors which influence mortality.

Yesilaydin (2019) examined the differences in health indicators between efficient and inefficient countries of OECD countries (Organisation for Economic Co-operation and Development). At first the efficient and inefficient countries were detected on health status through FDEA (Fuzzy Data Envelopment Analysis), Wang, Greatbanks, and Yang's model. Then comparison between the groups was done by independent sample t-test for variable with normal distribution and Mann Whitney U test for variables with non-normal distribution. The three inputs variables directly affects health such as number of the Physicians, number of the total Hospital beds and Current expenditure on health,

four other factors considered as indirect health indicators (% of tobacco consumption of population aged over 15yrs who are daily smokers, % of children immunized measles, CO2 emission and secondary school enrolment) and the two output variables, life expectancy of total population at birth and infant mortality were selected for the analysis. Statistically significant difference was found between efficient and inefficient countries in the number of Physicians. No statistically significant difference was found between efficient and inefficient countries in current expenditure on health.

Dallmeyer et al.(2020) conducted a multidisciplinary , cross-national and longitudinal study on the aged people (50Yrs. and older, n=94267) from 16 European countries to find out the relationship between participation in physical activity and out of pocket health care costs. Data were collected from the Survey of Health, Ageing and Retirement (SHARE) in Europe. Survey covered the span 2004 to 2015. They gets result that only participation in physical activity more than once a week decreases the probability of incurring any Out of Pocket Cost significantly. Higher savings are found in men comparing with the Women. The researchers recommend the promotion of physical activity interventions targeting older people who are inactive.

Balkhi et al.(2021) conducted a time series analysis in Middle East North African counties (MENA) to assess the relationship between health expenditure and life expectancy at birth by cross country comparison for the period 1995 to 2015. Data analysed with the statistical tools for social studies were SPSS 22, IBM Corp, New work, NY, USA. They overall, concluded that health expenditure is an important factor in improving health outcomes in MENA region.

Welsh et al.(2021) conducted an study on trends in life expectancy and healthy life years at birth and 65 in the UK and other EU28 countries in 2008-2016. They calculated sex-specific Healthy Life Years (HLY) ,Unhealthy Life Years (ULY), mild and severe ULY at birth and at 65 between 2008 and 2016. They interpreted that UK's performance was poor in related to other EU28 countries after 2011 combining static life expectancy and reduction in healthy life years.

Gupta & Sodani (2022) studied the health policy of eight selected countries from different geographical regions viz, Argentina, Australia, Finland, Kenya, India, South Korea, United Kingdom (U.K), United States (U.S) and concluded that the topic of health policy is still in the early phases of acceptance and formulation. A significant amount of work still must be done before a structured health policy process can be put into effect in future having involvement of academic research, political consensus and guidance from various key stakeholders, which, if successful, would encourage national ownership of the problem and produce a scenario in which all private and public stakeholders including citizens would work together.

Escribano et al. (2022) examined the health spending efficiency across the countries in particular among selected Emerging Markets (Ems), Low-income developing countries (LIDCs) and Advance Economies(AEs) and other related composite Health index. They concluded " COVID-19 has challenged countries across the world to step up health care spending, not only to weather the storm of the current crisis, but also to ensure progress toward the SDGs in the area of health. Over the last decades, inefficiency in health spending has reduced, but some LIDCs and EMs had a regress." The researchers also highlighted that the policymakers can improve health spending efficiency by increasing the allocation of spending towards essential health coverage, reducing income inequality and fighting corruption.

Fonseca et al. (2022) studied differences in health status and health expenditure in U.S. and seven European countries. They concluded that health prices in United States were estimated 33% higher than those of European countries. To them, those differences explained more than 60% differences in health expenditure and more than half of the difference in health status between Europe & U.S. The researchers also observed that the estimated prices are negatively correlated with a measure in competition (in health sectors), the intensity of price regulation and incentives for quality care. Estimates of unobserved health risks were strongly correlated with an index of risky behaviour comprising obesity, smoking, drug abuse and physical inactivity.

In Indian Context:

Farahani et al. (2010) tried to estimate the effect of state level public health spending on mortality across all age groups. Data of Mortality in all ages of 26 states in India collected from the reports of National Family Health Survey II (NFHS-II). They identified the significant impact of public spending on the probability of dying in India. Their study estimates a 10 % increase in public spending on health decreases the average probability of death by about 2%, having effects mainly on the young, the elderly, and women.

Anjana et.al. (2014) conducted a study on physical activity and inactivity patterns in India. 14227 individuals aged ≥ 20 yrs.(both sex) from four states (Tamilnadu, Maharastra, Jharkhand and Chandigarh) in India were considered for the study. Out of 14227 individuals 7737 (54.4%) were found as inactive, (Male-41.7%), 4537 (31.9%) were active (male 58.3%) and 1953 (13.7%) were highly active (male 61.3%). They suggested the urgent steps to promote physical activities.

Narain (2016) studied health challenges in India and one of his suggestion for India's health reform through his article 'Public Health Challenges in India: Seizing the Opportunities.', was 'investing more in health and recognising disease prevention and health promotion as the topmost priority.'.

Singh et al. (2017) studied the trends in inequality in length of life in India and 15 states in India. Life table Gini Coefficient (G_0) is used to measure the inequality in length of life. Data was collected from Sample Registration System(SRS) under the office of the Register General of India for the period 1981 to 2011. They found that the life expectancy at birth had increased 55 yrs. to 71 years between 1981 and 2011 but G_0 of life expectancy registered a decline during that period. G_0 for men was highest in Uttarpradesh and was lowest in Kerala. G_0 for Karnataka, Maharastra was lower than that of National average and in Haryana, Rajasthan, Uttarpradesh, Madhyapradesh and Odisha it is higher than the national average.

Luhar et al.(2020) predicted the prevalence of overweight and obesity in India by 2040. They estimated the incidence and initial prevalence of overweight taking data from National Family Health Survey, NFSH 3(2005-06) and NFSH 4(2015-16) and the Study on global AGEing and adult Health (SAGE). Lee-Carter Model fitted life tables were used to forecast future mortality. Multi -State life tables System was applied to forecast prevalence of Overweight and Obesity among Indians aged 20-69 Yrs. Their study predicted that between 2010 to 2040 overweight prevalence will be more than double and obesity will be triple among the Indian adults aged 20-69 years. Prevalence of overweight and obesity was forecasted to remain higher in urban areas compared to rural areas having 32.3% and 19.7% in urban Women (Rural 24% and 10%) respectively and 37.1% and 11.4% among urban men(Rural 25.6% and 8.2%) respectively by 2040.

Hemlatha et al.(2020) assessed the trend of Child growth failure (CGF) indicators which are stunting wasting and underweight, across all districts in India from 2000-2017 using all accessible data from various surveys and categorising the states into three groups based on the Socio-demographic Index (SDI) level which was calculated as the part of the Global Burden Disease Study considering per capita income, mean education and fertility rate in women having less than 25 Yrs. They assessed that stunting prevalence in India decreased from 55.8% to 47.3% from 2000 to 2010 and 39.3% in 2017. Wasting prevalence decreased modestly from 19.2% to 17.1% from 2000 to 2010 and 15.7% in 2017. Underweight prevalence declines from 53.4% to 40.9% from 2000 to 2010 and 32.7% in 2017.

Podder et al.(2021) analysed the Physical activity patterns in India stratified by zones, age, region, BMI and implication for Covid-19 where a nationwide study (29 states & Union Territories taken under study excluding Daman & Diu, Dadra, Sikkim, Nagaland & Lakshadweep) was conducted on

233805 adult individuals (18+yrs.) during Niyantrita Madhumeha Bharata (NMB) 2017 trial (Phase-I). Around 20.3% of Indian population were found inactive, 36.9% were mildly active, 27.8% were found as moderately active and 15.1% were vigorously active and finally 57% of population do not meet the physical activity regimen recommended by World Health Organisation. The researchers suggested to adopt the four strategic objectives i.e. Active Societies, Active Environment, Active People and Active System; recommended by The WHO for reduction of prevalence of physical inactivity.

Pandurangi et al. (2022) assessed the burden of stunting, thinness, overweight and obesity and their associated socio-demographic factors among Indian adolescent (10-19 Yrs.) using individual data of 35831 adolescent from the Comprehensive National Nutritional Survey (CNNS 2016-18) data. The researchers estimated the burden of stunting, thinness, overweight and obesity as 27.4%, 24.4%, 4.8 and 1.1 % respectively.

CHAPTER-III

METHODOLOGY

3.1 Research Design:

Both Quantitative and qualitative approaches are adopted to analyse the health status of India in respect of other UNO countries having higher GDP based on the year 2021 as per World Bank Data. As per World GDP Ranking , 2021, twenty four top most GDP-ranked countries including India is considered for the study. Countries considered for the present study are United States, China**,** Japan, Germany, United Kingdom, India, France, Italy, Canada, Korea Republic, Russian Federation, Brazil, Australia, Spain, Mexico, Indonesia, Netherlands, Saudi Arabia, Turkey, Switzerland, Poland, Sweden, Belgium and Thailand.

Quantitative Health and health related Indicators selected for the study are as follows:

i. Prevalence of Insufficient Physical Activity among School going adolescent 11-17 yrs.(%).
ii. Prevalence of IPA among adults 18+ yrs. (%).
iii. Total NCD (Non-Communicable Disease) Death (in thousand).
iv. Child & Adult Mortality Rate.
v. Healthy life expectancy (HALE) at birth,(yrs.).
vi. Healthy life expectancy (HALE) at 60 (yrs.).
vii. Stunting, wasting, underweight and overweight Prevalence among children and adult.
viii. Health Expenditure: Current Health Expenditure (% of GDP), Per capita health expenditure and Domestic General Government Health expenditure.
ix. Out-of Pocket Expenditure as percentage of current Health Expenditure (CHE) %.
x. Sustainable Development Index Scores (SDG-Index- Scores).

Qualitative Indicators related to insufficient physical activities are:

i. Existence of operation Policy/Strategy/Action Plan to Reduce Physical inactivity. (Y/N).
ii. Implementation of Physical Activity Public Awareness Programme. (Y/N).
iii. Existence of tax incentives to promote physical activity 2021. (Y/N).
iv. Existence of Policy promoting physical activity: Workplace initiatives, 2021. (Y/N)
v. Existence of Policy promoting physical activity: Childcare settings,2021. (Y/N)
vi. Existence of Policy promoting physical activity: active ageing, 2021. (Y/N)
vii. Existence of National guidelines for physical activity for older adults, 2021. (Y/N)
viii. Existence of Policy promoting physical activity: community-based & sports initiatives, 2021. (Y/N).

3.2 Collection of Data:

Most of the data is collected from the website of the World Health Organisation and of the World Bank. Quantitative data is taken as year wise from 2010 to 2021 depending upon the data availability. Qualitative data regarding insufficient physical activities, is collected as 'Yes/No' response-format from the website of the World Health Organisation. The Source of data is the website of the World Health Organization, The World Bank, Sustainable Development Solution Network, A Global initiatives for the United Nations, https://sustainabledevelopment.report , Website of NIti Aayog, Govt. of India, Ministry of Health and Family Welfare, Government Of India, and other related websites for the purpose of the study.

All the data collected are secondary. Data which are selected, collected, estimated, computed and analyzed for this research purposes only for the sole interest of educational purposes and no professional interventions or profit making organizational interest are associated for this purpose.

3.3 Criterion Measures:

Health Indicators are taken for the studies are measured by WHO , World Bank and Sustainable Development Solution network and data of related health indicators are used as secondary data.

Insufficient Physical activity is determined as percentage of population having less than 150 minutes moderate intensity of physical activity per week or having less than 75 minutes rigorous intensity of physical activity in a week or equivalent for adult 18+, and having less than 60 minutes moderate to vigorous activity daily in 11-17 yrs. as WHO recommended the levels of Physical Activity for Health in the year 2010 and 2020. Method of estimation is Global Physical Activity Questionnaire (GPAQ) (WHO, 2018).

Qualitative data indicators regarding the existence of Policy Promoting Physical Activity are estimated by World Health Organisation through official country response to the WHO NCD Country Capacity Survey (WHO,2022).

Deaths from Non Communicable Diseases accounts how many people die each year by cause and by age and sex. Method of estimation is WHO Global Health Estimates (WHO,2021).

Children and Adult Mortality Rate : Under Five mortality rate is measured as probability of death before reaching five years of age per 1000 live births(WHO,2021). Children mortality rate (5-14 yrs.) is measured as probability of dying per 1000 children aged 5-14 yrs. Most frequent methods used are Civil Registration, Census and Surveys. Number of deaths at age 5-14 and population of the same

age are used to calculate death rates which are then converted into age-specific probability of dying in case of civil registration(WHO, 2021). Adult mortality rate is measured as probability of dying per 1000 adult between 15 to 60 yrs. by Civil Registration(WHO,2018).

HALE measures the expected number of remaining years of life spent in good health from a particular age (at birth or at 60 years) assuming the rates of both mortality and morbidity remain unchanged. WHO considers HALE as an important assessment tool for health and well-being (Stibich,2022).

Stunting, wasting, underweight and overweight Prevalence among children under 5 yrs. age are estimated by WHO based on standardised methodology used by WHO Child Growth Standards and also based on UNICEF-WHO-The World Bank Joint child malnutrition estimates-Levels and trends (UNICEF/WHO/WB 2021 edition)(WHO, 2020; WHO,2021; WHO,2022).

Prevalence of underweight among children and adolescent are measured by WHO based on measured height and weight of population with a BMI less than 2 SD below the median (WHO references for school age children and adolescents)(WHO, 2017).

Prevalence of underweight among adult is measured based on height and weight as % of adult having BMI less than 18.5 kg/m^2 (WHO, 2017).

Prevalence of overweight among children and adolescent are measured by WHO based on measured height and weight of population with a BMI greater than 1 SD above the median (WHO references for school age children & adolescents)(WHO,2017).

Prevalence of overweight among adult is measured based on height and weight as % of adult having age more than eighteen years with a BMI 25 kg/m^2 or higher(WHO,2017).

Current Health Expenditure is measured as percentage of Gross Domestic Product (CHE/GDP). Unit of Measurement is %. Per Capita Health Expenditure is measured as Current Health Expenditure (CHE)/ Population. Domestic General Government Health Expenditure(GGHE-D) is measured as sum of Government Domestic Revenue allocated to Health purposes(FS1) and Social insurance contribution(FS3) divided by current Health Expenditure(CHE) (WHO,n.d).

WHO considers Out of Pocket expenditure as a core indicator of health financing system. It expressed as a percentage of total health expenditure. It is measured as HF3 Household out-of-pocket payments / Current health expenditure (CHE). HF3(Health Financing) denotes a categorical

expenditure paid by the households or individuals at the point of receiving health services (WHO, 2021 ; NHSRC, 2018).

Sustainable Development Goal Index is a method of assessment of each country's overall performance accounting the 17 Sustainable Development Goals having equal weight to each Goal. The SDG score determines the position of a country between the worst possible outcome (score of 0) and the target (Score of 100). (Sachs et al., 2022, p. 9).

3.4 Statistical Procedure:

Arithmetic Average, Average Annual Growth Rate(AAGR) , Average Annual Rate of Reduction(AARR), Growth rate, Reduction rate, Projected or predicted value (based on AAGR and AARR) and Correlation for selected indicators are performed to compare, to assess the trends of Growth or reduction rate of the health indicators and to find out the association. Representation of available data is done through Table and Figure to compare the status of health indicators selected for the study. Most the quantitative data are computed with the help of Microsoft excel 2010.

CHAPTER - IV

FINDINGS AND DISCUSSION

Data analysis is done on available secondary data. Derived findings are presented through the tables and figures. In case of some figure quantitative values written for only both sex. Finally Discussion is given in brief.

4.1 FINDINGS:

4.1.1 Insufficient Physical Activity (IPA):

Table 4.1.1.1

Prevalence of IPA Among School Going Adolescent (11-17 yrs.)(%) for the Year 2010 and 2016

SL No.	COUNTRIES	YEAR 2010			YEAR 2016		
		Both Sex	Male	Female	Both Sex	Male	Female
1	**United States**	73.51	66.84	80.57	72.05	63.96	80.50
2	**China**	84.72	80.99	88.92	84.27	80.09	89.09
3	**Japan**	-	-	-	-	-	-
4	**Germany**	83.61	79.62	87.81	83.69	79.69	87.91
5	**United Kingdom**	80.21	75.29	85.34	79.91	74.66	85.41
6	**India**	75.03	73.77	76.44	73.93	71.78	76.32
7	**France**	86.66	81.90	91.64	87.00	82.42	91.79
8	**Italy**	87.87	84.78	91.13	88.62	85.94	91.46
9	**Canada**	77.08	71.99	82.41	76.26	70.50	82.36
10	**Korea Republic**	93.61	90.51	97.05	94.18	91.38	97.20
11	**Russian Federation**	84.10	80.21	88.20	84.53	80.91	88.34
12	**Brazil**	83.98	78.86	89.29	83.59	77.99	89.39
13	**Australia**	88.25	85.52	91.18	89.02	86.76	91.40
14	**Spain**	77.64	71.70	83.92	76.61	69.79	83.83
15	**Mexico**	83.49	79.53	87.59	83.17	78.84	87.64
16	**Indonesia**	86.29	85.30	87.32	86.38	85.43	87.38
17	**Netherlands**	80.27	76.94	83.75	80.17	76.59	83.93
18	**Saudi Arabia**	-	-	-	-	-	-
19	**Turkey**	81.68	77.46	86.05	81.28	76.63	86.11
20	**Switzerland**	85.28	81.90	88.85	85.71	82.52	89.06
21	**Poland**	79.18	74.35	84.25	78.83	73.73	84.20
22	**Sweden**	84.26	81.56	87.11	84.67	82.16	87.33
23	**Belgium**	83.51	79.25	87.96	83.49	79.22	87.97
24	**Thailand**	79.21	73.44	85.13	77.47	70.22	84.99

Source: WHO website, Global Health Observatory, *(-) Data of Japan & Saudi Arabia not available.
Last Updated by WHO 14-11-2019 (estimated on basic population year 2010.)

Table 4.1.1.2

Reduction Rate of IPA Among School Going Adolescent (11-17 Yrs.) Between 2010 and 2016 (Higher to Lower Values) in (%)

SL No.	COUNTRIES	Both Sex	COUMTRIES	Male	COUMTRIES	Female
1	**Thailand**	2.197	**Thailand**	4.385	**Thailand**	0.164
2	**United States**	1.986	**United States**	4.309	**India**	0.157
3	**India**	1.466	**India**	2.698	**Spain**	0.107
4	**Spain**	1.327	**Spain**	2.664	**United States**	0.087
5	**Canada**	1.064	**Canada**	2.070	**Canada**	0.061
6	**China**	0.531	**China**	1.111	**Poland**	0.059
7	**Turkey**	0.490	**Brazil**	1.103	**Belgium**	-0.011
8	**Brazil**	0.464	**Turkey**	1.072	**Mexico**	-0.057
9	**Poland**	0.442	**Mexico**	0.868	**Indonesia**	-0.069
10	**Mexico**	0.383	**United Kingdom**	0.837	**Turkey**	-0.070
11	**United Kingdom**	0.374	**Poland**	0.834	**United Kingdom**	-0.082
12	**Netherlands**	0.125	**Netherlands**	0.455	**Brazil**	-0.112
13	**Belgium**	0.024	**Belgium**	0.038	**Germany**	-0.114
14	**Germany**	-0.096	**Germany**	-0.088	**Korea Republic**	-0.155
15	**Indonesia**	-0.104	**Indonesia**	-0.152	**Russian Federation**	-0.159
16	**France**	-0.392	**France**	-0.635	**France**	-0.164
17	**Sweden**	-0.487	**Sweden**	-0.736	**China**	-0.191
18	**Switzerland**	-0.504	**Switzerland**	-0.757	**Netherlands**	-0.215
19	**Russian Federation**	-0.511	**Russian Federation**	-0.873	**Switzerland**	-0.236
20	**Korea Republic**	-0.609	**Korea Republic**	-0.961	**Australia**	-0.241
21	**Italy**	-0.854	**Italy**	-1.368	**Sweden**	-0.253
22	**Australia**	-0.873	**Australia**	-1.450	**Italy**	-0.362

Data interpreted from data obtained from WHO website, Global Health observatory,
Last updated by WHO on 14-11-2019

Table 4.1.1.3

Average Prevalence of IPA Among School Going Adolescent (11-17 Yrs.) (%) from 2010-2016 (Highest to Lowest Value)

SL No	COUNTRIES	BOTH SEX		COUNTRIES	MALE		COUNTRIES	FEMALE
1	**Korea Republic**	93.90		**Korea Republic**	90.95		**Korea Republic**	97.13
2	**Australia**	88.64		**Australia**	86.15		**France**	91.71
3	**Italy**	88.25		**Indonesia**	85.51		**Italy**	91.29
4	**France**	86.83		**Italy**	85.35		**Australia**	91.29
5	**Indonesia**	86.33		**Switzerland**	82.21		**Brazil**	89.34
6	**Switzerland**	85.49		**France**	82.16		**China**	89.01
7	**China**	84.50		**Sweden**	81.86		**Switzerland**	88.96
8	**Sweden**	84.46		**Russian Federation**	80.56		**Russian Federation**	88.27
9	**Russian Federation**	84.32		**China**	80.54		**Belgium**	87.96
10	**Brazil**	83.79		**Germany**	79.66		**Germany**	87.86
11	**Germany**	83.65		**Belgium**	79.23		**Mexico**	87.61
12	**Belgium**	83.50		**Mexico**	79.19		**Indonesia**	87.35
13	**Mexico**	83.33		**Brazil**	78.43		**Sweden**	87.22
14	**Turkey**	81.48		**Turkey**	77.05		**Turkey**	86.08
15	**Netherlands**	80.22		**Netherlands**	76.77		**United Kingdom**	85.38
16	**United Kingdom**	80.06		**United Kingdom**	74.97		**Thailand**	85.06
17	**Poland**	79.00		**Poland**	74.04		**Poland**	84.22
18	**Thailand**	78.35		**India**	72.78		**Spain**	83.87
19	**Spain**	77.13		**Thailand**	71.84		**Netherlands**	83.84
20	**Canada**	76.67		**Canada**	71.25		**Canada**	82.39
21	**India**	74.48		**Spain**	70.75		**United States**	80.53
22	**United States**	72.78		**United States**	65.41		**India**	76.38

Data computed from WHO Global observatory (Last updated on 14.11.2019)
Data of Japan & Saudi Arabia not available

Table 4.1.1.4

Average Annual Rate of Reduction in IPA Among School Going Adolescent (11-17yrs), (2010 to 2016) (%)

SL No.	AARR of IPA Among School Going Adolescent (11-17YYrs.)(%), (2010 to 2016) (Highest To Lowest value)							
	Countries	**Both Sex**		**Countries**	**Male**		**Countries**	**Female**
1	**Thailand**	0.370		**Thailand**	0.744		**Thailand**	0.027
2	**United States**	0.334		**United States**	0.731		**India**	0.026
3	**India**	0.246		**India**	0.455		**Spain**	0.018
4	**Spain**	0.222		**Spain**	0.449		**United States**	0.014
5	**Canada**	0.178		**Canada**	0.348		**Canada**	0.010
6	**China**	0.089		**China**	0.186		**Poland**	0.010
7	**Turkey**	0.082		**Brazil**	0.185		**Belgium**	-0.002
8	**Brazil**	0.078		**Turkey**	0.179		**Mexico**	-0.010
9	**Poland**	0.074		**Mexico**	0.145		**Indonesia**	-0.011
10	**Mexico**	0.064		**United Kingdom**	0.140		**Turkey**	-0.012
11	**United Kingdom**	0.062		**Poland**	0.139		**United Kingdom**	-0.014
12	**Netherlands**	0.021		**Netherlands**	0.076		**Brazil**	-0.019
13	**Belgium**	0.004		**Belgium**	0.006		**Germany**	-0.019
14	**Germany**	-0.016		**Germany**	-0.015		**Korea Republic**	-0.026
15	**Indonesia**	-0.017		**Indonesia**	-0.028		**Russian Federation**	-0.026
16	**France**	-0.065		**France**	-0.106		**France**	-0.027
17	**Sweden**	-0.081		**Sweden**	-0.122		**China**	-0.032
18	**Switzerland**	-0.084		**Switzerland**	-0.126		**Netherlands**	-0.036
19	**Russian Federation**	-0.085		**Russian Federation**	-0.145		**Switzerland**	-0.039
20	**Korea Republic**	-0.101		**Korea Republic**	-0.160		**Australia**	-0.040
21	**Italy**	-0.142		**Italy**	-0.227		**Sweden**	-0.042
22	**Australia**	-0.145		**Australia**	-0.240		**Italy**	-0.060

Data computed from WHO Global observatory (14.112019)
Data of Japan & Saudi Arabia not available

Figure 4.1.1.1

Prevalence of Average IPA Among School Going Adolescent (11-17 yrs.) from 2010 to 2016

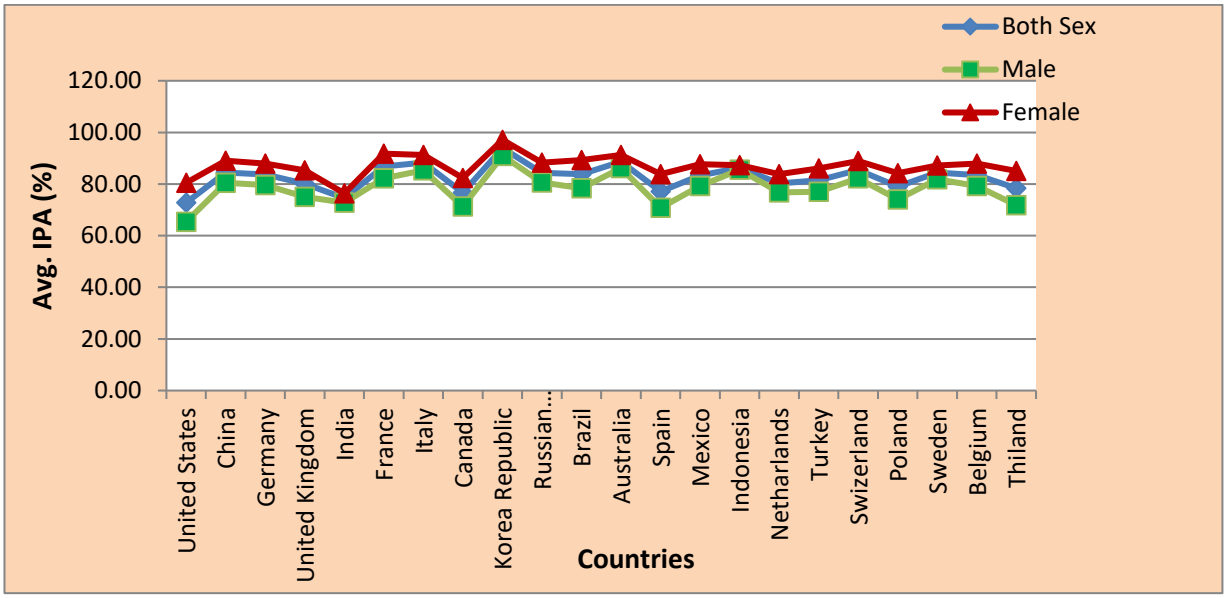


Figure 4.1.1.2

Average Annual Rate of Reduction in IPA Among School Going Children from 2010-2016 (%)

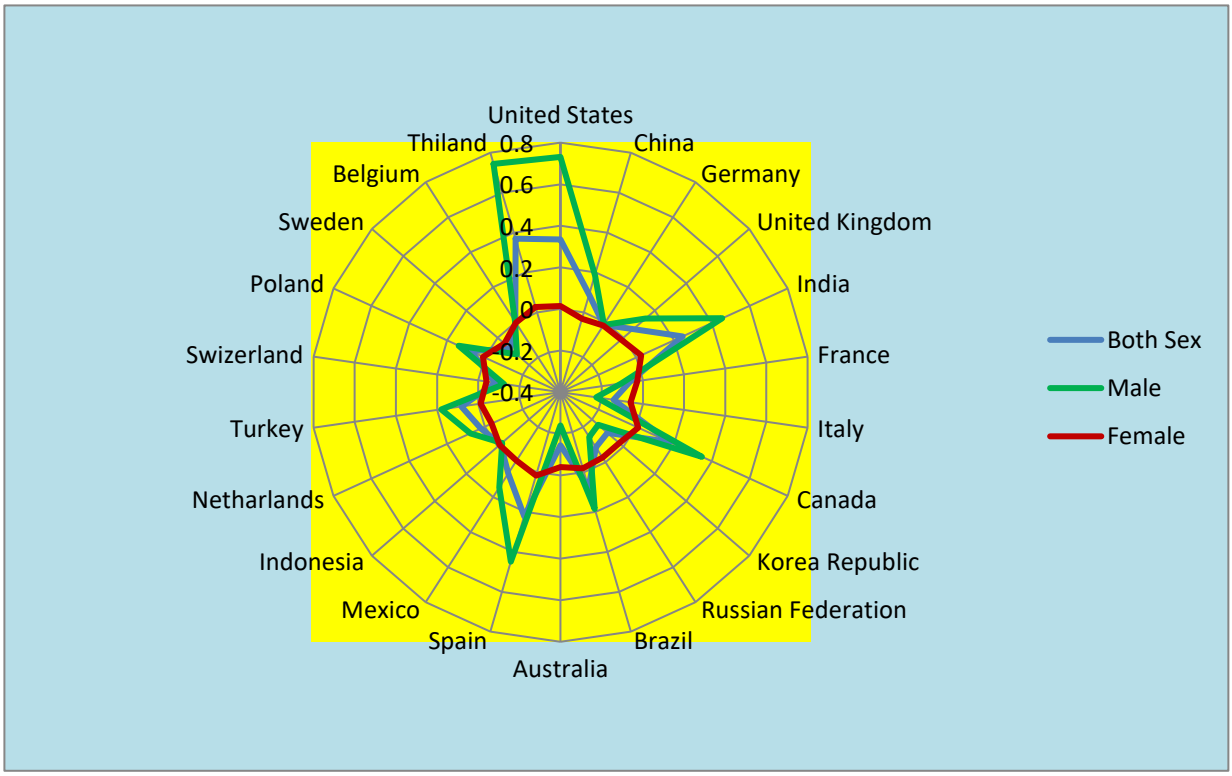


Table 4.1.1.1 and 4.1.1.3 show Korea Republic possessed the highest average percentage in prevalence of Insufficient Physical Activity in school going adolescent (11-17yrs) in the year 2010 and 2016 for both sex, male and female among selected countries. United States possesses lowest values for both sex and male. India occupies the lowest rank in 2010 and 2016 for female category having values 76.44 & 76.32 respectively. Also highest average percentage of IPA is found in Korea Republic from 2010 to 2016 having the values 93.90, 90.95 and 97.13 for both sex, male and female respectively. United States of America had the lowest average percentage of IPA from 2010 to 2016 having values 72.78 and 65.41 for both sex and for male. India had the lowest average value of IPA (2010 to 2016) for Female school going adolescent (11-17yrs) having value 76.38. Australia ranked as 2nd highest country in average percentage of Insufficient Physical Activity from 2010 to 2016 among school going adolescent (11-17 Yrs.) among selected countries for both sex and for Male with values 88.64 and 86.15 respectively, but France ranked as 2nd highest in Female category with the percentage 91.71.

Table 4.1.1.1 to 4.1.1.3 and Figure 4.1.1.1 also reflect that there are no considerable improvement in rate reduction of IPA (11-17 yrs.) in most of the selected countries between 2010 and in 2016. It is also noticed that the percentage of prevalence of insufficient Physical activity in female school going adolescent is higher than that of male for all selected countries for both years 2010 and 2016. Same trend also exists in Average percentage of IPA in school going adolescent from 2010 to 2016.

Table 4.1.1.4 and Figure 4.1.1.2 show that the Average Annual Rate of Reduction in IPA from2010 to 2016 among school going adolescent for some countries among all selected countries are very poor and some countries shows negative decreasing tendencies . Thailand had highest AARR in IPA from 2010 to 2016 for both sex, for male and for female having scores 0.37, 0.744 & 0.027. United States of America stands for 2nd highest AARR of IPA among the school going adolescent(11-17 yrs.) from 2010 to 2016 for both sex and for male having values 0.334 & 0.731) but India had the 2nd highest AARR for Female school going adolescent with value 0.026%(actual). Increasing tendencies in percentage of prevalence in IPA among school going adolescent (11-17yrs) from 2010 to 2016 are found for both sex and for Male category in case of (09 countries out of 22) Germany, France, Indonesia, Sweden, Switzerland , Russian Federation, Korea Republic, Italy & Australia, and for female category in case of (16 countries out of 22) Italy, Sweden, Australia, Switzerland, Netherlands, China, France, Russian Federation, Korea republic, Germany, Brazil, United Kingdom, turkey, Indonesia, Mexico and Belgium.

Table 4.1.1.5

Prevalence of IPA Among Adult (18+ Yrs.) for the Year 2016 (Age Standardized Estimate)(%) (Highest to Lowest values)

SL. No.	COUNTRIES	Both Sex		COUNTRIES	Male		COUNTRIES	Female
1	Saudi Arabia	53.14		Saudi Arabia	44.91		Saudi Arabia	65.1
2	Brazil	47.02		Brazil	40.37		Brazil	53.28
3	Germany	42.21		Germany	40.18		United States	48.02
4	Italy	41.39		Italy	36.17		Italy	46.23
5	United States	40.01		Japan	33.84		Germany	44.13
6	United Kingdom	35.86		United States	31.72		India	43.89
7	Belgium	35.75		United Kingdom	31.51		Korea Republic	40.99
8	Japan	35.47		Poland	31.48		Belgium	40.62
9	Korea Republic	35.35		Belgium	30.63		United Kingdom	40.01
10	India	34.03		Korea Republic	29.55		Turkey	38.8
11	Poland	32.46		Australia	27.04		Japan	36.98
12	Turkey	30.56		Canada	25.72		France	33.99
13	Australia	30.37		Mexico	25.47		Australia	33.64
14	France	29.32		Netherlands	25.29		Poland	33.36
15	Mexico	28.89		India	24.7		Mexico	32.19
16	Canada	28.6		France	24.26		Canada	31.38
17	Netherlands	27.18		Indonesia	23.46		Spain	30.52
18	Spain	26.81		Spain	22.87		Netherlands	29.01
19	Thailand	24.58		Thailand	21.79		Thailand	27.25
20	Switzerland	23.75		Turkey	21.74		Switzerland	25.71
21	Sweden	23.13		Switzerland	21.71		Sweden	24.73
22	Indonesia	22.57		Sweden	21.51		Indonesia	21.69
23	Russian Federation	17.12		Russian Federation	16.55		Russian Federation	17.6
24	China	14.11		China	15.96		China	12.19
WHO, Global Health observatory, last up dated 05/11/2018								

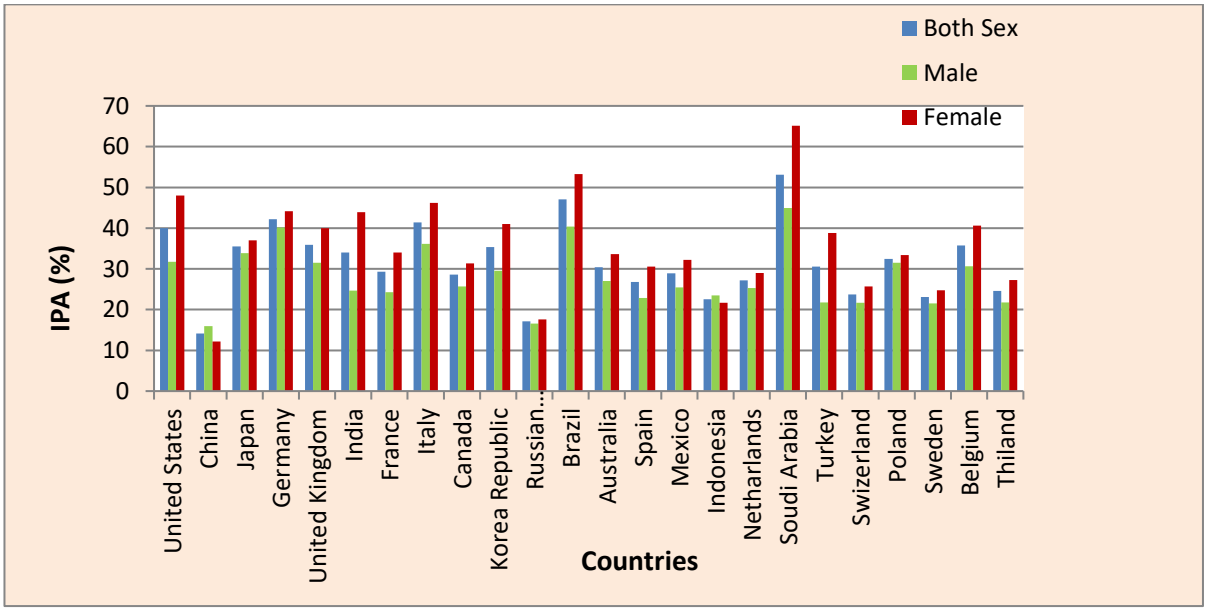
Table 4.1.1.5 and figure 4.1.1.3 speak that regarding Prevalence of IPA among adult (18+ yrs.) for the year 2016 reveals that among 24 selected countries Saudi Arabia is facing with highest % of IPA having values 53.14, 44.91 and 65.1 for both sex, for male and for female category. Brazil ranks as 2nd highest % of IPA (18+ yrs.) having scores 47.02, 40.37 and 53.28 for both sex, for male and for female category. Germany is having with 3rd highest % of IPA for Both sex and for Male, but for female category United states possesses the 3rd highest % of IPA.

The lowest % of IPA (18+ Yrs.) among 24 countries is observed in China having values 14.11, 15.96 and 12.19 for both sex, for male and for female categories. It also observed that % of IPA in adult female in china is lesser than that of male and same trend is also observed in case of Indonesia having values 23.46 and 21.69 for male and Female percentage respectively. For other 22 countries

Female percentages are higher than male percentages. Russian Federation stands for 2nd lowest % of IPA in adult having values 17.12, 16.55 and 17.60 for both sex, for male and for female category.

Figure 4.1.1.3

Prevalence of IPA among Adult (18 + Yrs.) In 2016 (%)



India ranks as 10th highest % of IPA in adult (18+ yrs.) among 24 countries for both sex having values 34.03, and ranks as 15th in adult (18+ yrs.) for male having values 24.70 and ranks as 6th highest country among 24 countries for % of female adult IPA having value 43.89.

The data of Prevalence of Insufficient Physical Activity among school going adolescent (11-17yrs) (%) in the year 2010 and 2016, its reduction % between 2010 & 2016 (Table No-4.1.1.1-4.1.1.2) and the interpreted data from WHO on Average annual rate of reduction of Insufficient Physical Activity among school going adolescent (11-17yrs) (%) from 2010 to 2016) (Table No.-4.1.1.4) reveals that thirteen(13) countries have very little improvement in reduction of physical inactivity and others have negative reduction%. Between 2010 and 2016, highest reduction rate is observed in Thailand, only 2.197 % for both sex, 4.385% for male and female 0.164% for female, with highest AARR 0.370%, 0.744% and 0.027% for both sex, male and female respectively (Table-4.1.1.4 and figure 4.1.1.2).

Adolescent are more vulnerable than the adult in respect of prevalence of Insufficient physical activity. Average prevalence of insufficient physical activity for school going adolescent female is higher than that of male among all the selected countries, during 2010 to 2016. Same tendency is found in case of adult (%) of IPA for the year 2016 except two countries , China and Indonesia where values of female IPA are less than that of male (Table 4.1.1.5, Table 4.1.1.4). In case of Average

annual rate of reduction(AARR) in IPA among school going (11-17 yrs.) adolescent 2010 to 2016 it is noticed that AARR in female is very low (<0.17%) for 06 countries and for other no improvement occurs, increasing tendencies are noticed (Table 4.1.1.4).

Figure 4.1.1.4

Prevalence of IPA Among School Going Adolescent (11-17yrs) (%) in India in the Year 2010

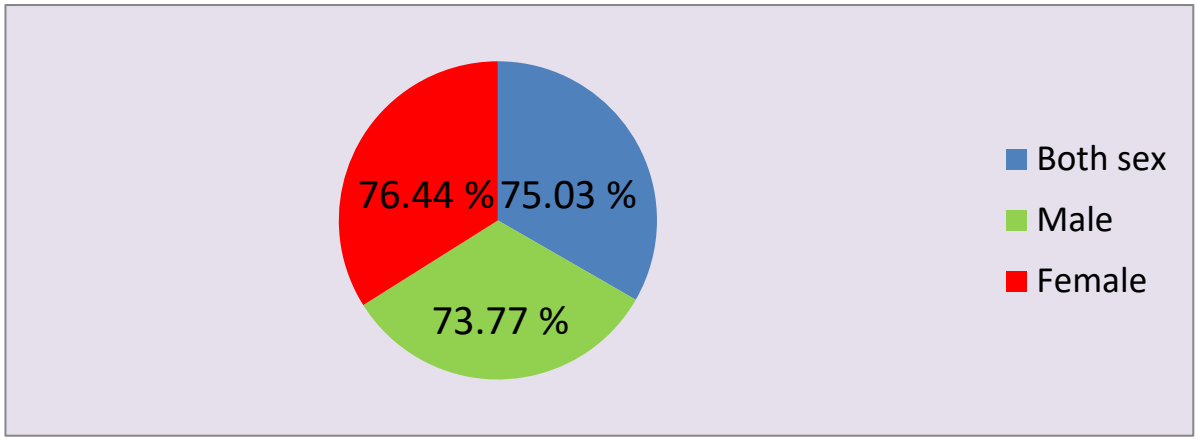
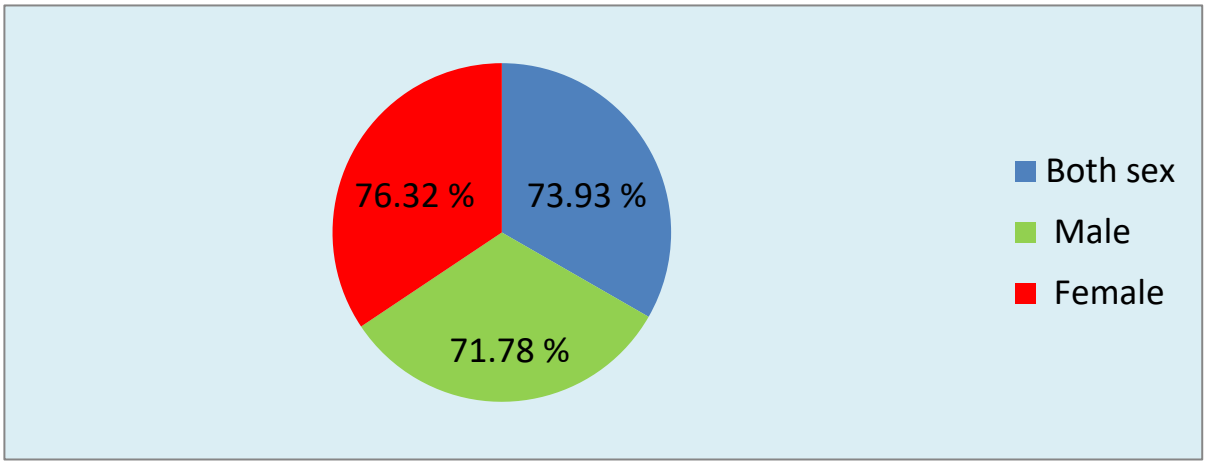


Figure 4.1.1.5

Prevalence of IPA Among School Going Adolescent (11-17yrs) (%) in India in The Year 2016



Among the selected 24 countries, India ranks as the 2nd lowest countries to have the percentages of prevalence of IPA among school going adolescent 11-17 for both sex in the year 2010 and also in 2016, 75.03 and 73.93 respectively and stands just behind the USA. In case of Male, India possesses the 5th lowest values in both the year 2010 and 2016 among selected countries having values 73.77

and 71.78 respectively. India had the Lowest percentage of IPA of Female adolescent (11-17yrs) among all the selected countries in both the year 2010 and 2016 having values 76.44 and 76.32 respectively.

Figure 4.1.1.6

Prevalence of IPA Among Adult 18+ Yrs. (%) In India, Year 2016

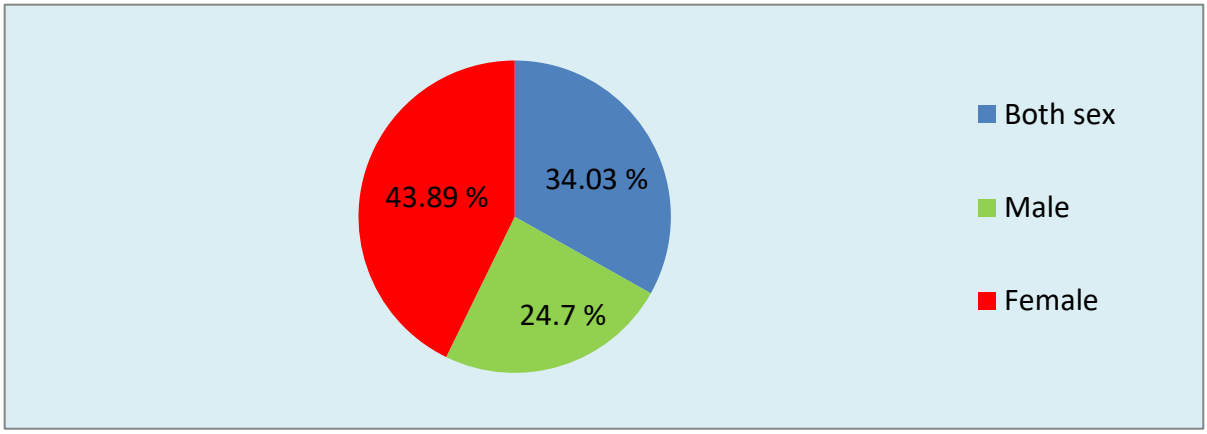
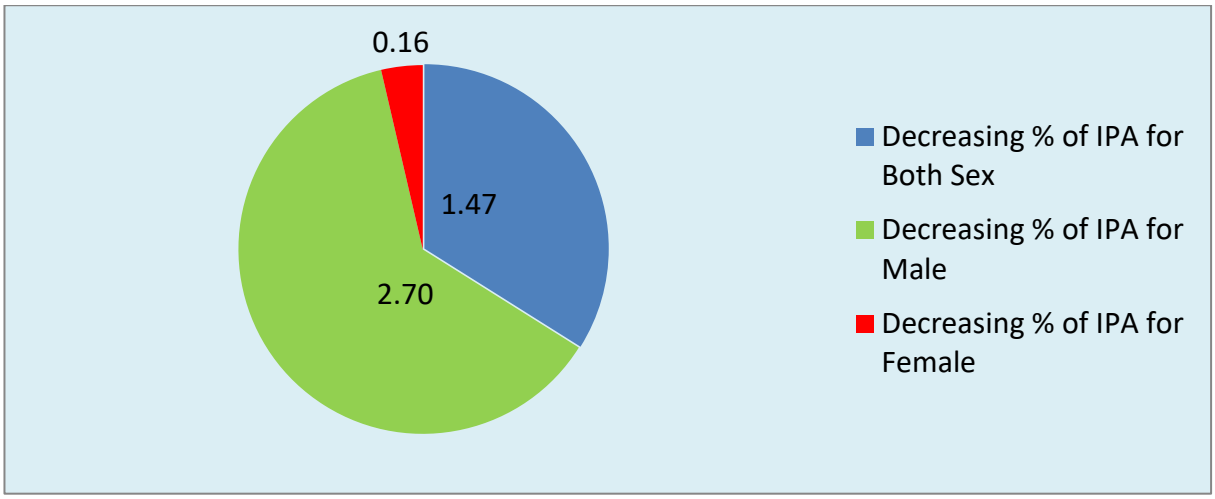


Figure 4.1.1.7

Reduction rate of IPA Among School Going Adolescent (11-17 Yrs.) in India Between 2010 and 2016



India ranks 3rd highest country in reduction rate of IPA among school going adolescent (11-17yrs) for both sex and for male (1.47 % and 2.70% respectively) and for female ranks as 2nd highest country between the year 2010 and 2016 (value 0.16 approx.) among the 24 selected countries having highest GDP in 2021 (Table No.4.1.1.1-4.1.1.4). India ranks as 10th highest country among the 24 countries to have values (34.03) for both sex in % of IPA in 18 + yrs. old in the year 2016 and ranks as

6th highest country in Female adult IPA having value 43.89%. In male -adult -IPA percentage, India ranks as 15th highest country having value 24.7 (Table No. 4.1.1.5 and figure 4.1.1.3).

For India reduction rate of IPA (11-17yrs) between 2010 and 2016 for both sex, for male and for female are **1.466, 2.698 and 0.157** respectively having average annual rate of reduction in Insufficient Physical Activity among school going adolescent (11-17yrs) (%), (2010 to 2016) for both sex, for male and female 0.246, 0.455 and 0.026. (Table 4.1.1.2, and 4.1.1.4). Female are more vulnerable than male in insufficient Physical Inactivity in India in case of both school going adolescent and adult.

Table No 4.1.1.6

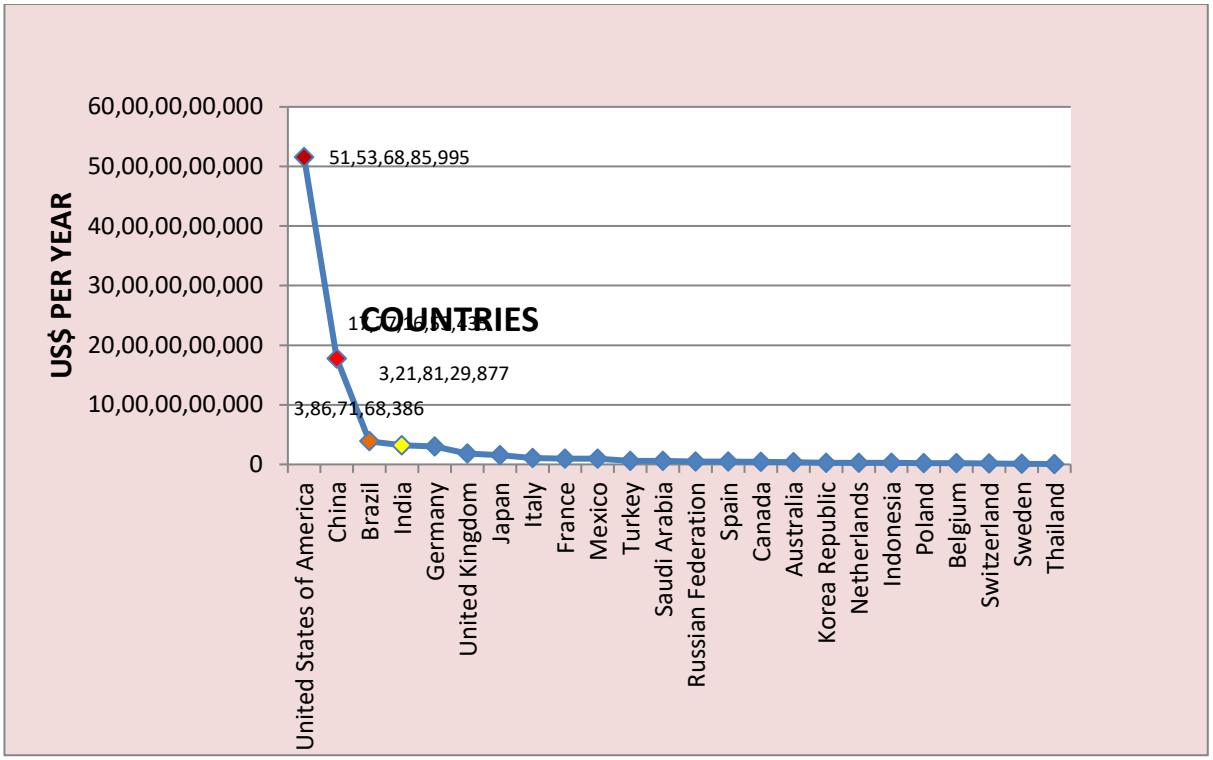
Direct Health Care Costs Attributable to NCDs and Mental Health Associated with Physical Inactivity (Highest to Lowest Value)

SL No.	Countries	Direct Health Care Cost per year in US$
1	United States of America	51,53,68,85,995
2	China	17,77,16,53,435
3	Brazil	3,86,71,68,386
4	India	3,21,81,29,877
5	Germany	3,00,57,98,479
6	United Kingdom	1,82,68,84,193
7	Japan	1,55,15,42,637
8	Italy	1,06,08,03,773
9	France	98,17,44,776
10	Mexico	97,83,38,127
11	Turkey	57,01,97,797
12	Saudi Arabia	56,03,79,179
13	Russian Federation	47,25,57,863
14	Spain	47,00,46,764
15	Canada	42,08,73,550
16	Australia	36,59,59,510
17	Korea Republic	28,08,36,502
18	Netherlands	27,64,15,027
19	Indonesia	27,14,70,954
20	Poland	21,60,60,192
21	Belgium	18,73,67,814
22	Switzerland	15,47,59,836
23	Sweden	11,60,57,841
24	Thailand	6,62,39,212

Source: Global status report on physical activity 2022: country profiles. Geneva: World Health Organization; 2022.p. 90 Licence: CC BY-NC-SA 3.0 IGO.

Figure 4.1.1.8

Direct Health Care Costs Attributable to NCDs and Mental Health Associated With Physical Inactivity In US$ Per Year



As per data interpreted from global Status Report on Physical Activity 2022 (Table 4.1.1.6), it is observed that in all the selected countries there are considerable amounts of direct health care cost which is attributable to NCDS and mental health connected with physical activity. The highest value in direct health care cost per year attributable to Non-communicable diseases and mental health associated with physical inactivity goes for USA, amounting approx. 5154 crores US$. China and Brazil stand for 2nd and 3rd highest countries in direct health care cost per having values approx. 1777 crores US$ and 387 crores US$ respectively. India ranks as 4th highest country having values approx. 322 crores US$ per year.

To achieve the global target for 15% reduction of insufficient physical activity by 2030 all the selected countries along with India have taken different policies, strategies, action plan and others allied measures which are reflected by the table No. 4.1.1.7 to table No.4.1.1.14:

Table: 4.1.1.7
Existence of policy to reduce Implementation of Physical

Existence of operation Policy/Strategy/Action Plan to Reduce Physical inactivity. (Yes/No)						
SL No.	COUNTRIES	YEAR				
		2013	2015	2017	2019	2021
1	United States	Yes	Yes	Yes	Yes	Yes
2	China	Yes	Yes	Yes	Yes	Yes
3	Japan	Yes	Yes	Yes	Yes	Yes
4	Germany	Yes	Yes	Yes	Yes	Yes
5	United Kingdom	Yes	Yes	Yes	Yes	Yes
6	India	Yes	Yes	Yes	Yes	Yes
7	France	Yes	Yes	Yes	Yes	Yes
8	Italy	Yes	Yes	Yes	Yes	Yes
9	Canada	Yes	Yes	Yes	Yes	Yes
10	Korea Republic	Yes	Yes	Yes	Yes	Yes
11	Russian Federation	Yes	Yes	Yes	Yes	Yes
12	Brazil	Yes	Yes	Yes	Yes	Yes
13	Australia	Yes	Yes	Yes	Yes	Yes
14	Spain	Yes	Yes	Yes	Yes	Yes
15	Mexico	Yes	Yes	Yes	Yes	No
16	Indonesia	Yes	Yes	Yes	Yes	No
17	Netherlands	No	Yes	Yes	Yes	Yes
18	Saudi Arabia	Yes	Yes	Yes	Yes	Yes
19	Turkey	Yes	Yes	Yes	Yes	Yes
20	Switzerland	Yes	Yes	Yes	Yes	Yes
21	Poland	Yes	Yes	Yes	Yes	Yes
22	Sweden	Yes	Yes	No	No	Yes
23	Belgium	Yes	Yes	Yes	Yes	Yes
24	Thailand	Yes	No	Yes	Yes	Yes
WHO website, Global Health Observatory, Last updated 25.04.2022,						

Table: 4.1.1.8
Physical inactivity Activity public Awareness Programmes

Implementation of Physical Activity Public Awareness Programme (Yes/No)					
SL No.	COUNTRIES	YEAR			
		2015	2017	2019	2021
1	United States	Yes	Yes	Yes	Yes
2	China	Yes	No	Yes	Yes
3	Japan	Yes	Yes	-	No
4	Germany	Yes	Yes	Yes	Yes
5	United Kingdom	Yes	Yes	Yes	Yes
6	India	Yes	Yes	Yes	Yes
7	France	Yes	Yes	Yes	Yes
8	Italy	Yes	Yes	Yes	Yes
9	Canada	Yes	Yes	Yes	Yes
10	Korea Republic	Yes	Yes	Yes	-
11	Russian Federation	No	Yes	Yes	Yes
12	Brazil	Yes	Yes	Yes	Yes
13	Australia	Yes	Yes	Yes	No
14	Spain	Yes	Yes	Yes	Yes
15	Mexico	No	Yes	Yes	No
16	Indonesia	Yes	Yes	Yes	No
17	Netherlands	Yes	Yes	Yes	Yes
18	Saudi Arabia	Yes	Yes	Yes	Yes
19	Turkey	Yes	Yes	Yes	Yes
20	Switzerland	Yes	Yes	Yes	Yes
21	Poland	Yes	NO	Yes	Yes
22	Sweden	Yes	No	Yes	Yes
23	Belgium	Yes	Yes	Yes	Yes
24	Thailand	Yes	Yes	Yes	Yes
WHO website, Global Health Observatory, Last updated 25. 04. 2022, (-) denotes data not available.					

Table 4.1.1.9
Existence of Tax incentives
Existence of Policy Promoting physical activity

Existence of tax incentives to promote physical activity 2021 (Yes/No)		
SL No.	COUNTRIES	YEAR 2021
1	United States	NO
2	China	NO
3	Japan	NO
4	Germany	YES
5	United Kingdom	YES
6	India	NO
7	France	NO
8	Italy	YES
9	Canada	YES
10	Korea Republic	NO
11	Russian Federation	NO
12	Brazil	YES
13	Australia	NO
14	Spain	NO
15	Mexico	YES
16	Indonesia	NO
17	Netherlands	NO
18	Saudi Arabia	NO
19	Turkey	NO
20	Switzerland	NO
21	Poland	NO
22	Sweden	NO
23	Belgium	NO
24	Thailand	NO
WHO Global Health Observatory, Last updated 25.04.2022		

Table 4.1.1.10
to promote physical activity 2021
Workplace initiatives, 2021

Existence of Policy promoting physical activity: Workplace initiatives, 2021 (Yes/No)		
SL No.	COUNTRIES	YEAR 2021
1	United States	NO
2	China	YES
3	Japan	-
4	Germany	YES
5	United Kingdom	NO
6	India	YES
7	France	YES
8	Italy	YES
9	Canada	-
10	Korea Republic	-
11	Russian Federation	YES
12	Brazil	YES
13	Australia	NO
14	Spain	YES
15	Mexico	YES
16	Indonesia	YES
17	Netherlands	YES
18	Saudi Arabia	YES
19	Turkey	YES
20	Switzerland	NO
21	Poland	YES
22	Sweden	YES
23	Belgium	NO
24	Thailand	YES
WHO Global Health Observatory, Last updated 25.04.2022, (-) denotes data not available.		

Table 4.1.1.11

Existence of policy Promoting physical activity: childcare settings,2021

Existence of Policy promoting physical activity: Childcare settings, 2021 (Yes/No)		
SL No.	COUNTRIES	YEAR 2021
1	United States	NO
2	China	YES
3	Japan	NO
4	Germany	YES
5	United Kingdom	NO
6	India	YES
7	France	YES
8	Italy	YES
9	Canada	-
10	Korea Republic	NO
11	Russian Federation	YES
12	Brazil	NO
13	Australia	NO
14	Spain	YES
15	Mexico	YES
16	Indonesia	NO
17	Netherlands	NO
18	Saudi Arabia	YES
19	Turkey	YES
20	Switzerland	NO
21	Poland	YES
22	Sweden	-
23	Belgium	YES
24	Thailand	YES
WHO Global Health Observatory, Last updated 25.04.2022,(-) denotes data not available.		

Table 4.1.1.12

Existence of Policy promoting Physical activity: active ageing, 2021

Existence of Policy promoting physical activity: active ageing, 2021 (Yes/No)		
SL No.	COUNTRIES	YEAR 2021
1	United States	NO
2	China	YES
3	Japan	YES
4	Germany	YES
5	United Kingdom	YES
6	India	YES
7	France	YES
8	Italy	YES
9	Canada	YES
10	Korea Republic	-
11	Russian Federation	YES
12	Brazil	YES
13	Australia	NO
14	Spain	YES
15	Mexico	YES
16	Indonesia	NO
17	Netherlands	YES
18	Saudi Arabia	YES
19	Turkey	YES
20	Switzerland	YES
21	Poland	YES
22	Sweden	YES
23	Belgium	YES
24	Thailand	YES
WHO Global Health Observatory, Last updated 25.04.2022, (-) denotes data not available.		

Table 4.1.1.13
Existence of National Guidelines for Physical Activity for older adults, 2021

Existence of National guidelines for physical activity for older adults, 2021 (Yes/No)		
SL No.	COUNTRIES	YEAR 2021
1	United States	YES
2	China	YES
3	Japan	YES
4	Germany	YES
5	United Kingdom	YES
6	India	YES
7	France	YES
8	Italy	YES
9	Canada	YES
10	Korea Republic	YES
11	Russian Federation	YES
12	Brazil	YES
13	Australia	YES
14	Spain	YES
15	Mexico	YES
16	Indonesia	YES
17	Netherlands	YES
18	Saudi Arabia	YES
19	Turkey	YES
20	Switzerland	YES
21	Poland	YES
22	Sweden	YES
23	Belgium	NA (NO PAG)
24	Thailand	YES
Taken from WHO Global Health Observatory, Last updated 25.04.2022		

Table: 4.1.1.14
Existence of policy promoting P. activity for : Community-based and Sports Initiatives

Existence of Policy promoting physical activity: community-based & sports initiatives, 2021 (Yes/No)		
SL No.	COUNTRIES	YEAR 2021
1	United States	YES
2	China	YES
3	Japan	-
4	Germany	YES
5	United Kingdom	YES
6	India	YES
7	France	YES
8	Italy	YES
9	Canada	YES
10	Korea Republic	-
11	Russian Federation	YES
12	Brazil	YES
13	Australia	NO
14	Spain	YES
15	Mexico	YES
16	Indonesia	YES
17	Netherlands	NO
18	Saudi Arabia	YES
19	Turkey	YES
20	Switzerland	-
21	Poland	YES
22	Sweden	YES
23	Belgium	YES
24	Thailand	YES
WHO Global Health Observatory, Last updated 25.04.2022, (-) denotes data not available.		

The above qualitative data reveals that 2013 to 2021, all countries had existence of operation Policy/Strategy/Action Plan to Reduce Physical inactivity except two countries (Mexico and

Indonesia) in 2021 only (Table 4.1.1.7). Japan, Australia, Mexico and Indonesia didn't Implement the Physical Activity Public Awareness Programme in the year 2021 (Table 4.1.1.8). Out of 24 countries 09 countries do not have policy to promote physical activity in Childcare settings in 2021(Table 4.1.1.11) (data of two countries, Canada & Sweden, are not available). All the countries have national guidelines for older adults except Belgium (Table 4.1.1.13). Community based sports initiatives are taken by most of the countries except two countries Australia and Netherlands (Table 4.1.1.14). United States, United Kingdom, Australia, Switzerland and Belgium do not have the Policy promoting physical activity in Workplace initiatives (Table 4.1.1.10). Out of 24 countries, 18 countries including India do not have provision of tax incentives to promote physical activity **(**Table 4.1.1.9). Provision for of tax incentives are implemented by Germany, United Kingdom, Italy, Canada, Brazil & Mexico only. India has initiated all the strategic policies said above to curb the insufficient physical activity except implementation of tax incentives to promote physical activity as reported by WHO. From 2010 to 2016 only 1.466 % of reduction in Physical inactivity for Both sex among school going adolescent (11-17 yrs.) is achieved by India.

Table 4.1.1.15

Predicted Prevalence of IPA (11-17 Yrs.) Based on Average Annual Reduction Rate (%) By 2030

Countries	IPA in 2016	AARR (%)	Predicted Prevalence of IPA by 2030
United States	72.05	0.334	68.76
China	84.27	0.089	83.23
Germany	83.69	-0.016	83.88
United Kingdom	79.91	0.062	79.21
India	73.93	0.246	71.43
France	87.00	-0.065	87.80
Italy	88.62	-0.142	90.39
Canada	76.26	0.178	74.38
Korea Republic	94.18	-0.101	95.52
Russian Federation	84.53	-0.085	85.54
Brazil	83.59	0.078	82.69
Australia	89.02	-0.145	90.84
Spain	76.61	0.222	74.26
Mexico	83.17	0.064	82.43
Indonesia	86.38	-0.017	86.59
Netherlands	80.17	0.021	79.94
Turkey	81.28	0.082	80.35
Switzerland	85.71	-0.084	86.72
Poland	78.83	0.074	78.02
Sweden	84.67	-0.081	85.63
Belgium	83.49	0.004	83.44
Thailand	77.47	0.370	73.56

It is noticed that no country will achieve the global target i.e. 15% reduction of IPA by 2030 based on existing trends of avg. annual reduction.

Table 4.1.1.16

Correlation between Avg. Health Expenditure (%) Of GDP And Avg. Prevalence Of IPA (11-17 Yrs.) from 2010-2016

Value of	Both Sex	Male	Female
r	-0.163	-0.242	0.0378
N	22	22	22
df	20	20	20
T Statistic	0.74	1.12	0.169
p value	0.468	0.276	0.867
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.			

Table 4.1.1.17

Correlation between Avg. GGHE-D and Avg. Prevalence of IPA (11-17 Yrs.) from 2010-2016

Value of	Both Sex	Male	Female
r	0.0563	-0.041	0.186
N	22	22	22
df	20	20	20
T Statistic	0.252	0.183	0.846
p value	0.803	0.857	0.408
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.			

Table 4.1.1.18

Correlation between avg. OOPE And Avg. Prevalence Of IPA (11-17 Yrs.) from 2010-2016

Value of	Both Sex	Male	Female
r	0.075	0.212	-0.122
N	22	22	22
df	20	20	20
T Statistic	0.336	0.97	-0.549
p value	0.741	0.343	0.589
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.			

Table 4.1.1.19

Correlation between Health Exp. and Prevalence of IPA (Adult) in 2016

Value of	Both Sex	Male	Female
r	0.276	0.295	0.227
N	24	24	24
df	22	22	22
T Statistic	1.348	1.447	1.093
p value	0.191	0.162	0.286

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Table 4.1.1.20

Correlation between GGHE-D and Prevalence of IPA (Adult) in 2016

Value of	Both Sex	Male	Female
r	0.107	0.175	0.052
N	24	24	24
df	22	22	22
T Statistic	0.504	0.835	0.245
p value	0.619	0.413	0.809

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Table 4.1.1.21

Correlation between OOPE and Prevalence of IPA (Adult) in 2016

Value of	Both Sex	Male	Female
r	-0.261	-0.315	-0.204
N	24	24	24
df	22	22	22
T Statistic	1.267	1.556	0.976
p value	0.218	0.134	0.340

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

No direct significant correlations are observed between CHE and prevalence of IPA(11-17 yrs.), between GGHE-D and prevalence of IPA(11-17yrs.) and between OOPE and Prevalence of IPA(11-17 yrs.). No significant correlation are detected among IPA(18+ Yrs.), CHE, GGHE-D and OOPE.

4.1.2 Non-Communicable Diseases:

Table 4.1.2.1

Total NCD Death (In Thousands) in the Year 2010

Total number of NCD death in the Year 2010 (Highest to Lowest values)								
SL NO.	**COUNTRIES**	**Both sex 2010**		**COUNTRIES**	**Male 2010**		**COUNTRIES**	**Female 2010**
1	**China**	7902041		**China**	4630765		**China**	3271276
2	**India**	4828004		**India**	2782104		**India**	2045900
3	**United States**	2176600		**United States**	1060715		**United States**	1115885
4	**Russian Federation**	1766753		**Russian Federation**	855016		**Russian Federation**	911737
5	**Indonesia**	1077480		**Indonesia**	549935		**Indonesia**	527545
6	**Japan**	960945		**Japan**	503460		**Japan**	457486
7	**Brazil**	836909		**Brazil**	446450		**Germany**	406315
8	**Germany**	765784		**Germany**	359469		**Brazil**	390459
9	**Italy**	530483		**Italy**	256885		**Italy**	273597
10	**United Kingdom**	507702		**United Kingdom**	246819		**United Kingdom**	260884
11	**France**	470442		**France**	238391		**France**	232051
12	**Mexico**	447246		**Mexico**	233164		**Mexico**	214082
13	**Spain**	355620		**Spain**	182373		**Spain**	173247
14	**Poland**	337187		**Poland**	172499		**Poland**	164688
15	**Turkey**	303668		**Turkey**	155628		**Turkey**	148040
16	**Thailand**	288745		**Thailand**	150254		**Thailand**	138492
17	**Canada**	213043		**Korea Republic**	110758		**Canada**	107418
18	**Korea Republic**	204594		**Canada**	105625		**Korea Republic**	93836
19	**Australia**	128272		**Australia**	64942		**Australia**	63330
20	**Netherlands**	121031		**Netherlands**	58588		**Netherlands**	62443
21	**Belgium**	93556		**Saudi Arabia**	49345		**Belgium**	47183
22	**Saudi Arabia**	84825		**Belgium**	46373		**Sweden**	42806
23	**Sweden**	82179		**Sweden**	39373		**Saudi Arabia**	35480
24	**Switzerland**	56238		**Switzerland**	27011		**Switzerland**	29227
Data interpreted from data of WHO Global Health observatory (Last updated 09/02/2021)								

Table 4.1.2.2

Total NCD Death (in Thousands) in the Year 2019 (Highest To Lowest Values)

Total number of NCD death in the Year 2019 (Highest to Lowest values)								
SL. No.	Countries	**Both Sex 2019**		Countries	**Male 2019**		Countries	**Female 2019**
1	**China**	9057956		**China**	5293930		**China**	3764027
2	**India**	6046960		**India**	3339492		**India**	2707468
3	**United States**	2599584		**United States**	1300953		**United States**	1298631
4	**Russian Federation**	1598127		**Russian Federation**	746206		**Russian Federation**	851922
5	**Indonesia**	1386263		**Indonesia**	727210		**Indonesia**	659052
6	**Japan**	1146102		**Japan**	584955		**Japan**	561147
7	**Brazil**	1025708		**Brazil**	538603		**Brazil**	487105
8	**Germany**	765894		**Germany**	427337		**Germany**	338556
9	**Italy**	590485		**Mexico**	299480		**Italy**	307985
10	**Mexico**	572445		**Italy**	282500		**United Kingdom**	273005
11	**United Kingdom**	541739		**United Kingdom**	268734		**Mexico**	272965
12	**France**	521697		**France**	257922		**France**	263775
13	**Turkey**	389121		**Thailand**	199614		**Turkey**	194671
14	**Spain**	387348		**Spain**	194834		**Spain**	192514
15	**Thailand**	380402		**Turkey**	194450		**Thailand**	180789
16	**Poland**	360394		**Poland**	180723		**Poland**	179671
17	**Canada**	249830		**Canada**	126349		**Canada**	123481
18	**Korea Republic**	230032		**Korea Republic**	122639		**Korea Republic**	107393
19	**Australia**	146625		**Australia**	75661		**Australia**	70964
20	**Netherlands**	135055		**Netherlands**	66200		**Netherlands**	68855
21	**Saudi Arabia**	105213		**Saudi Arabia**	64039		**Belgium**	49851
22	**Belgium**	97376		**Belgium**	47524		**Sweden**	42108
23	**Sweden**	82122		**Sweden**	40013		**Saudi Arabia**	41174
24	**Switzerland**	61858		**Switzerland**	29787		**Switzerland**	32071
Data interpreted from data of WHO Global Health observatory (Last updated 09/02/2021)								

It is noticed that between the year 2010 and year 2019 the highest percentage of growth in total number of NCDs death occurs in Thailand for both sex and for male (Both sex: 31.74% and Male: 32.85%) but for female category India scores as the highest country (Female: 32.34 %) among all the selected countries (Table-4.1.2.3). Indonesia ranks as the 2nd highest countries in case of increasing (%) of NCDs death between the year 2010 and the year 2019 for Both Sex and for male (Both sex:

28.66 %, Male: 32.24%) but for female category (31.50 %) Turkey possesses as the 2nd highest scoring country among the all selected countries (Table No. 4.1.2.3).

Table 4.1.2.3

Percentage of Growth of Total NCD Deaths Between the Year 2010 and 2019 (Highest to Lowest Value) (%)

Percentage of Growth in Total NCD Deaths Between the Year 2010 & 2019 (Highest to lowest value) (%)								
SL No.	**Countries**	**Both Sex**		**Countries**	Male		**Countries**	Female
1	**Thailand**	31.74		**Thailand**	32.85		**India**	32.34
2	**Indonesia**	28.66		**Indonesia**	32.24		**Turkey**	31.50
3	**Turkey**	28.14		**Saudi Arabia**	29.78		**Thailand**	30.54
4	**Mexico**	27.99		**Mexico**	28.44		**Mexico**	27.50
5	**India**	25.25		**Turkey**	24.95		**Indonesia**	24.93
6	**Saudi Arabia**	24.04		**United States**	22.65		**Brazil**	24.75
7	**Brazil**	22.56		**Brazil**	20.64		**Japan**	22.66
8	**United States**	19.43		**India**	20.03		**United States**	16.38
9	**Japan**	19.27		**Canada**	19.62		**Saudi Arabia**	16.05
10	**Canada**	17.27		**Germany**	18.88		**China**	15.06
11	**China**	14.63		**Australia**	16.51		**Canada**	14.95
12	**Australia**	14.31		**Japan**	16.19		**Korea Republic**	14.45
13	**Korea Republic**	12.43		**China**	14.32		**France**	13.67
14	**Netherlands**	11.59		**Netherlands**	12.99		**Italy**	12.57
15	**Italy**	11.31		**Korea Republic**	10.73		**Australia**	12.05
16	**France**	10.90		**Switzerland**	10.28		**Spain**	11.12
17	**Switzerland**	9.99		**Italy**	9.97		**Netherlands**	10.27
18	**Spain**	8.92		**United Kingdom**	8.88		**Switzerland**	9.73
19	**Poland**	6.88		**France**	8.19		**Poland**	9.10
20	**United Kingdom**	6.70		**Spain**	6.83		**Belgium**	5.65
21	**Belgium**	4.08		**Poland**	4.77		**United Kingdom**	4.65
22	**Germany**	0.01		**Belgium**	2.48		**Sweden**	-1.63
23	**Sweden**	-0.07		**Sweden**	1.63		**Russian Federation**	-6.56
24	**Russian Federation**	-9.54		**Russian Federation**	-12.73		**Germany**	-16.68
Data interpreted from data of WHO Global Health observatory (Last updated 09/02/2021)								

Table 4.1.2.4

Annual Average NCD Death from 2010 to 2019 (Highest to Lowest Value)

COUNTRIES	BOTH SEX		COUNTRIES	MALE		COUNTRIES	FEMALE
China	8376953		**China**	4010298		**China**	2769741
India	5443289		**India**	2489658		**India**	1971766
United States	2366526		**United States**	956550		**United States**	970910
Russian Federation	1666612		**Russian Federation**	624599		**Russian Federation**	696423
Indonesia	1227225		**Indonesia**	523083		**Indonesia**	485301
Japan	1057583		**Japan**	441435		**Japan**	420975
Brazil	924960		**Brazil**	398144		**Brazil**	356802
Germany	814874		**Germany**	325645		**Germany**	336615
Italy	567395		**Italy**	219587		**Italy**	239909
United Kingdom	531097		**Mexico**	217721		**United Kingdom**	219095
Mexico	504445		**United Kingdom**	211035		**France**	202304
France	496732		**France**	200694		**Mexico**	197611
Spain	376027		**Spain**	153267		**Spain**	150712
Poland	350519		**Turkey**	144317		**Turkey**	140717
Turkey	346667		**Poland**	142805		**Poland**	140457
Thailand	328009		**Thailand**	142054		**Thailand**	127599
Canada	231673		**Canada**	94834		**Canada**	94084
Korea Republic	218579		**Korea Republic**	94718		**Korea Republic**	82841
Australia	138954		**Australia**	57777		**Australia**	54999
Netherlands	128240		**Netherlands**	50347		**Netherlands**	53658
Saudi Arabia	95516		**Saudi Arabia**	47151		**Belgium**	39239
Belgium	95422		**Belgium**	37538		**Sweden**	34021
Sweden	82066		**Sweden**	31657		**Saudi Arabia**	31200
Switzerland	59354		**Switzerland**	23004		**Switzerland**	25056

Data computed from WHO (Global Health Observatory) website, (Last up dated 09/02/2022)

Reduction in total no. of NCDs deaths between 2010 and 2019 are found in case of Russian Federation and Sweden for all categories) and Germany for female category only (Table No: 4.1.2.3).

China and India also rank as the highest and 2nd highest countries in the total number of average annual NCDs death from 2010 to 2019 (among all the selected countries) having values for Both sex: 8376953, for male: 4010298 and for female : 2769741 in China and for Both sex: 5443289, for male: 2489658 and for female: 1971766 in India respectively. (Table No: 4.1.2.4).

Figure 4.1.2.1

Annual Avg. No. of NCD Deaths From 2010 to 2019 (for Both Sex)

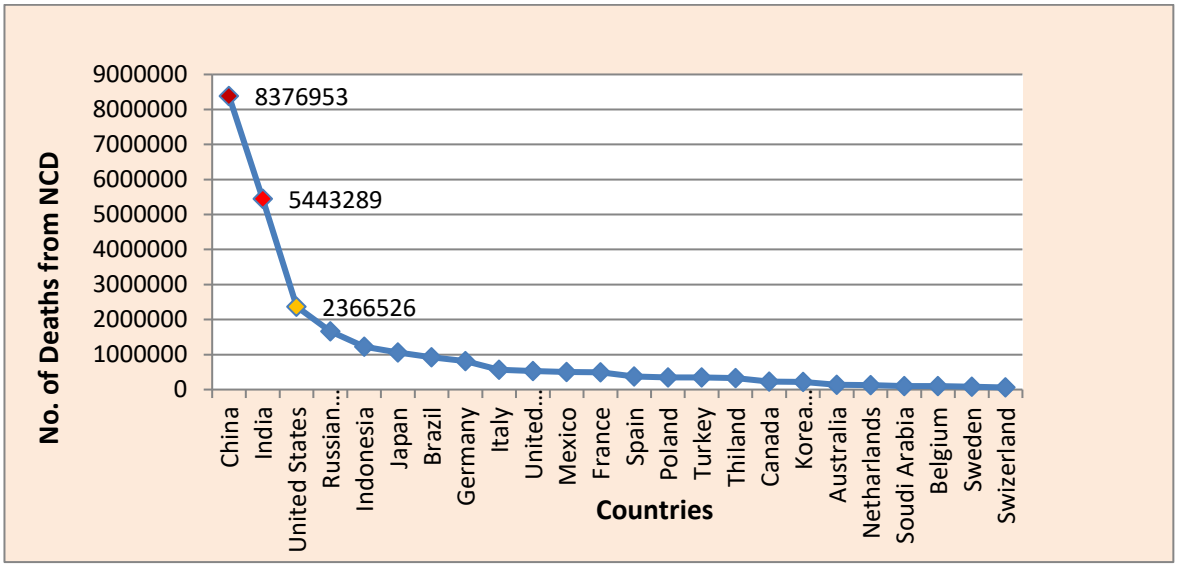


Figure 4.1.2.2

Annual Avg. No. of NCD Deaths From Year 2010 to 2019 for Male

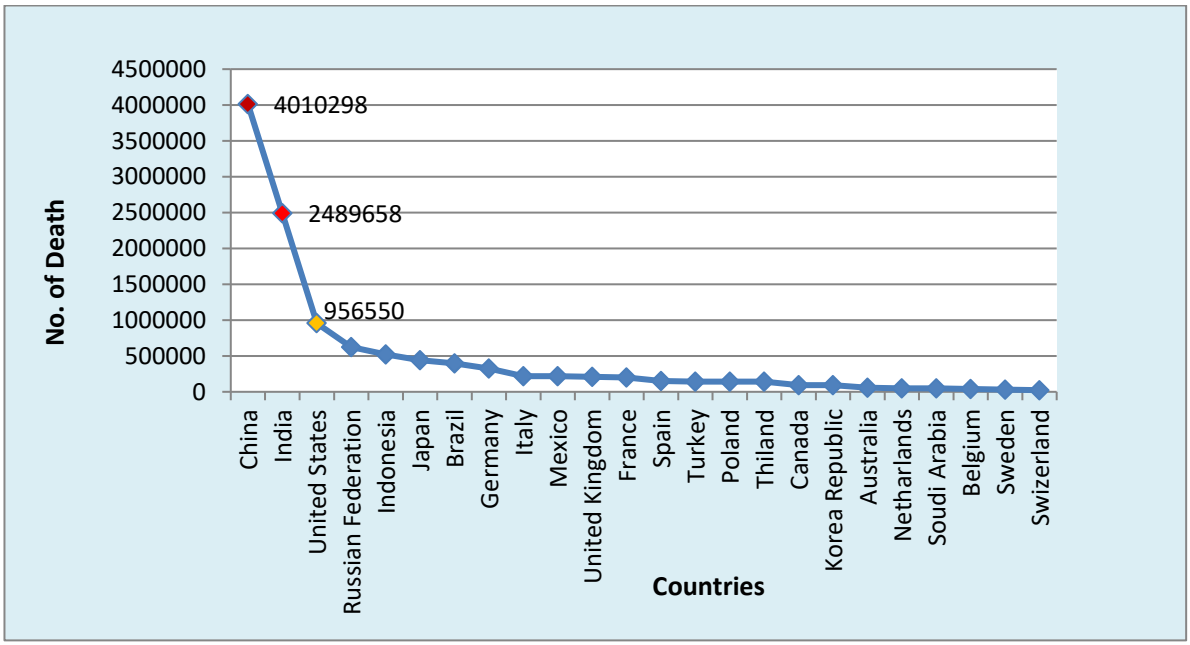


Figure 4.1.2.3

Annual Avg. No. of Deaths from NCD from Year 2010 to 2019 for Female

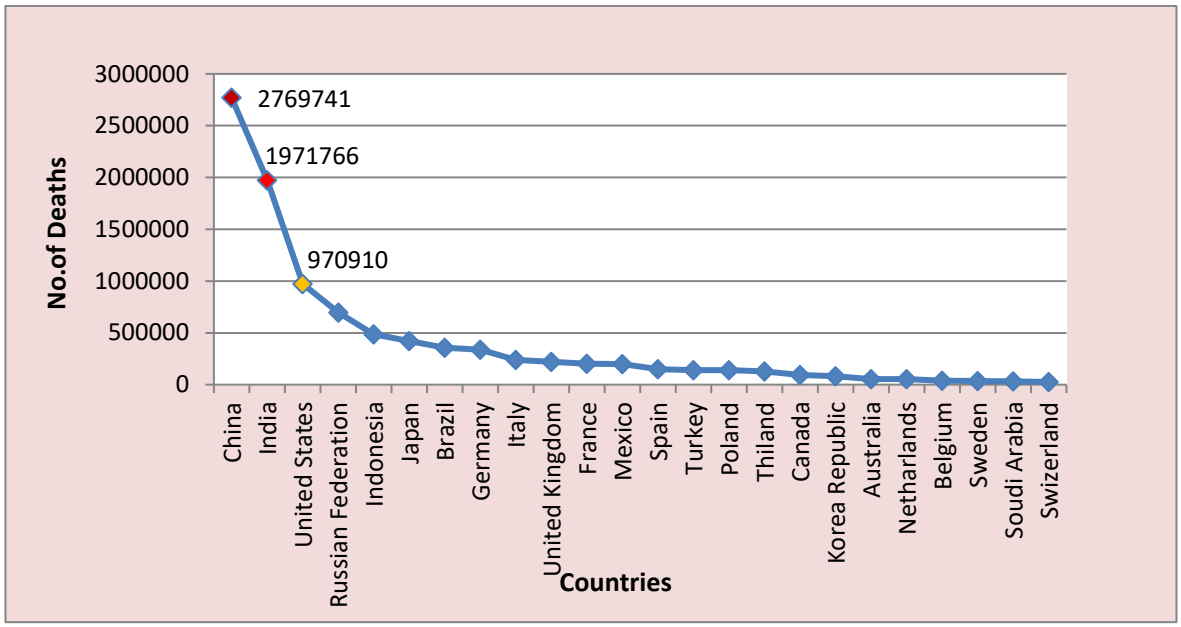


Figure -4.1.2.4

Average Annual Growth Rate in Total NCD Deaths from Year 2010-2019 (%)

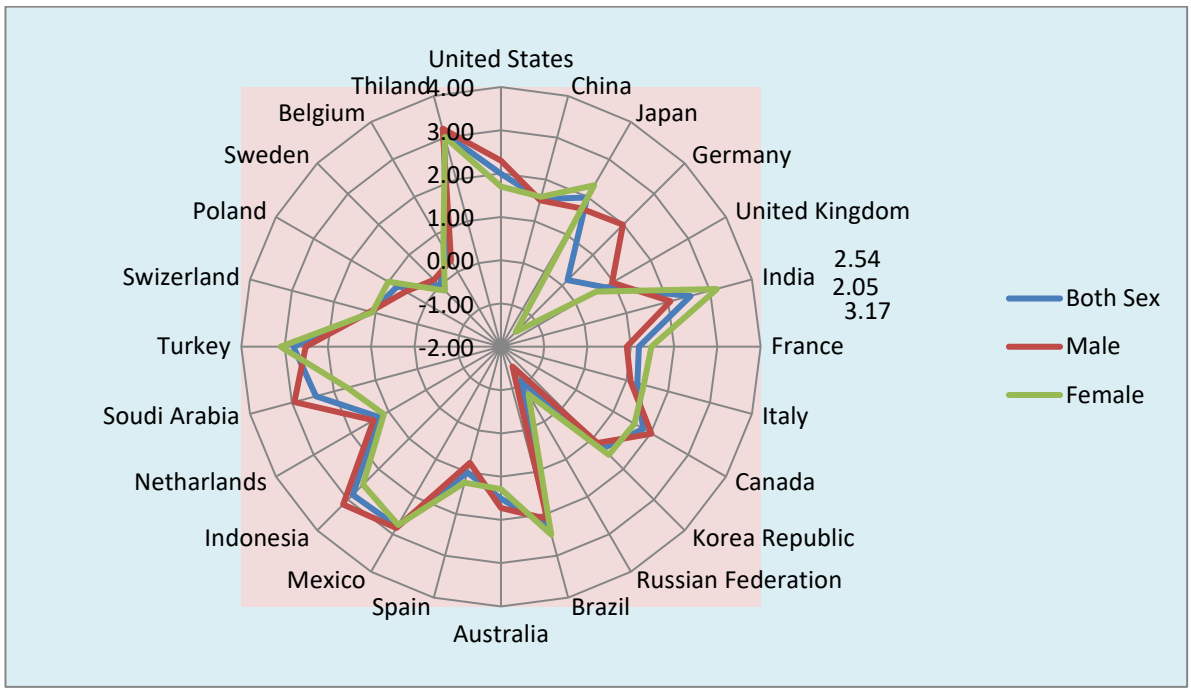


Table 4.1.2.5

Average Annual Growth Rate of Total NCD Death from 2010 to 2019 (Highest to Lowest Value) (%)

AAGR of total NCD Death from 2010 to 2019 (Highest to Lowest value) (%)								
SL No.	**COUNTRIES**	**Both Sex**		**Countries**	**Male**		**Countries**	**Female**
1	**Thailand**	3.116		**Thailand**	3.212		**India**	3.165
2	**Indonesia**	2.840		**Indonesia**	3.154		**Turkey**	3.092
3	**Turkey**	2.796		**Saudi Arabia**	2.942		**Thailand**	3.012
4	**Mexico**	2.795		**Mexico**	2.835		**Mexico**	2.752
5	**India**	2.535		**Turkey**	2.509		**Indonesia**	2.505
6	**Saudi Arabia**	2.424		**United States**	2.296		**Brazil**	2.493
7	**Brazil**	2.293		**Brazil**	2.116		**Japan**	2.307
8	**United States**	1.995		**India**	2.055		**United States**	1.703
9	**Japan**	1.986		**Canada**	2.018		**Saudi Arabia**	1.668
10	**Canada**	1.790		**Germany**	1.984		**China**	1.583
11	**China**	1.534		**Australia**	1.726		**Canada**	1.564
12	**Australia**	1.511		**Japan**	1.689		**Korea Republic**	1.530
13	**Korea Republic**	1.323		**China**	1.502		**France**	1.477
14	**Italy**	1.262		**Netherlands**	1.400		**Italy**	1.416
15	**Netherlands**	1.257		**Korea Republic**	1.147		**Australia**	1.292
16	**France**	1.190		**Switzerland**	1.133		**Spain**	1.255
17	**Switzerland**	1.100		**Italy**	1.103		**Netherlands**	1.123
18	**Spain**	1.009		**United Kingdom**	0.968		**Switzerland**	1.074
19	**Poland**	0.774		**France**	0.906		**Poland**	1.009
20	**United Kingdom**	0.751		**Spain**	0.774		**Belgium**	0.656
21	**Belgium**	0.482		**Poland**	0.547		**United Kingdom**	0.546
22	**Germany**	0.179		**Belgium**	0.306		**Sweden**	-0.169
23	**Sweden**	0.002		**Sweden**	0.187		**Russian Federation**	-0.731
24	**Russian Federation**	-1.085		**Russian Federation**	-1.471		**Germany**	-1.518
Data interpreted from data of WHO Global Health observatory (Last updated 09/02/2021)								

From 2010 to 2019 percentage of average annual growth in total NCD death Thailand ranks as the highest scoring countries among all for both sex and for male (3.116% and 3.212 % respectively), but in case of female category India possesses the highest % of Avg. Annual Growth Rate in total

NCDs death (Female 3.165%). Decreasing trend in total NCDs deaths are noticed only for Russian Federation and Sweden for both sex, for male and also for female categories but decreasing tendency is found in only for female in Germany (Table 4.1.2.5).

Table 4.1.2.6

Latest Status of Non-Communicable Diseases (based on NCD Progress Monitor 2022)

Countries	Total Population	% of Death from NCDs(of Total Death)	Total number of NCD deaths	Probability of premature mortality from NCDs (%)
United States	32,91,00,000	88	26,00,000	14
China	1,43,40,00,000	90	90,58,000	16
Japan	12,69,00,000	85	11,46,000	8
Germany	8,35,17,000	91	7,65,900	12
United Kingdom	6,75,30,000	88	5,41,700	10
India	1,36,60,00,000	66	60,47,000	22
France	6,51,30,000	87	5,21,700	11
Italy	6,05,50,000	91	5,90,500	9
Canada	3,74,11,000	90	2,49,800	10
Korea Republic	5,12,25,000	78	2,30,000	7
Russian Federation	14,59,00,000	89	15,98,000	24
Brazil	21,10,00,000	75	10,26,000	15
Australia	2,52,03,000	89	1,46,600	9
Spain	4,67,37,000	91	3,87,300	10
Mexico	12,76,00,000	80	5,72,400	16
Indonesia	27,06,00,000	76	13,86,000	25
Netherlands	1,70,97,000	88	1,35,100	10
Saudi Arabia	3,42,69,000	73	1,05,200	21
Turkey	8,34,30,000	90	3,89,100	16
Switzerland	85,91,000	90	61,900	8
Poland	3,78,88,000	90	3,60,400	17
Sweden	1,00,36,000	89	82,100	8
Belgium	1,15,39,000	86	97,400	11
Thailand	6,96,26,000	77	3,80,400	14
Ref: Non-communicable diseases progress monitor 2022, WHO 2022, (Data based on 2019)				

(Table 4.1.2.6) reflects that Germany, Italy and Spain bears the highest % of death from NCDs having the values for each 91%. China, Canada, Turkey, Switzerland and Poland come next with values 90 % for each. India has the lowest % of deaths from NCDs among all countries but its percentage of

probability of premature mortality from NCDs is considerably high 22 %, ranks as 3rd highest just after Russian Federation (24%, ranks as the 2nd highest country) and Indonesia (25%, ranks as the highest country in percentage of probability of premature mortality from NCDS).

Table 4.1.2.7

Predicted number of Deaths from NCDs by 2030

Countries	Deaths from NCDs 2019	Avg. Annual Growth Rate(2010-2019)	Predicted Deaths from NCDs by 2030	Rank (Highest to Lowest)
United States	2599584	2.00	3230525	3rd
China	9057956	1.53	10708801	1st
Japan	1146102	1.99	1422855	5th
Germany	765894	0.18	781081	8th
United Kingdom	541739	0.75	588241	12th
India	6046960	2.54	7964244	2nd
France	521697	1.19	594195	11th
Italy	590485	1.26	677852	10th
Canada	249830	1.79	303682	17th
Korea Republic	230032	1.32	265800	18th
Russian Federation	1598127	-1.09	1417359	6th
Brazil	1025708	2.29	1316248	7th
Australia	146625	1.51	172916	19th
Spain	387348	1.01	432572	15th
Mexico	572445	2.80	775247	9th
Indonesia	1386263	2.84	1886426	4th
Netherlands	135055	1.26	154943	20th
Saudi Arabia	105213	2.42	136924	21st
Turkey	389121	2.80	527023	14th
Switzerland	61858	1.10	69765	24th
Poland	360394	0.77	392288	16th
Sweden	82122	0.00	82136	23rd
Belgium	97376	0.48	102663	22nd
Thailand	380402	3.12	533121	13th

Table 4.1.2.7 regarding predicted NCDs death by 2030 indicates that India will be the 2nd highest country among the 24 selected countries just followed by China, the highest one. Switzerland will be country to have minimum number of deaths caused by NCDs by 2030 based on Average Annual Growth Rate from 2010-2019.

Table 4.1.2.8

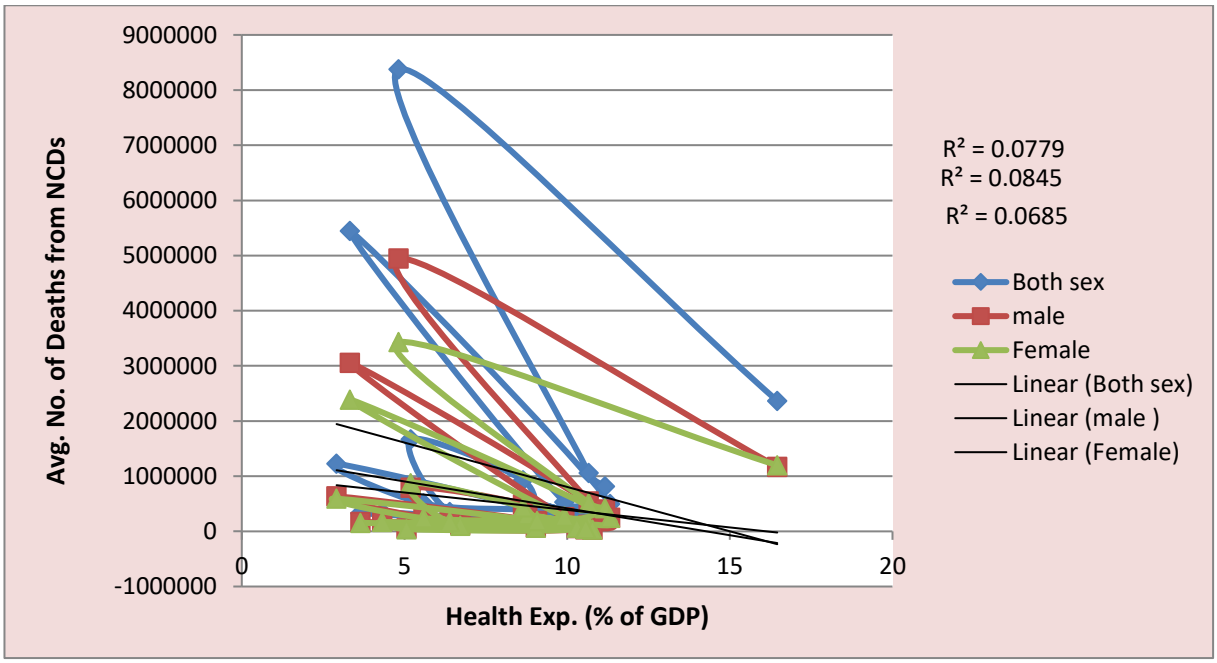
Correlation between Avg. Health Expenditure and Avg. Number of Deaths from NCDs (2010-2019)

Correlation between Avg. Health expenditure (% of GDP) an avg. number of deaths from (NCDs) (2010-2019)			
Value of	Both Sex	Male	Female
r	-0.279	-0.291	-0.262
N	24	24	24
df	22	22	22
T Statistic	1.363	1.425	1.272
p value	0.187	0.168	0.217

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Figure 4.1.2.5

Correlation Between Avg. Health Expenditure (% Of GDP) and Avg. No. of Deaths from NCDS (2010-2019) for Both Sex



Insignificant negative association is observed between average health expenditure and average number of NCD deaths from the year2010 to 2019 (Table 4.1.2.8 and Figure 4.1.2.5) for both sex, male and female category at 0.05 level of significance.

Table 4.1.2.9

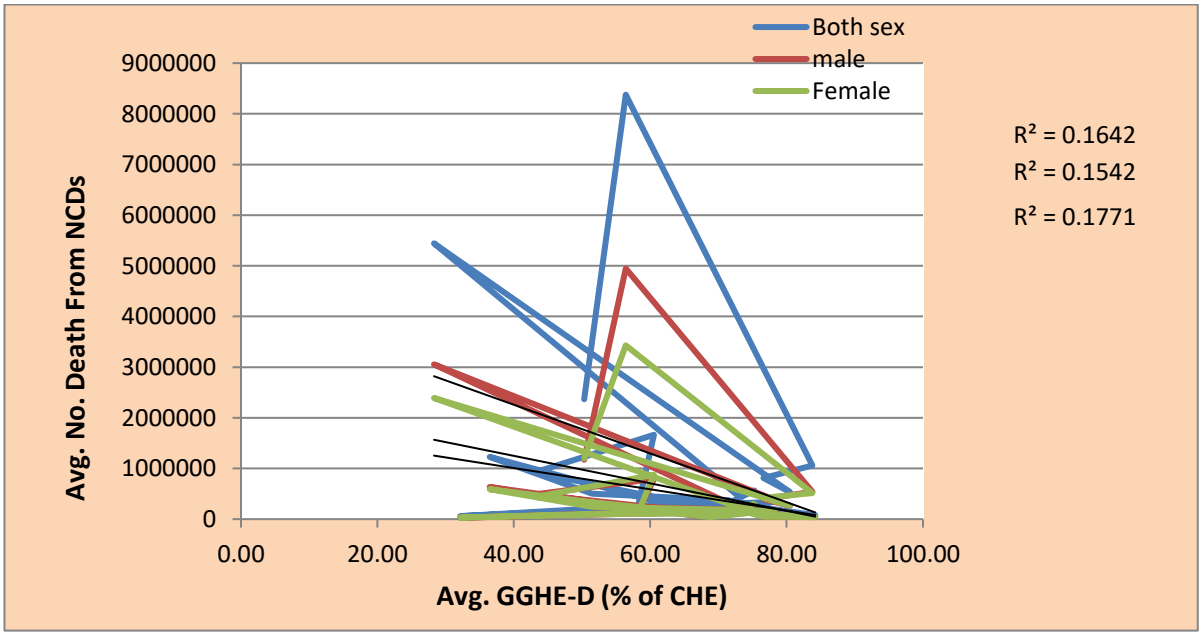
Correlation Between Avg. Domestic General Government Health Expenditure(% Of CHE) and Avg. Number of Death from Non-Communicable Diseases (NCDS) (2010-2019)

Correlation between Avg. Domestic General Government Health expenditure(% of CHE) and avg. number of Death from non-communicable diseases(NCDs) (2010-2019)			
Value	Both Sex	Male	Female
r	-0.405	-0.393	-0.421
N	24	24	24
df	22	22	22
T Statistic	2.079	2.003	-2.176
p value	0.049	0.058	0.0406

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Figure 4.1.2.6

Correlation Between Avg. Domestic General Government Health Exp.(% of CHE) and Avg. No. of Death from NCDs (2010-2019)



Weak negative association is found between avg. Domestic General Government Health Expenditure(% CHE) and average number of NCD deaths from 2010 to 2019 for both sex, male and female category at 0.05 level of significance (Table-4.1.2.9 and Figure 4.1.2.6).

Table: 4.1.2.10

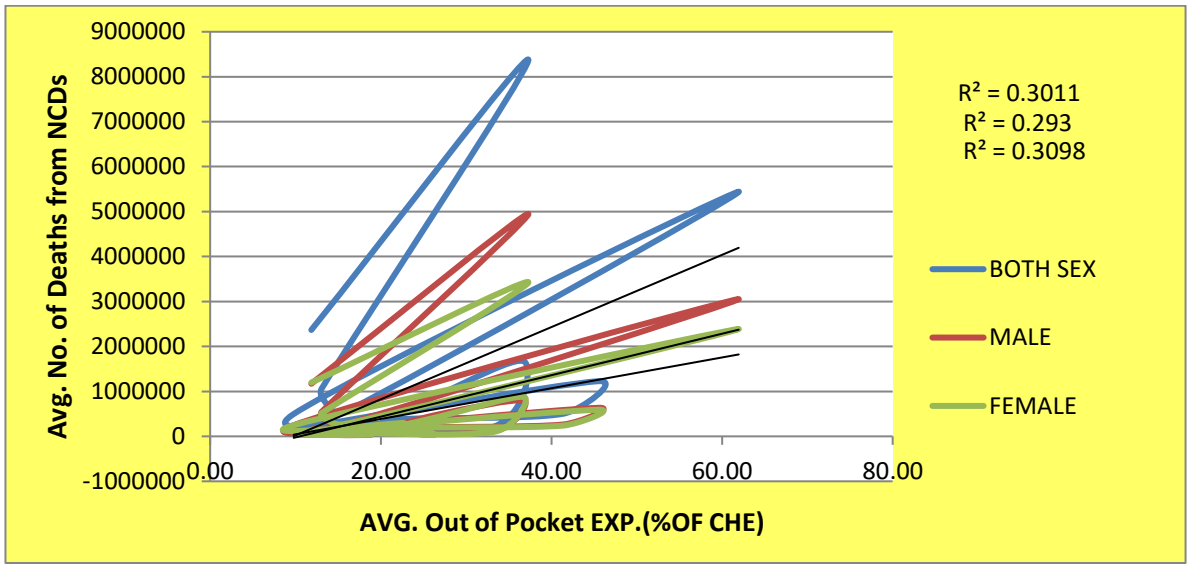
Correlation Between Avg. Out Of Pocket Expenditure (% Of Current Health Expenditure) and Avg. Number Of Deaths From Non-Communicable Disease (2010-2019)

Correlation between Avg. Out of Pocket expenditure (% of current Health expenditure) and avg. number of deaths from non-communicable disease (2010-2019)			
Value	Both Sex	Male	Female
r	0.549	0.541	0.557
N	24	24	24
df	22	22	22
T Statistic	3.078	3.019	3.142
p value	0.0054	0.0063	0.0047

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Figure 4.1.2.7

Correlation Between Avg. Out Of Pocket Exp.(% Of CHE) and Avg. No. of Death from NCDS (2010-2019)



Moderate positive correlation is observed between average Out of Pocket Expenditure(% CHE) and average number of NCD deaths from the year 2010 to 2019 (Table-4.1.2.10 and Figure 4.1.2.7) for both sex, male and female category at 0.05 level of significance.

4.1.3 Children and Adult Mortality Rate:

Table 4.1.3.1

Probability of Dying Under 5 Yrs./1000 Children In 2010 and In 2021

SL No.	COUNTRIES	Probability of dying under 5 yrs. /1000 children (2010)		SL No.	COUNTRIES	Probability of dying under 5 yrs. /1000 children (2021)
1	**India**	58.1		1	**India**	30.62
2	**Indonesia**	33.85		2	**Indonesia**	22.17
3	**Mexico**	19.17		3	**Brazil**	14.41
4	**Brazil**	18.64		4	**Mexico**	13.24
5	**Turkey**	18.11		5	**Turkey**	8.98
6	**China**	15.76		6	**Thailand**	8.29
7	**Thailand**	13.56		7	**China**	6.93
8	**Saudi Arabia**	12.25		8	**Saudi Arabia**	6.72
9	**Russian Federation**	10.42		9	**United States**	6.24
10	**United States**	7.34		10	**Russian Federation**	5.05
11	**Poland**	5.96		11	**Canada**	5.04
12	**Canada**	5.72		12	**France**	4.35
13	**United Kingdom**	5.17		13	**Poland**	4.35
14	**Australia**	4.77		14	**United Kingdom**	4.19
15	**Switzerland**	4.56		15	**Belgium**	4.1
16	**Belgium**	4.46		16	**Netherlands**	4.05
17	**Netherlands**	4.43		17	**Switzerland**	3.83
18	**France**	4.21		18	**Australia**	3.71
19	**Germany**	4.18		19	**Germany**	3.57
20	**Korea Republic**	4.12		20	**Spain**	3.05
21	**Italy**	3.96		21	**Korea Republic**	2.89
22	**Spain**	3.85		22	**Italy**	2.61
23	**Japan**	3.2		23	**Sweden**	2.46
24	**Sweden**	3.06		24	**Japan**	2.3
Data interpreted from WHO Global Health Observatory, last updated 16.02.2023.						

Table 4.1.3.2

Average Mortality Rate Under 5 yrs. (2010-2021)

Sl. No.	Countries	Average Mortality Rate Under Five (Highest to lowest values). Both sex
1	**India**	43.11
2	**Indonesia**	27.48
3	**Brazil**	16.17
4	**Mexico**	16.05
5	**Turkey**	12.92
6	**China**	10.72
7	**Thailand**	10.69
8	**Saudi Arabia**	9.09
9	**Russian Federation**	7.85
10	**United States**	6.76
11	**Canada**	5.37
12	**Poland**	4.94
13	**United Kingdom**	4.55
14	**France**	4.23
15	**Switzerland**	4.22
16	**Belgium**	4.17
17	**Netherlands**	4.13
18	**Australia**	4.01
19	**Germany**	3.89
20	**Korea Republic**	3.48
21	**Italy**	3.40
22	**Spain**	3.36
23	**Sweden**	2.81
24	**Japan**	2.75
Data interpreted from WHO GHO(16.02. 2023)		

In the year 2010 and 2021 India had the highest under five mortality rate having values 58.1 and 30.62. Indonesia ranked as the 2nd highest country in both the year 2010 and 2021 (33.85 and 22.17 respectively) among 24 countries. Sweden ranked as the lowest country in 2010 (3.06) and Japan ranked as the lowest country in the year 2021 (2.3) (Table 4.1.3.1). India and Indonesia also ranked as 1st and 2nd highest country in average annual mortality rate under five years from 2010 to 2021 having values 43.11 and 27.48. Japan shows the lowest value 2.75 (Table 4.1.3.2)(Figure 4.1.3.1).

Table 4.1.3.3

Avg. Annual Rate of Reduction in Mortality Rate Under 5 Yrs. Age 2010-2021

SL No.	COUNTRIES	AARR under 5 yr. Mortality (Highest to lowest values) 2010-2021(%)
1	**China**	7.20
2	**Russian Federation**	6.35
3	**Turkey**	6.18
4	**India**	5.66
5	**Saudi Arabia**	5.31
6	**Thailand**	4.37
7	**Indonesia**	3.77
8	**Italy**	3.70
9	**Mexico**	3.31
10	**Korea Republic**	3.17
11	**Japan**	2.95
12	**Poland**	2.81
13	**Brazil**	2.27
14	**Australia**	2.24
15	**Spain**	2.09
16	**Sweden**	1.96
17	**United Kingdom**	1.89
18	**Switzerland**	1.57
19	**United States**	1.46
20	**Germany**	1.42
21	**Canada**	1.14
22	**Netherlands**	0.81
23	**Belgium**	0.76
24	**France**	-0.30
Data interpreted from WHO GHO(16.02. 2023)		

Table 4.1.3.3 and Figure 4.1.3.2 reflect that in spite of having highest average annual mortality rate India has been trying much to curve down its under-five-mortality rate with an average annual reduction rate 5.6% (Ranked as 4th Highest country) from 2010 to 2021. China ranked as the highest scored country in Average Annual Reduction Rate of under-five-mortality rate from 2010-2021 in spite of having lower average under five mortality rate (10.72) for the same period. Very little growth rate is found in France although average annual mortality rate is 4.23. Russian Federation and Turkey ranked as the 2nd highest and the 3rd highest scoring country having values 6.35 and 6.18.

Figure 4.1.3.1

Average Under 5 Yrs. Mortality Rate from 2010-2021

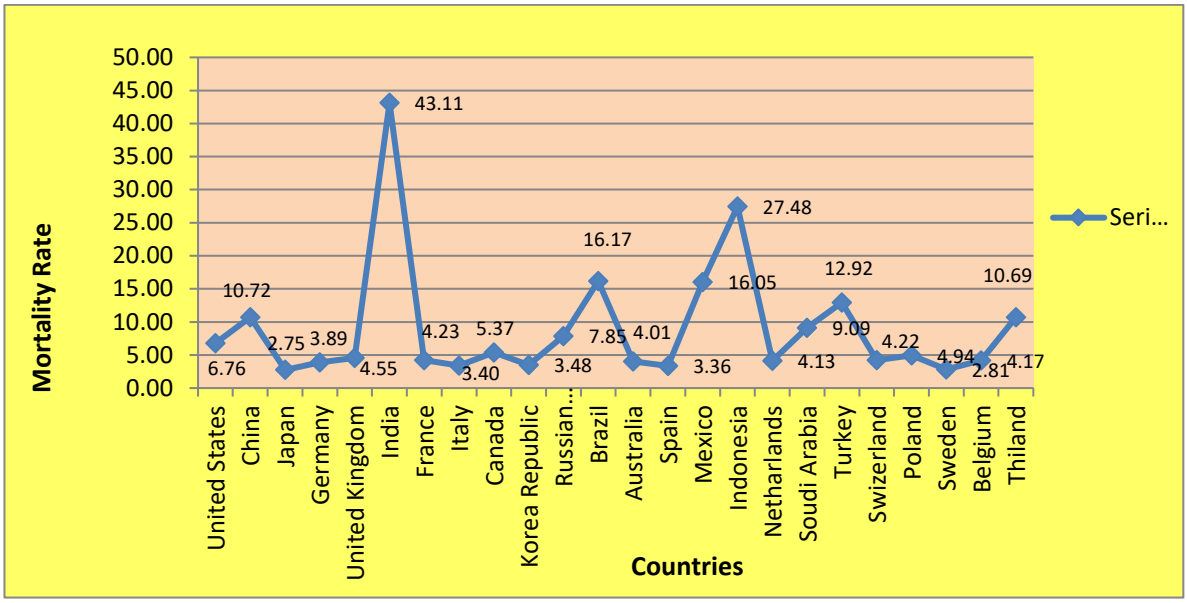


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Figure 4.1.3.2

Average Annual Rate of Reduction in Under Five Mortality from 2010 To 2021 (%)

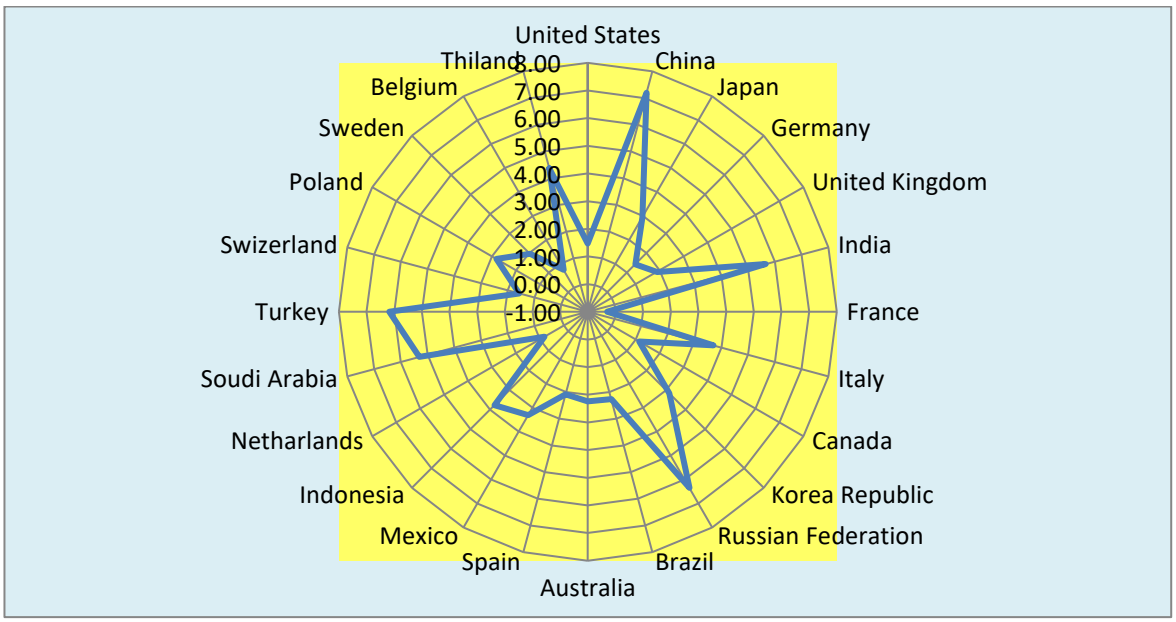


Table 4.1.3.4

Correlation Between Avg. Annual Health Expenditure (% of GDP) and Average Under Five Children Mortality Rate (2010 to 2019)

Correlation between avg. annual health expenditure (% of GDP) & average under five children mortality rate (2010 to 2019)	
r	-0.0607
N	24
df	22
T. Statistic	3.59
p value	0.0016
*r stands for Pearson coefficient Correlation,*N = Number of observation,* df=Degree of Freedom, *T. Statistic= Test Statistic*P value stands for Probability value.	

Figure 4.1.3.3

Correlation Between Avg. Annual Health Expenditure (% of GDP) and Avg. Under Five Children Mortality Rate (2010-2019)

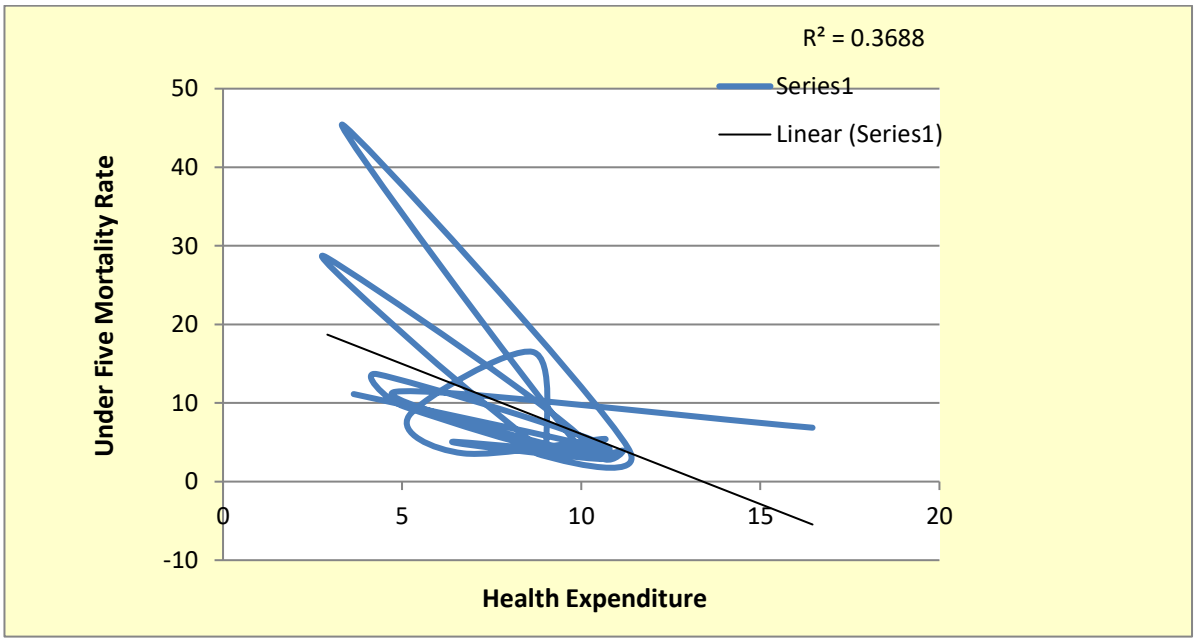


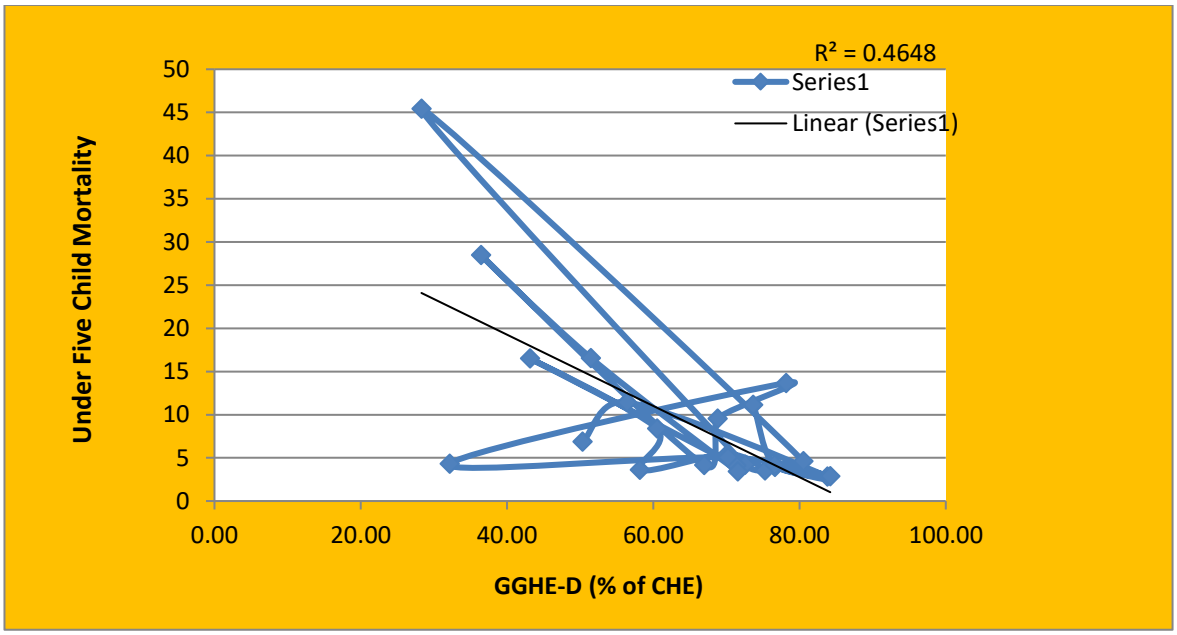
Table 4.1.3.5

Correlation Between Domestic General Government Health Expenditure (% of CHE) and Under Five Child Mortality Rate(2010-2019)

Correlation between avg. GGHE-D and average under five children mortality rate (2010 to 2019)	
r	-0.0682
N	24
df.	22
T. Statistic	4.37
p value	0.0002
*r stands for Pearson coefficient Correlation,*N = Number of observation,* df=Degree of Freedom, *T. Statistic= Test Statistic*P value stands for Probability value.	

Figure 4.1.3.4

Correlation Between Domestic General Government Health Expenditure (% of CHE) and Under Five Child Mortality Rate (2010-2019)



Negative correlation exists between average annual health expenditure (% of GDP) and average annual under five mortality (5-14yrs) from 2010 to 2019 having value r(24)= -0.0607, p= 0.0016 ≤0.05, Df =(N-2)=22,(Table-4.1.3.4 and Figure 4.1.3.3). Negative correlation also exists between average annual Domestic General Government health expenditure (% of GDP) and average annual

under five child mortality from 2010 to 2019 having value r(24)= -0.0682, p= 0.0002≤0.05, Df =(N-2)=22,(Table-4.1.3.5 and Figure -4.1.3.4).

Table No 4.1.3.6

Mortality Rate for Children (5-14yrs.) in the Year 2010 and 2019

SL No.	COUNTRIES	**Mortality Rate for children (5-14 Yrs.) (2010) (Highest to lowest value)**		COUNTRIES	**Mortality Rate for children (5-14 Yrs.) (2019) (Highest to lowest value)**
1	**India**	9.03		**India**	5.49
2	**Indonesia**	6.67		**Indonesia**	5.14
3	**Thailand**	5.02		**Thailand**	4.19
4	**Turkey**	4.11		**Mexico**	2.53
5	**Russian Federation**	3.06		**Brazil**	2.36
6	**Brazil**	2.93		**Russian Federation**	1.94
7	**Mexico**	2.88		**Turkey**	1.93
8	**Saudi Arabia**	2.61		**China**	1.89
9	**China**	2.57		**Saudi Arabia**	1.75
10	**Poland**	1.39		**United States**	1.37
11	**United States**	1.33		**Poland**	1.01
12	**Korea Republic**	1.19		**Canada**	0.9
13	**Canada**	1.06		**Italy**	0.86
14	**Belgium**	1.03		**Germany**	0.8
15	**Spain**	1.02		**Belgium**	0.8
16	**Australia**	0.99		**Australia**	0.79
17	**United Kingdom**	0.97		**Korea Republic**	0.78
18	**Netherlands**	0.95		**United Kingdom**	0.77
19	**Italy**	0.94		**Japan**	0.75
20	**France**	0.91		**France**	0.74
21	**Japan**	0.9		**Spain**	0.71
22	**Germany**	0.9		**Sweden**	0.71
23	**Sweden**	0.9		**Netherlands**	0.7
24	**Switzerland**	0.89		**Switzerland**	0.67
Data interpreted from WHO Global Health observatory, last updated 19.05.2021.					

Table 4.1.3.7
Reduction of Mortality Rate in Children (5-14 Yrs.) Between 2010 and 2019 (%)

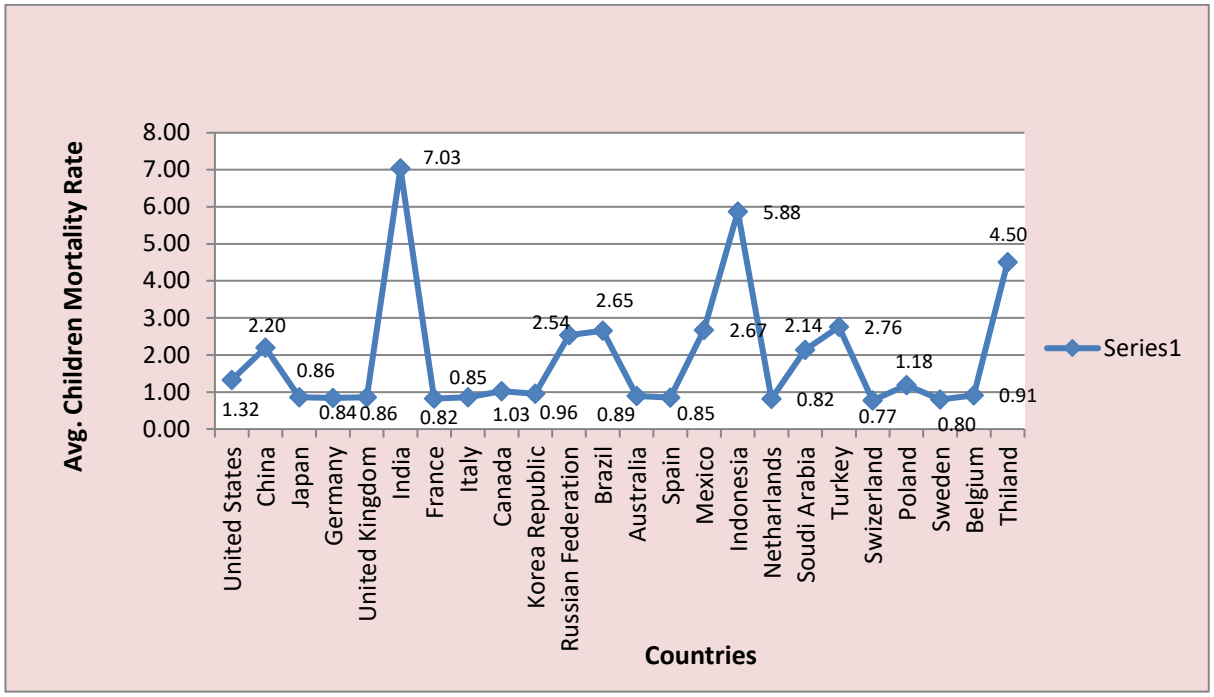
SL No.	Countries	Reduction (%) of mortality rate in Children (5-14 yrs.) between 2010 & 2019 (Highest to Lowest Value)
1	**Turkey**	53.04
2	**India**	39.20
3	**Russian Federation**	36.60
4	**Korea Republic**	34.45
5	**Saudi Arabia**	32.95
6	**Spain**	30.39
7	**Poland**	27.34
8	**China**	26.46
9	**Netherlands**	26.32
10	**Switzerland**	24.72
11	**Indonesia**	22.94
12	**Belgium**	22.33
13	**Sweden**	21.11
14	**United Kingdom**	20.62
15	**Australia**	20.20
16	**Brazil**	19.45
17	**France**	18.68
18	**Japan**	16.67
19	**Thailand**	16.53
20	**Canada**	15.09
21	**Mexico**	12.15
22	**Germany**	11.11
23	**Italy**	8.51
24	**United States**	-3.01
Data interpreted from WHO Global Health observatory Last updated in 19.05.2021		

Table 4.1.3.8
Average Annual Children Mortality Rate (5-14 Yrs.) from (2010-2019)

SL No.	Countries	Avg. annual Children Mortality Rate (5-14 yrs.) from (2010-2019) (Highest to lowest value)
1	**India**	7.034
2	**Indonesia**	5.875
3	**Thailand**	4.504
4	**Turkey**	2.76
5	**Mexico**	2.673
6	**Brazil**	2.653
7	**Russian Federation**	2.537
8	**China**	2.196
9	**Saudi Arabia**	2.136
10	**United States**	1.322
11	**Poland**	1.183
12	**Canada**	1.025
13	**Korea Republic**	0.955
14	**Belgium**	0.913
15	**Australia**	0.894
16	**Japan**	0.861
17	**United Kingdom**	0.859
18	**Italy**	0.854
19	**Spain**	0.853
20	**Germany**	0.837
21	**France**	0.822
22	**Netherlands**	0.816
23	**Sweden**	0.801
24	**Switzerland**	0.771
Data interpreted from WHO Global Health observatory Last updated in 19.05.2021		

Figure 4.1.3.5

Average Annual Children Mortality Rate (5-14yrs.) from 2010 To 2019



India had the highest children mortality rate (5-14yrs) in 2010 and also in 2019 having values 9.03 and 5.49 respectively. Indonesia and Thailand ranked as 2nd and 3rd highest countries in children mortality rate for both the year 2010 and 2019. Switzerland had the lowest value in 2010 and in 2019 having values 0.89 and 0.67 respectively (Table No.4.1.3.6 and Figure-4.1.3.5). Average children mortality rate is also highest in India from 2010 to 2019 having score 7.034. Indonesia and Thailand stand later having values 5.875 and 4.504 respectively. Switzerland and Sweden stand as lowest and 2nd lowest countries in average children mortality rate from 2010 to 2019 among the selected countries (Table No 4.1.3.8).

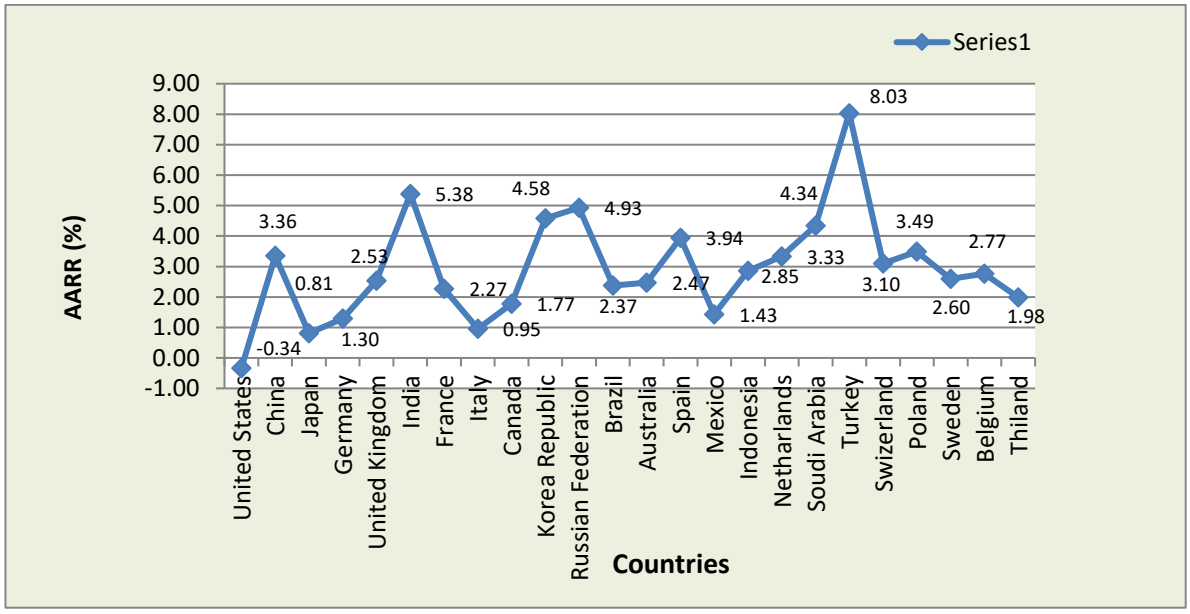
Table 4.1.3.9

Average Annual Rate of Reduction in Children Mortality Rate (5-14yrs) from 2010-2019 (%)

SL. No.	COUNTRIES	**AARR Of Children Mortality Rate (5-14YRS) from 2010-2019 (Highest to Lowest values)**
1	**Turkey**	8.03
2	**India**	5.38
3	**Russian Federation**	4.93
4	**Korea Republic**	4.58
5	**Saudi Arabia**	4.34
6	**Spain**	3.94
7	**Poland**	3.49
8	**China**	3.36
9	**Netherlands**	3.33
10	**Switzerland**	3.10
11	**Indonesia**	2.85
12	**Belgium**	2.77
13	**Sweden**	2.60
14	**United Kingdom**	2.53
15	**Australia**	2.47
16	**Brazil**	2.37
17	**France**	2.27
18	**Thailand**	1.98
19	**Canada**	1.77
20	**Mexico**	1.43
21	**Germany**	1.30
22	**Italy**	0.95
23	**Japan**	0.81
24	**United States**	-0.34
Data interpreted from WHO Global Health Observatory, updated last 19.05.2021		

Figure 4.1.3.6

Average Annual Rate of Reduction in Children Mortality Rate (5-14yrs) from 2010-2019,(%)



India has achieved much progress ranking as 2nd highest country (39.20%) in decreasing percentage of mortality rate among children (5-14yrs) between the year 2010 and year 2019 and also ranks as 2nd highest (5.38%) in Average Annual Rate of Reduction in children mortality (5-14 Yrs.) from 2010-2019 (Table 4.1.3.9 and Figure-4.1.3.6).Turkey stands as highest country in percentage of reduction of children mortality rate between 2010 and 2019. Only United States shows the increasing tendency in children mortality rate between 2010 and 2019. (Table No. 4.1.3.7).

Table 4.1.3.10

Adult Mortality Rate (15-60 Yrs.), in the Year 2010 (Highest to Lowest Value)

SL. No.	Adult Mortality Rate (15-60 Yrs.), in the Year 2010 (Highest to Lowest value)					
	Countries	**Both sex**	**Countries**	**Male**	**Countries**	**Female**
1	**Russian Federation**	250.6	**Russian Federation**	362.8	**India**	159.8
2	**India**	194.4	**India**	225.8	**Indonesia**	156.1
3	**Indonesia**	187	**Thailand**	215.9	**Russian Federation**	135.9
4	**Thailand**	161.2	**Indonesia**	215.4	**Thailand**	105.9
5	**Brazil**	154.3	**Brazil**	208	**Brazil**	100.1
6	**Mexico**	135.6	**Poland**	189.5	**Mexico**	92.79
7	**Poland**	131.2	**Mexico**	178.1	**Saudi Arabia**	86.04
8	**Turkey**	116.2	**Turkey**	155.2	**Turkey**	78.92
9	**United States**	105.2	**United States**	131.6	**United States**	78.26
10	**Saudi Arabia**	97.12	**France**	115.5	**China**	74.06
11	**China**	87.96	**Korea Republic**	107.6	**Poland**	71.26
12	**France**	85.28	**Saudi Arabia**	104.9	**Belgium**	59.47
13	**Belgium**	81.24	**Belgium**	102.4	**United Kingdom**	56.99
14	**Germany**	77.52	**China**	101.1	**Netherlands**	54.71
15	**Korea Republic**	76.04	**Germany**	101	**France**	54.57
16	**United Kingdom**	73.79	**United Kingdom**	90.56	**Germany**	53.3
17	**Canada**	68.89	**Spain**	88.17	**Canada**	52.27
18	**Spain**	64.63	**Canada**	85.22	**Australia**	46.05
19	**Netherlands**	64.33	**Japan**	80.9	**Korea Republic**	43.48
20	**Australia**	63.06	**Australia**	79.77	**Sweden**	43.18
21	**Japan**	61.36	**Italy**	74.85	**Switzerland**	42.58
22	**Sweden**	57.87	**Netherlands**	73.71	**Japan**	40.99
23	**Italy**	57.76	**Sweden**	71.96	**Italy**	40.72
24	**Switzerland**	57.03	**Switzerland**	71.1	**Spain**	40.47
Data computed from the data of WHO Global Health Observatory, Last updated 07.05. 2018						

Table 4.1.3.11

Adult Mortality Rate (15-60 Yrs.), in the Year 2016 (Highest To Lowest Value)

Adult Mortality Rate (15-60 Yrs.), in the Year 2016 (Highest to Lowest value)								
SL No.	**Countries**	**Both sex**		**Countries**	**Male**		**Countries**	**Female**
1	**Russian Federation**	202.7		**Russian Federation**	294.2		**Indonesia**	145.6
2	**India**	178		**India**	214		**India**	138.4
3	**Indonesia**	175.6		**Indonesia**	204.6		**Russian Federation**	111.5
4	**Thailand**	147.4		**Thailand**	202.8		**Thailand**	91.47
5	**Brazil**	142.8		**Brazil**	193.5		**Brazil**	91.38
6	**Mexico**	126.6		**Mexico**	163.9		**Mexico**	89.49
7	**United States**	114.1		**Poland**	157.8		**United States**	85.59
8	**Poland**	110.6		**United States**	141.7		**Saudi Arabia**	77.77
9	**Turkey**	104		**Turkey**	137.9		**Turkey**	70.85
10	**Saudi Arabia**	89.13		**Saudi Arabia**	96.73		**China**	67.34
11	**China**	80.36		**France**	93.52		**Poland**	62.17
12	**Belgium**	71.56		**China**	92.68		**Belgium**	53.76
13	**France**	70.98		**Belgium**	88.74		**United Kingdom**	52.15
14	**Germany**	68.69		**Germany**	87.93		**Netherlands**	51.54
15	**United Kingdom**	66.68		**Korea Republic**	84.82		**Canada**	49.09
16	**Canada**	62.83		**United Kingdom**	81.23		**Germany**	48.71
17	**Korea Republic**	60.81		**Australia**	76.56		**France**	48.23
18	**Australia**	60.73		**Canada**	76.3		**Australia**	44.79
19	**Netherlands**	58.63		**Spain**	73.55		**Sweden**	39.87
20	**Spain**	55.79		**Italy**	67.78		**Italy**	39.24
21	**Italy**	53.53		**Netherlands**	65.56		**Spain**	37.76
22	**Sweden**	52.43		**Japan**	65.47		**Switzerland**	36.15
23	**Japan**	50.83		**Sweden**	64.45		**Korea Republic**	35.98
24	**Switzerland**	49.2		**Switzerland**	61.77		**Japan**	35.61
Data computed from the data of WHO Global Health Observatory, Last updated 07.05. 2018								

Table -4.1.3.12

Percentage of Reduction in Adult Mortality Rate Between 2010 and 2016

Percentage of Reduction in Adult Mortality rate between 2010 & 2016 (Highest to Lowest value) (%)								
SL No.	**Countries**	**Both Sex**		**Countries**	**Male**		**Countries**	**Female**
1	**Korea Republic**	20.03		**Korea Republic**	21.17		**Russian Federation**	17.95
2	**Russian Federation**	19.11		**Japan**	19.07		**Korea Republic**	17.25
3	**Japan**	17.16		**France**	19.03		**Switzerland**	15.10
4	**France**	16.77		**Russian Federation**	18.91		**Thailand**	13.63
5	**Poland**	15.70		**Poland**	16.73		**India**	13.39
6	**Switzerland**	13.73		**Spain**	16.58		**Japan**	13.13
7	**Spain**	13.68		**Belgium**	13.34		**Poland**	12.76
8	**Belgium**	11.92		**Switzerland**	13.12		**France**	11.62
9	**Germany**	11.39		**Germany**	12.94		**Turkey**	10.23
10	**Turkey**	10.50		**Turkey**	11.15		**Saudi Arabia**	9.61
11	**United Kingdom**	9.64		**Netherlands**	11.06		**Belgium**	9.60
12	**Sweden**	9.40		**Canada**	10.47		**China**	9.07
13	**Netherlands**	8.86		**Sweden**	10.44		**Brazil**	8.71
14	**Canada**	8.80		**United Kingdom**	10.30		**Germany**	8.61
15	**China**	8.64		**Italy**	9.45		**United Kingdom**	8.49
16	**Thailand**	8.56		**China**	8.33		**Sweden**	7.67
17	**India**	8.44		**Mexico**	7.97		**Indonesia**	6.73
18	**Saudi Arabia**	8.23		**Saudi Arabia**	7.79		**Spain**	6.70
19	**Brazil**	7.45		**Brazil**	6.97		**Canada**	6.08
20	**Italy**	7.32		**Thailand**	6.07		**Netherlands**	5.79
21	**Mexico**	6.64		**India**	5.23		**Italy**	3.63
22	**Indonesia**	6.10		**Indonesia**	5.01		**Mexico**	3.56
23	**Australia**	3.69		**Australia**	4.02		**Australia**	2.74
24	**United States**	-8.46		**United States**	-7.67		**United States**	-9.37
Data computed from the data of WHO Global Health Observatory, Last updated 07.05. 2018								

Table 4.1.3.13

Average Adult Mortality Rate from 2010 to 2016

Average Adult Mortality rate from 2010 to 2016 (Highest to Lowest value)								
SL No.	Countries	Both sex		Countries	Male		Countries	Female
1	Russian Federation	223.23		Russian Federation	323.83		Indonesia	151.40
2	India	185.91		India	220.60		India	147.66
3	Indonesia	181.21		Thailand	209.80		Russian Federation	122.07
4	Thailand	153.80		Indonesia	209.33		Thailand	97.09
5	Brazil	148.27		Brazil	200.30		Brazil	95.65
6	Mexico	130.06		Poland	173.73		Mexico	90.42
7	Poland	120.96		Mexico	169.61		Saudi Arabia	81.60
8	Turkey	109.97		Turkey	146.14		United States	80.72
9	United States	107.49		United States	133.60		Turkey	75.07
10	Saudi Arabia	92.80		France	104.07		China	70.48
11	China	83.98		Saudi Arabia	100.48		Poland	66.73
12	France	77.75		China	96.76		Belgium	56.65
13	Belgium	76.26		Korea Republic	95.98		United Kingdom	54.09
14	Germany	72.58		Belgium	95.27		Netherlands	52.59
15	United Kingdom	69.41		Germany	93.63		France	51.16
16	Korea Republic	68.11		United Kingdom	84.74		Canada	50.95
17	Canada	65.84		Canada	80.45		Germany	50.81
18	Australia	61.21		Spain	80.13		Australia	45.26
19	Netherlands	61.15		Australia	77.00		Sweden	42.50
20	Spain	59.80		Japan	73.10		Italy	40.05
21	Japan	56.35		Italy	71.28		Korea Republic	39.32
22	Italy	55.66		Netherlands	69.50		Spain	39.06
23	Sweden	55.64		Sweden	68.23		Japan	38.93
24	Switzerland	52.49		Switzerland	65.80		Switzerland	38.73
Data computed from the data of WHO Global Health Observatory, Last updated 07.05. 2018								

Figure 4.1.3.7

Average Annual Adult Mortality Rate (2010 to 2016)

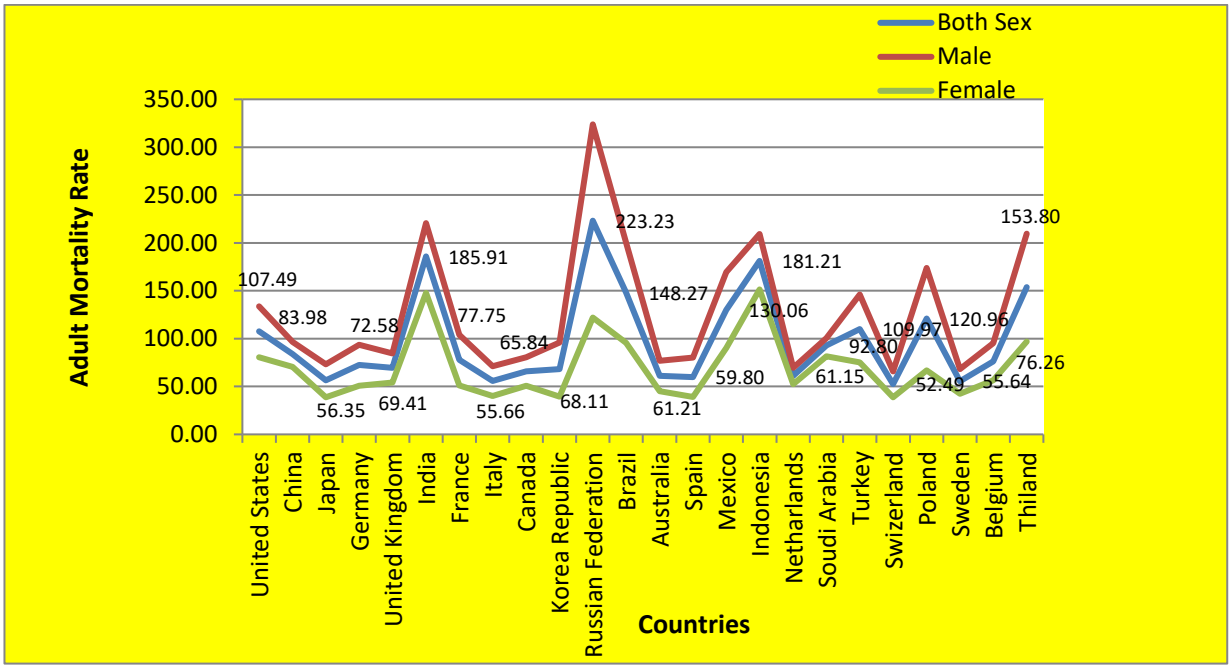


Figure 4.1.3.8

Average Annual Rate of Reduction in Adult Mortality Rate (15-60 Yrs.) from 2010 to 2016(%)

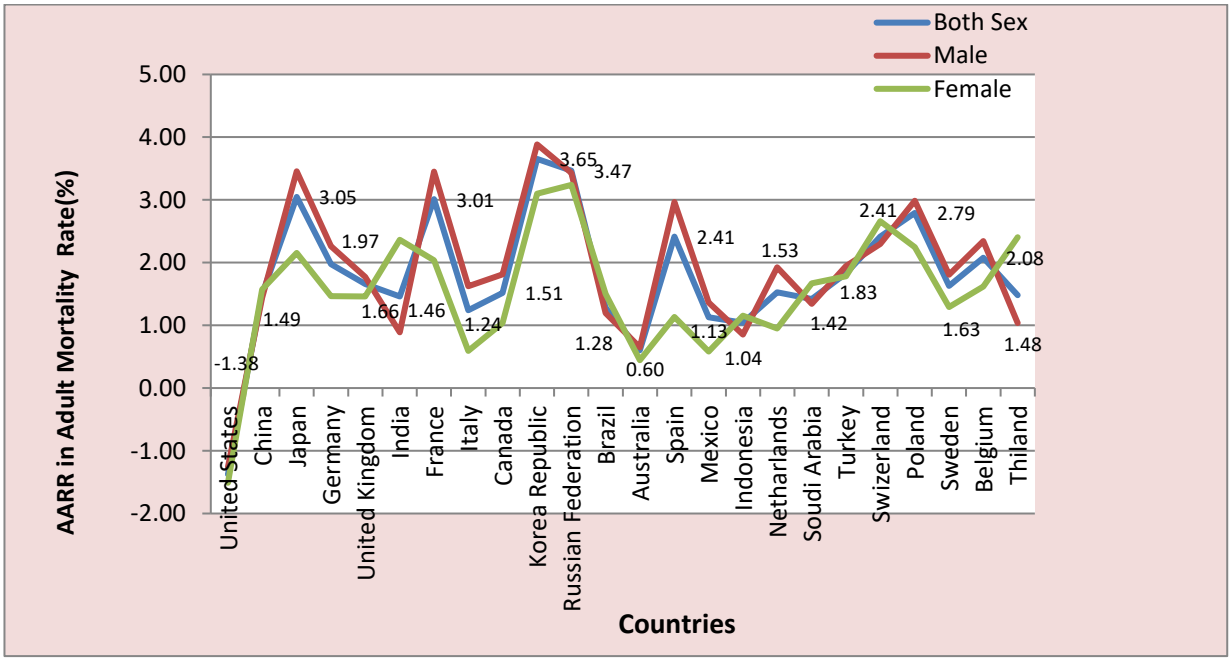


Table 4.1.3.14

Average Annual Rate of Reduction in Adult Mortality Rate From 2010 to 2016 (%)

Percentage of average annual Reduction of Adult Mortality Rate from 2010 to 2016. (Highest to Lowest value)								
SL. No.	Countries	Both Sex		Countries	Male		Countries	Female
1	**Korea Republic**	3.65		**Korea Republic**	3.88		**Russian Federation**	3.24
2	**Russian Federation**	3.47		**Japan**	3.46		**Korea Republic**	3.10
3	**Japan**	3.05		**France**	3.45		**Switzerland**	2.66
4	**France**	3.01		**Russian Federation**	3.43		**Thailand**	2.41
5	**Poland**	2.79		**Poland**	2.98		**India**	2.37
6	**Switzerland**	2.41		**Spain**	2.97		**Poland**	2.24
7	**Spain**	2.41		**Belgium**	2.34		**Japan**	2.16
8	**Belgium**	2.08		**Switzerland**	2.30		**France**	2.04
9	**Germany**	1.97		**Germany**	2.26		**Turkey**	1.78
10	**Turkey**	1.83		**Turkey**	1.95		**Saudi Arabia**	1.67
11	**United Kingdom**	1.66		**Netherlands**	1.92		**Belgium**	1.62
12	**Sweden**	1.63		**Canada**	1.81		**China**	1.57
13	**Netherlands**	1.53		**Sweden**	1.81		**Brazil**	1.50
14	**Canada**	1.51		**United Kingdom**	1.77		**Germany**	1.47
15	**China**	1.49		**Italy**	1.62		**United Kingdom**	1.46
16	**Thailand**	1.48		**China**	1.44		**Sweden**	1.29
17	**India**	1.46		**Mexico**	1.36		**Indonesia**	1.15
18	**Saudi Arabia**	1.42		**Saudi Arabia**	1.34		**Spain**	1.13
19	**Brazil**	1.28		**Brazil**	1.20		**Canada**	1.04
20	**Italy**	1.24		**Thailand**	1.04		**Netherlands**	0.95
21	**Mexico**	1.13		**India**	0.89		**Italy**	0.59
22	**Indonesia**	1.04		**Indonesia**	0.85		**Mexico**	0.58
23	**Australia**	0.60		**Australia**	0.65		**Australia**	0.45
24	**United States**	-1.38		**United States**	-1.26		**United States**	-1.51
Data computed from the data of WHO Global Health Observatory, Last updated 07.05. 2018								

Adult mortality rates for both sex and for male were highest in 2010 and in 2016 in Russian federation having values 250.6 and 362.8 (2010) and 202.7 and 294.2 (2016) respectively among all the selected countries. In case of average annual mortality rate from 2010 to 2016, Russian Federation also comes first with highest values for both sex and for male 223.23 and 323.83 respectively. Indonesia also holds the highest average mortality rate for female from 2010 to 2016 with value 151.40 (Table-4.3.10, 4.3.11 and 4.3.13.).

India stands for 2nd highest country having adult mortality rate for both sex and in male in 2010 and 2016, 194.4 and 225.8 (2010) and 178 and 214 (2016) respectively among all the selected countries). India also holds the highest rank in adult mortality rate for Female in 2010 having value 159.8 and holds the 2nd highest rank for female adult mortality rate in 2016 having value 138.4, just after Indonesia (145.6). Switzerland stands for the lowest country among all in adult mortality rate for both sex and for male in 2010 and 2016 having values 57.03 and 71.1 (2010) and 49.2 and 61.77 (2016) respectively. Spain ranked as the lowest country in female adult mortality rate in 2010 bearing value 35.61 and Japan ranked as the lowest scoring country in female adult mortality rate in 2016 having value 35.61 ((Table 4.3.10 and 4.3.11). In case of average annual mortality rate from 2010 to 2016 India holds the 2nd highest position in all categories (Both sex, male and female) having values 185.91, 220.60 and 147.66. Switzerland ranks as the lowest scoring countries in average annual mortality rate from 2010 to 2016 in both sex, male and female with values 52.49, 65.80 and 38.73 respectively (Table 4.1.3.13) (Figure 4.1.3.7).

If we evaluate the trend in decreasing the percentage of adult mortality rate between 2010 and 2016, it is found that highest progress is done by Republic of Korea for both sex and for male categories having values 20.03% and 21.17% respectively. Adult mortality -reduction % in female category between 2010 and 2016 was highest in Russian Federation (17.95%). United States is showing increasing tendency in percentage of Adult Mortality between 2010 and 2016 for both sex for male and for female category. In case of percentage of Average Annual Rate of Reduction in adult mortality rate, highest decreasing tendency also is found in Korea Republic for both sex and for male (Table 4.1.3.12).

India's achievement regarding Average Annual Rate of Reduction in Adult mortality rate between 2010 and 2016 and also in avg. annual decreasing percentage of adult mortality rate from 2010 to 2016 are not satisfactory in respect of other selected countries. United States of America shows the increasing tendency in adult mortality rate from 2010 to 2016 (Table-4.1.3.12 and Table-4.1.3.14). In India, % of annual average reduction in adult mortality rate is higher in female category than that of male having rank 21st in male and 5th in female among the selected 24 countries (Table 4.1.3.14) (Figure 4.1.3.8).

Table 4.1.3.15

Correlation between Avg. Annual Health Expenditure(% of GDP) and Average Children Mortality Rate(5-14 Yrs.) (2010 to 2019)

Correlation between avg. annual health expenditure(% of GDP) & average children mortality rate(5-14)(2010 to 2019)		
r	Value	-0.723
N		24
df		22
T. Statistic		4.908
p value		0.00066

*r stands for Pearson coefficient Correlation,*N = Number of observation,* df=Degree of Freedom, *T. Statistic= Test Statistic*P value stands for Probability value.

Figure 4.1.3.9

Correlation between Average Current Health Expenditure (% of GDP) and Average Children Mortality Rate (5-14yrs), (2010-2019)

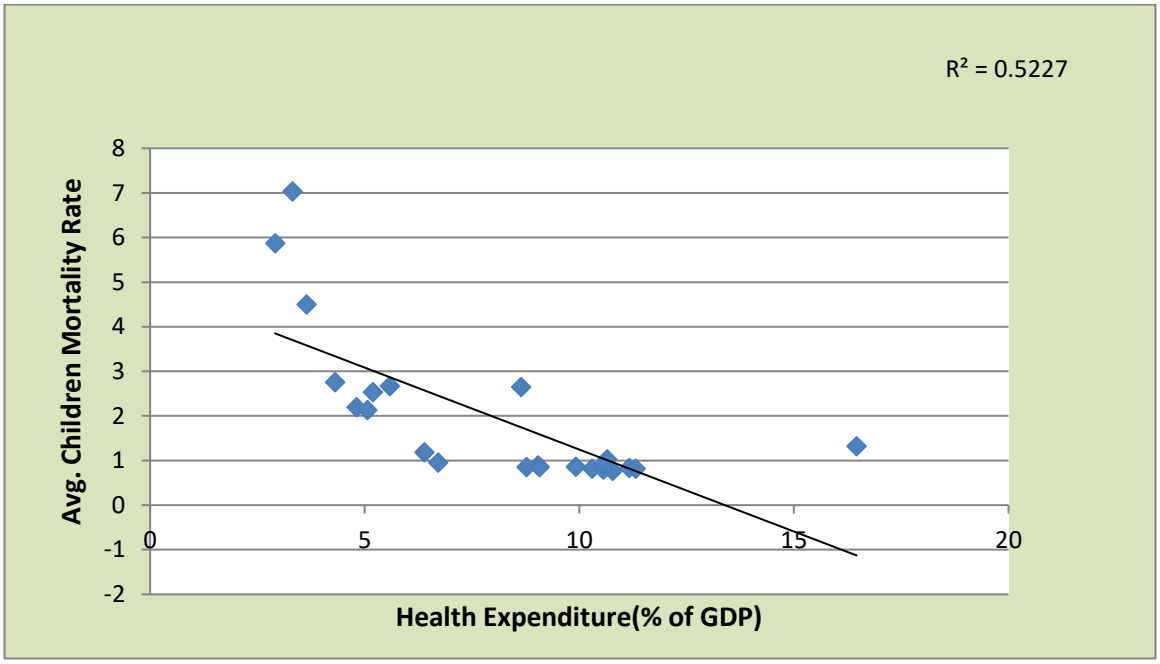


Table 4.1.3.16

Correlation between Avg. GGHE-D and Average Children Mortality Rate(5-14 Yrs.),(2010 to 2019)

Correlation between avg. annual Domestic General Government health expenditure(% of CHE) & average children mortality rate(5-14)(2010 to 2019)	
r	Value -0.585
N	24
df	22
T. Statistic	3.387
p value	0.003
*r stands for Pearson coefficient Correlation,*N = Number of observation,* df=Degree of Freedom, *T. Statistic= Test Statistic*P value stands for Probability value.	

Figure 4.1.3.10

Correlation between Avg. GGHE-D (% CHE) and Avg. Children Mortality Rate (5-14 Yrs.) 2010-2019

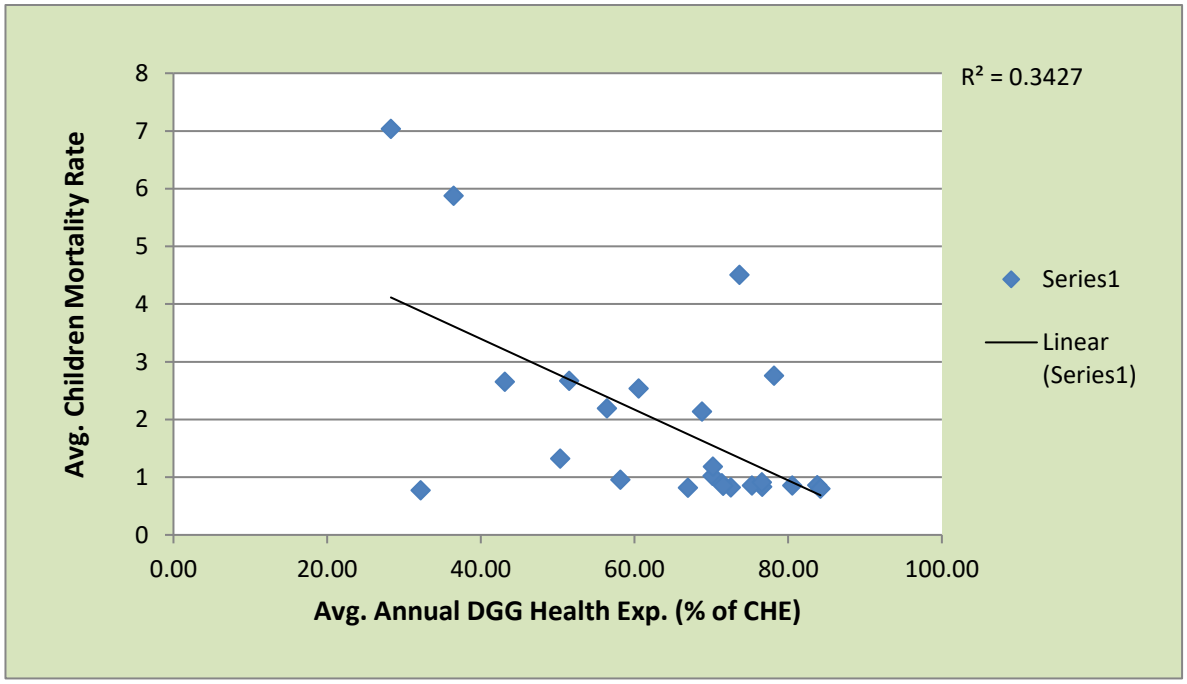


Table 4.1.3.17

Correlation between Avg. Annual Health Expenditure (%) of GDP and Avg. Annual Adult Mortality Rate (15-60yrs) from 2010-2016

Correlation between avg. annual Health expenditure (%) of GDP and avg. annual adult Mortality rate (15-60yrs) from 2010-2016.			
Value	Both Sex	Male	Female
r	-0.606	-0.568	-0.619
N	24	24	24
df	22	22	22
T Statistic	3.576	3.24	3.694
p value	0.0016	0.0038	0.0013

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Figure 4.1.3.11

Correlation between Avg. Annual Health Expenditure (% of GDP) and Avg. Annual Adult Mortality (15-60 Yrs.) from 2010-2016

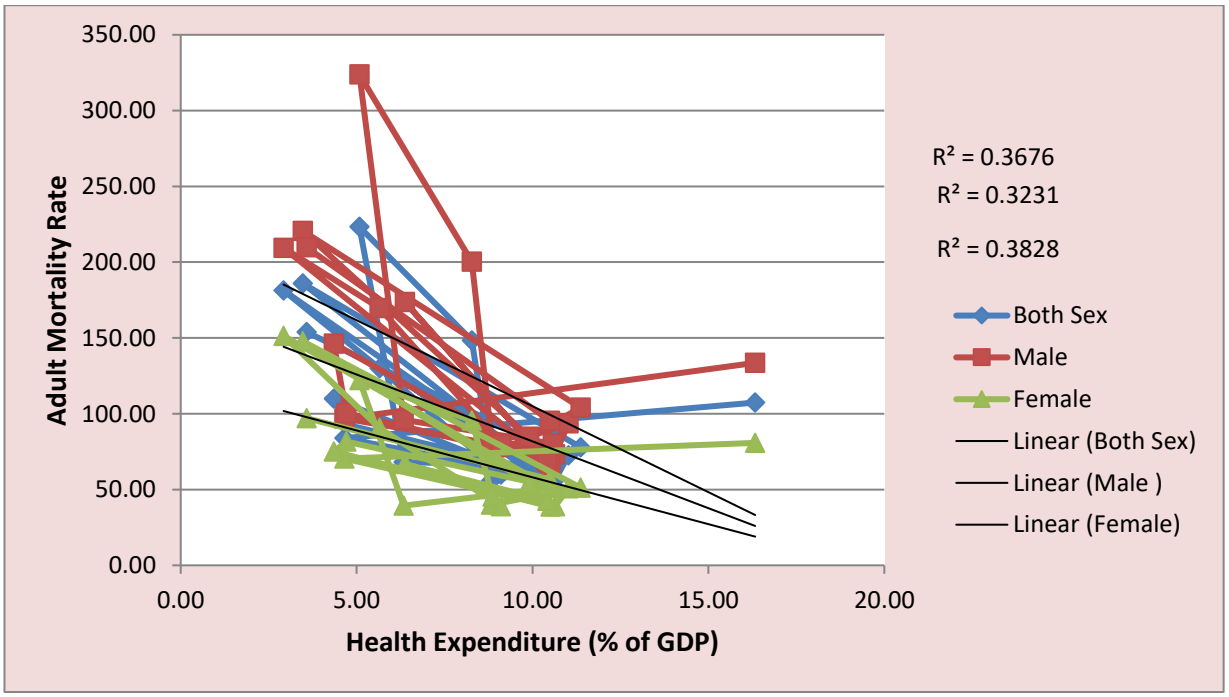


Table 4.1.3.18

Correlation between Avg. GGHE-D (% of CHE) And Avg. Adult Mortality Rate (15-60 Yrs.)(2010-2016)

Correlation between Avg. Domestic General Government Health expenditure(% of CHE) and avg. Adult mortality rate (15-60 yrs.)(2010-2016)			
Value	Both Sex	Male	Female
r	-0.516	-4.301	-0.627
N	24	24	24
df	22	22	22
T Statistic	2.82	2.24	3.78
p value	0.009	0.035	0.001

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Figure 4.1.3.12

Correlation between Avg. GGHE-D (%of CHE) and Avg. Adult Mortality Rate from 2010-2016

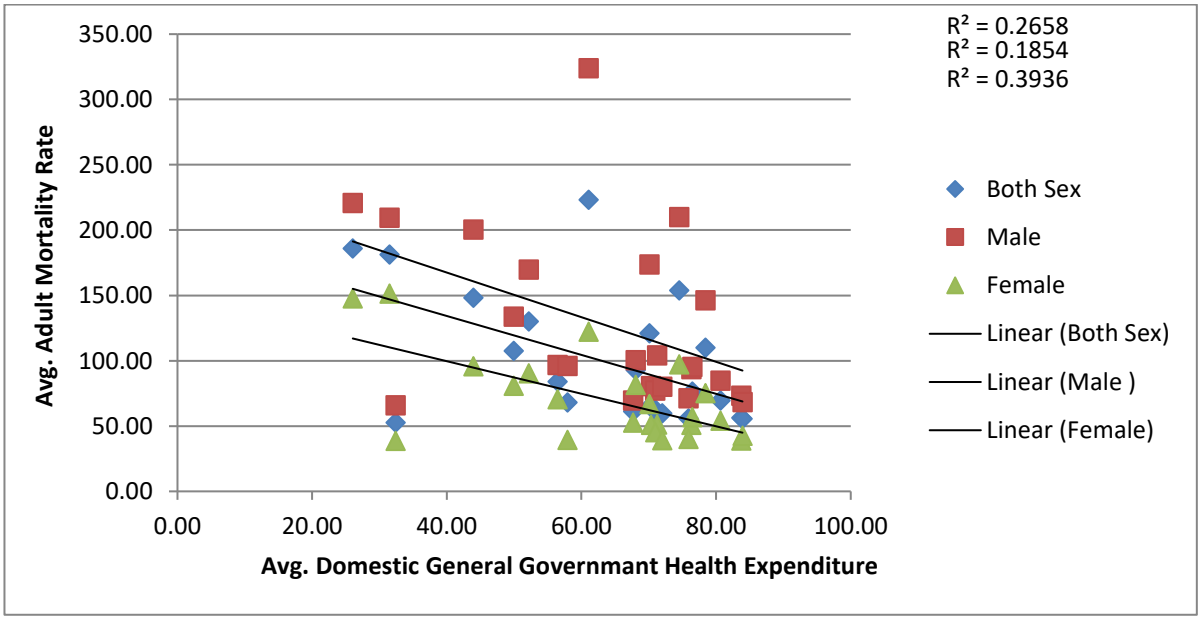


Table 4.1.3.19

Correlation between Avg. Out Of Pocket Expenditure(% of CHE) and Average Children Mortality Rate(5-14) (2010 to 2019)

Correlation between avg. Out Of Pocket expenditure(% of CHE) & average children mortality rate (5-14)(2010 to 2019)	
r	Value 0.701
N	24
df	22
T. Statistic	4.607
p value	0.00013
*r stands for Pearson coefficient Correlation,*N = Number of observation,* df=Degree of Freedom, *T. Statistic= Test Statistic*P value stands for Probability value.	

Negative correlation exists between average annual health expenditure (% of GDP) & average annual children mortality (5-14yrs) from 2010 to 2019 having value r(24)= -0.723, p= 0.0006≤0.05, df =(N-2)=22,(Table 4.1.3.15)(Figure 4.1.3.9).

Negative correlation also exists between average annual Domestic General Government health expenditure (% of GDP) and average annual children mortality (5-14yrs) from 2010 to 2019 having value r(24)= -0.585, p= 0.003 ≤0.05, df =(N-2)=22,(Table-4.3.16)(Figure 4.3.10).

Table 4.1.3.20

Correlation between Avg. Out Of Pocket Expenditure (% of CHE) & Average Adult Mortality Rate(15-60 Yrs.) (2010 To 2016)

Value of	Both Sex	Male	Female
r	0.617	0.545	0.694
N	24	24	24
df	22	22	22
T Statistic	3.681	3.051	4.521
p value	0.0013	0.0059	0.0002
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.			

Table *4.1.3.21*

Correlation between Avg. Out of Pocket Expenditure (% of CHE) and Average Children Mortality Rate(U-5 Yrs.) (2010 to 2019)

r	Value	0.79
N		24
df		22
T. Statistic		6.05
p value		0.000004

*r stands for Pearson coefficient Correlation,*N = Number of observation,* df=Degree of Freedom, *T Statistic= Test Statistic*P value stands for Probability value.

Negative correlation is found between average annual Domestic General Government Health Expenditure(% of CHE) and average annual adult mortality rate (15-60yrs) from 2010 to 2016 having value for both sex r(24)= -0.516, p= 0.009 ≤0.05, for Male r(24)= -4.301, p= 0.035 ≤0.05 and for female r(24)= -0.627, p= 0.001 ≤0.05.(Table No. 4.3.17, Figure No. 4.1.3.12).

Positive correlation exists between average Out Of Pocket expenditure (% of CHE) and average annual children mortality (5-14yrs) from 2010 to 2019 having value r(24)= 0.701, p= 0.00013 ≤0.05, df =(N-2)=22,(Table-4.1.3.19).

Positive correlation is found between average Out Of Pocket Expenditure(% of CHE) and average annual adult mortality rate (15-60yrs) from 2010 to 2016 having value for both sex r(24)= 0.617, p= 0.001 ≤0.05, for Male r(24)=0.545, p=0.0059≤0.05, for female r(24)= 0.694, p= 0.0002 ≤0.05.(Table4.1.3.20).

Positive correlation exists between average Out Of Pocket expenditure (% of CHE) and average annual children mortality (U-5 yrs.) from 2010 to 2019 having value r(24)= 0.79, p= 0.000004 ≤0.05, df =(N-2)=22,(Table-4.1.3.21).

Table 4.1.3.22

Predicted Under Five Mortality Rate by 2030

Countries	U-5 Mortality Rate in 2021	Average Annual Rate of Reduction (2010-21)	Predicted U-5 Mortality Rate by 2030
United States	6.24	1.46	5.46
China	6.93	7.20	3.54
Japan	2.3	2.95	1.76
Germany	3.57	1.42	3.14
United Kingdom	4.19	1.89	3.53
India	30.62	5.66	18.13
France	4.35	-0.30	4.47
Italy	2.61	3.70	1.86
Canada	5.04	1.14	4.54
Korea Republic	2.89	3.17	2.16
Russian Federation	5.05	6.35	2.80
Brazil	14.41	2.27	11.72
Australia	3.71	2.24	3.03
Spain	3.05	2.09	2.52
Mexico	13.24	3.31	9.78
Indonesia	22.17	3.77	15.68
Netherlands	4.05	0.81	3.77
Saudi Arabia	6.72	5.31	4.11
Turkey	8.98	6.18	5.06
Switzerland	3.83	1.57	3.32
Poland	4.35	2.81	3.36
Sweden	2.46	1.96	2.06
Belgium	4.1	0.76	3.83
Thailand	8.29	4.37	5.54

India's under five mortality rate will be highest (18.13) by 2030 based on the AARR from 2010 to 2021, among all the selected countries. Predicted U-5 mortality rate will be lowest (1.76) in Japan by 2030. No country will enable to end U-5 mortality rate by 2030 (Table 4.1.3.22).

4.1.4 Healthy Life Expectancy (Hale):

Table 4.1.4.1

Healthy Life Expectancy (HALE) at Birth, (Yrs.). in 2010, (Highest to Lowest Value)

Healthy Life Expectancy (HALE) at Birth in The Year 2010 (Highest to Lowest value).								
SL No.	COUNTRIES	**Both Sex**		COUNTRIES	**Male**		COUNTRIES	**Female**
1	**Japan**	73		**Japan**	71.1		**Japan**	74.7
2	**Switzerland**	71.4		**Sweden**	70.7		**Korea Republic**	72.9
3	**France**	71.2		**Switzerland**	70.6		**France**	72.5
4	**Sweden**	71.2		**Netherlands**	70.3		**Italy**	72.2
5	**Italy**	71.1		**Italy**	70		**Spain**	72.2
6	**Spain**	71		**Canada**	69.9		**Switzerland**	72
7	**Korea Republic**	70.9		**Spain**	69.8		**Canada**	71.7
8	**Netherlands**	70.9		**France**	69.7		**Sweden**	71.7
9	**Canada**	70.8		**Australia**	69.2		**Netherlands**	71.4
10	**Australia**	70.2		**Germany**	69.1		**Australia**	71.2
11	**Germany**	70		**United Kingdom**	68.7		**Germany**	70.9
12	**United Kingdom**	69.4		**Korea Republic**	68.7		**Belgium**	70.4
13	**Belgium**	69.2		**Belgium**	68		**United Kingdom**	70.2
14	**Poland**	67.1		**Turkey**	66.3		**Poland**	70.2
15	**Thailand**	67.1		**United States**	65.7		**Thailand**	69.2
16	**Turkey**	66.9		**China**	65.3		**China**	68.2
17	**United States**	66.7		**Thailand**	65		**United States**	67.7
18	**China**	66.7		**Poland**	64		**Turkey**	67.6
19	**Mexico**	65.1		**Mexico**	63.6		**Mexico**	66.6
20	**Brazil**	63.9		**Brazil**	62		**Brazil**	65.9
21	**Saudi Arabia**	62.2		**Saudi Arabia**	61.9		**Russian Federation**	64.9
22	**Indonesia**	61.2		**Indonesia**	60.4		**Saudi Arabia**	62.6
23	**Russian Federation**	60.5		**India**	57		**Indonesia**	62
24	**India**	57.3		**Russian Federation**	56.2		**India**	57.6
Data computed from WHO Global Health Observatory, Last updated 04/12/2020								

Table 4.1.4.2

Healthy Life Expectancy (HALE) at Birth, (Yrs.). in 2015, (Highest to Lowest Value)

HEALTHY LIFE EXPECTANCY (HALE) AT BIRTH IN THE YEAR 2015 (Highest to Lowest value).								
SL No.	COUNTRIES	**Both Sex**		COUNTRIES	**Male**		COUNTRIES	**Female**
1	**Japan**	73.6		**Japan**	72		**Japan**	75.1
2	**Korea Republic**	72		**Switzerland**	71.2		**Korea Republic**	73.7
3	**France**	71.7		**Sweden**	71		**France**	72.9
4	**Switzerland**	71.7		**Netherlands**	70.9		**Italy**	72.4
5	**Italy**	71.6		**Italy**	70.7		**Spain**	72.4
6	**Spain**	71.6		**Spain**	70.6		**Switzerland**	72.3
7	**Sweden**	71.4		**France**	70.5		**Canada**	71.8
8	**Canada**	71.1		**Canada**	70.4		**Sweden**	71.8
9	**Netherlands**	71.1		**Korea Republic**	70.2		**Australia**	71.4
10	**Australia**	70.6		**Australia**	69.7		**Netherlands**	71.3
11	**Germany**	70.1		**Germany**	69.3		**Poland**	70.9
12	**Belgium**	70		**Belgium**	69.1		**Germany**	70.8
13	**United Kingdom**	69.7		**United Kingdom**	69		**Belgium**	70.8
14	**China**	68		**Turkey**	66.9		**United Kingdom**	70.3
15	**Poland**	68		**China**	66.6		**Thailand**	70.3
16	**Thailand**	68		**Thailand**	65.7		**China**	69.7
17	**Turkey**	67.7		**United States**	65.6		**Turkey**	68.4
18	**United States**	66.6		**Poland**	65.1		**United States**	67.5
19	**Mexico**	65.8		**Mexico**	64.3		**Mexico**	67.2
20	**Brazil**	64.7		**Brazil**	62.8		**Brazil**	66.7
21	**Saudi Arabia**	63.2		**Saudi Arabia**	62.8		**Russian Federation**	66.5
22	**Russian Federation**	62.7		**Indonesia**	61.5		**Saudi Arabia**	63.8
23	**Indonesia**	62.3		**India**	59.1		**Indonesia**	63.2
24	**India**	59.1		**Russian Federation**	58.8		**India**	59.2
Data computed from WHO Global Health Observatory, Last updated 04/12/2020								

Figure 4.1.4.1

Healthy Life Expectancy (HALE) at Birth (Yrs.) in 2010

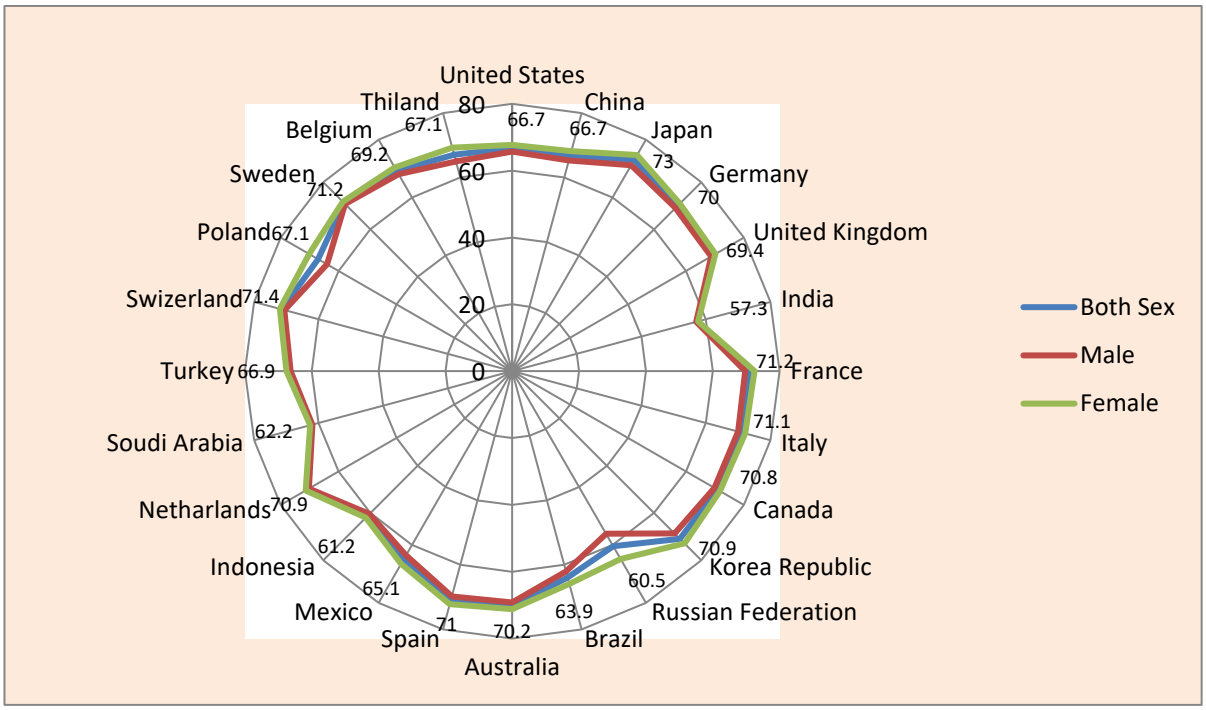


Figure 4.1.4.2

Healthy Life Expectancy at Birth(Yrs.) in 2015

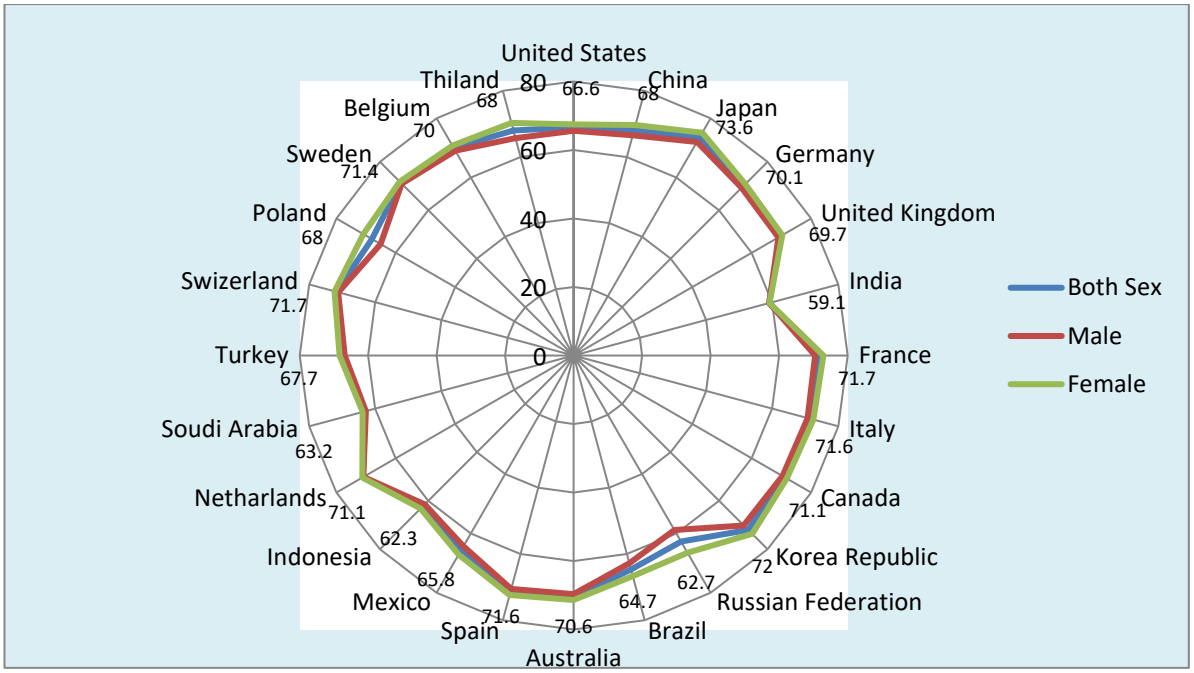


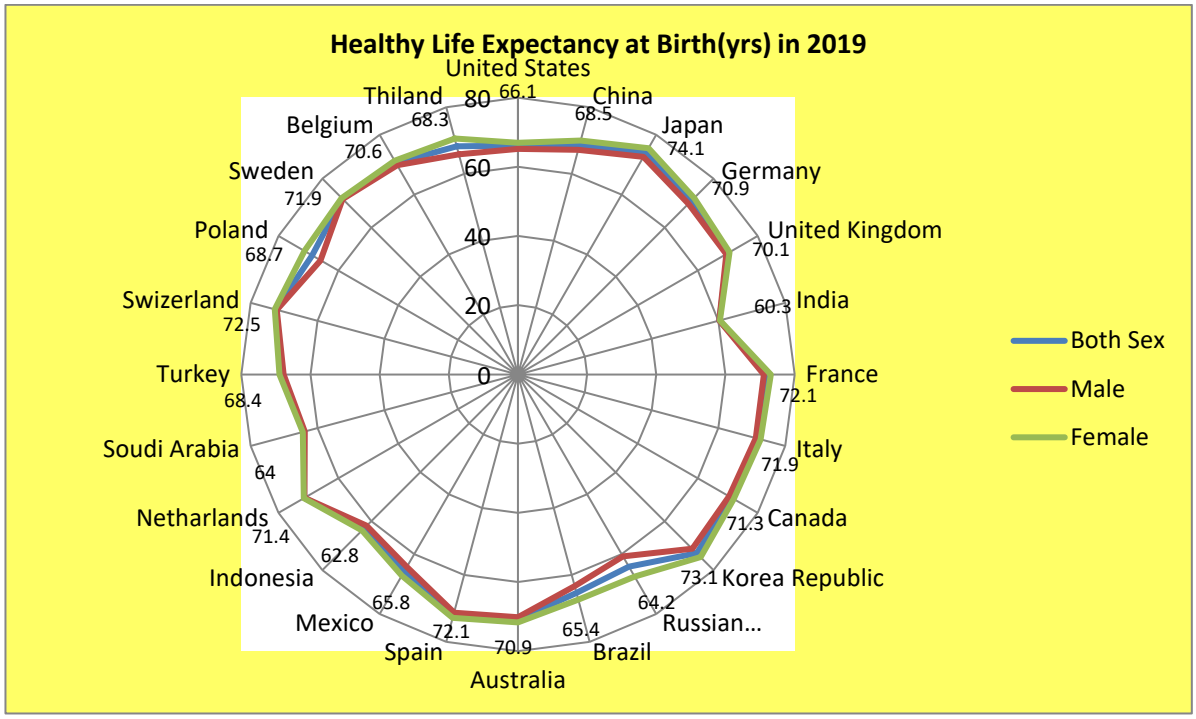
Table 4.1.4.3

Healthy Life Expectancy (HALE) at Birth, (Yrs.) in 2019

Healthy Life Expectancy (HALE) at Birth, (Yrs.) 2019 (Highest to Lowest Value)							
	YEAR 2019						
SL No.	COUNTRIES	**Both Sex**	COUNTRIES	**Male**	COUNTRIES	**Female**
1	**Japan**	74.1	**Japan**	72.6	**Japan**	75.5
2	**Korea Republic**	73.1	**Switzerland**	72.2	**Korea Republic**	74.7
3	**Switzerland**	72.5	**Sweden**	71.7	**France**	73.1
4	**France**	72.1	**Korea Republic**	71.3	**Spain**	72.9
5	**Spain**	72.1	**Spain**	71.3	**Switzerland**	72.8
6	**Italy**	71.9	**Netherlands**	71.3	**Italy**	72.6
7	**Sweden**	71.9	**Italy**	71.2	**Germany**	72.1
8	**Netherlands**	71.4	**France**	71.1	**Sweden**	72.1
9	**Canada**	71.3	**Canada**	70.5	**Canada**	72
10	**Germany**	70.9	**Australia**	70.2	**Australia**	71.7
11	**Australia**	70.9	**Belgium**	69.8	**Netherlands**	71.5
12	**Belgium**	70.6	**Germany**	69.7	**Poland**	71.3
13	**United Kingdom**	70.1	**United Kingdom**	69.6	**Belgium**	71.3
14	**Poland**	68.7	**Turkey**	67.8	**United Kingdom**	70.6
15	**China**	68.5	**China**	67.2	**Thailand**	70.6
16	**Turkey**	68.4	**Poland**	65.9	**China**	70
17	**Thailand**	68.3	**Thailand**	65.9	**Turkey**	69
18	**United States**	66.1	**United States**	65.2	**Russian Federation**	67.5
19	**Mexico**	65.8	**Mexico**	64.3	**Brazil**	67.4
20	**Brazil**	65.4	**Saudi Arabia**	63.8	**Mexico**	67.2
21	**Russian Federation**	64.2	**Brazil**	63.4	**United States**	67
22	**Saudi Arabia**	64	**Indonesia**	61.9	**Saudi Arabia**	64.4
23	**Indonesia**	62.8	**Russian Federation**	60.7	**Indonesia**	63.8
24	**India**	60.3	**India**	60.3	**India**	60.4
Data interpreted from WHO Global Health Observatory.						

Figure 4.1.4.3

Healthy Life Expectancy at t Birth (Yrs.) in 2019



Japan holds the first position having highest healthy life expectancy at birth in 2010, 2015 and in 2019 for both sex, for male and also for female category among the selected countries having values 73, 71.1 and 74.7(Both sex, male and female in 2010), 73.6, 72 and 75.1(Both sex, male and female in 2015) and 74.1, 72.6 and 75.5(Both sex, male and female in 2019). India ranks as the lowest country in healthy life expectancy at birth in 2010 and 2015 for both sex and for female and in 2019 for both sex, for male and for female also having values 57.3 and 57.6 (Both sex and female in 2010), 59.1 and 59.2(Both sex and female in 2015) and 60.3, 60.3 and 60.4 (Both sex, Male and Female in 2019). India ranks as the 2nd lowest country in HALE at birth for male in 2010 and 2015 having values 57 and 59.1 respectively. Russian Federation holds the lowest rank in healthy life expectancy at birth in 2010 and 2015 for male category having values 56.2 and 58.8 respectively (Table No. 4.1.4.1 , 4.1.4.2 and 4.1.4.3) (Figure 4.1.4.1-4.1.4.3).

Table 4.1.4.4

Healthy Life Expectancy (HALE) at 60 Yrs. in Year 2010

Healthy Life Expectancy (HALE) at 60 Yrs. in 2010, (Highest to lowest value)							
SL. No.	COUNTRIES	**Both Sex**		COUNTRIES	**Male**	COUNTRIES	**Female**
1	**Japan**	19.69		**France**	17.86	**Japan**	21.34
2	**France**	19.32		**Japan**	17.84	**France**	20.6
3	**Switzerland**	18.9		**Switzerland**	17.83	**Switzerland**	19.83
4	**Canada**	18.55		**Canada**	17.62	**Spain**	19.79
5	**Spain**	18.52		**Sweden**	17.49	**Korea Republic**	19.7
6	**Italy**	18.44		**Australia**	17.48	**Italy**	19.58
7	**Australia**	18.39		**Spain**	17.15	**Canada**	19.39
8	**Sweden**	18.28		**Italy**	17.12	**Australia**	19.27
9	**Korea Republic**	18.22		**Netherlands**	17.02	**Sweden**	19.02
10	**Netherlands**	18.05		**United Kingdom**	16.94	**Netherlands**	18.98
11	**Germany**	17.79		**Germany**	16.73	**Germany**	18.8
12	**United Kingdom**	17.78		**Thailand**	16.67	**Belgium**	18.65
13	**Belgium**	17.52		**Korea Republic**	16.42	**United Kingdom**	18.56
14	**Thailand**	17.37		**Belgium**	16.26	**Thailand**	18
15	**United States**	16.46		**United States**	15.6	**Poland**	17.73
16	**Poland**	16		**Mexico**	15.2	**United States**	17.21
17	**Turkey**	15.94		**Turkey**	15.1	**Turkey**	16.75
18	**Mexico**	15.92		**Brazil**	14.45	**Brazil**	16.65
19	**Brazil**	15.61		**China**	14	**Mexico**	16.57
20	**China**	14.91		**Poland**	13.91	**China**	15.93
21	**Russian Federation**	13.37		**Saudi Arabia**	12.64	**Russian Federation**	15.15
22	**Indonesia**	13.02		**Indonesia**	12.48	**Indonesia**	13.53
23	**Saudi Arabia**	12.98		**India**	12.12	**Saudi Arabia**	13.39
24	**India**	12.57		**Russian Federation**	10.98	**India**	13.03
Data interpreted from data of WHO Global Health Observatory, last updated 04.12.2020							

Table 4.1.4.5

Healthy Life Expectancy (Hale) at 60 Yrs. in 2015

Healthy Life Expectancy (HALE) at 60 Yrs. In 2015, (Highest to lowest value)								
SL No.	COUNTRIES	**Both Sex**		COUNTRIES	**Male**		COUNTRIES	**Female**
1	**Japan**	20.04		**Japan**	18.39		**Japan**	21.54
2	**France**	19.48		**Switzerland**	18.16		**France**	20.67
3	**Switzerland**	19.05		**France**	18.15		**Korea Republic**	20.35
4	**Korea Republic**	18.97		**Canada**	18.04		**Spain**	19.96
5	**Canada**	18.83		**Australia**	17.88		**Switzerland**	19.85
6	**Spain**	18.79		**Sweden**	17.84		**Italy**	19.63
7	**Italy**	18.64		**Spain**	17.53		**Canada**	19.56
8	**Australia**	18.63		**Italy**	17.52		**Australia**	19.38
9	**Sweden**	18.5		**Netherlands**	17.41		**Sweden**	19.12
10	**Netherlands**	18.12		**Korea Republic**	17.32		**Belgium**	18.83
11	**Thailand**	17.89		**United Kingdom**	17.14		**Netherlands**	18.78
12	**United Kingdom**	17.86		**Thailand**	16.98		**Germany**	18.7
13	**Belgium**	17.86		**Belgium**	16.81		**Thailand**	18.69
14	**Germany**	17.72		**Germany**	16.69		**United Kingdom**	18.53
15	**United States**	16.51		**United States**	15.7		**Poland**	18.15
16	**Poland**	16.44		**Mexico**	15.34		**United States**	17.26
17	**Turkey**	16.2		**Turkey**	15.21		**Turkey**	17.08
18	**Mexico**	16.11		**Brazil**	14.83		**Brazil**	16.92
19	**Brazil**	15.94		**China**	14.61		**Mexico**	16.82
20	**China**	15.63		**Poland**	14.39		**China**	16.76
21	**Russian Federation**	14.44		**Saudi Arabia**	13.27		**Russian Federation**	16.11
22	**Saudi Arabia**	13.61		**India**	12.81		**Saudi Arabia**	14.06
23	**Indonesia**	13.18		**Indonesia**	12.54		**Indonesia**	13.8
24	**India**	13.06		**Russian Federation**	12.11		**India**	13.32
Data interpreted from data of WHO Global Health Observatory, last updated 04.12.2020								

FIGURE 4.1.4.4

Healthy Life Expectancy (HALE) at 60yrs. in 2010 (In Yrs.)

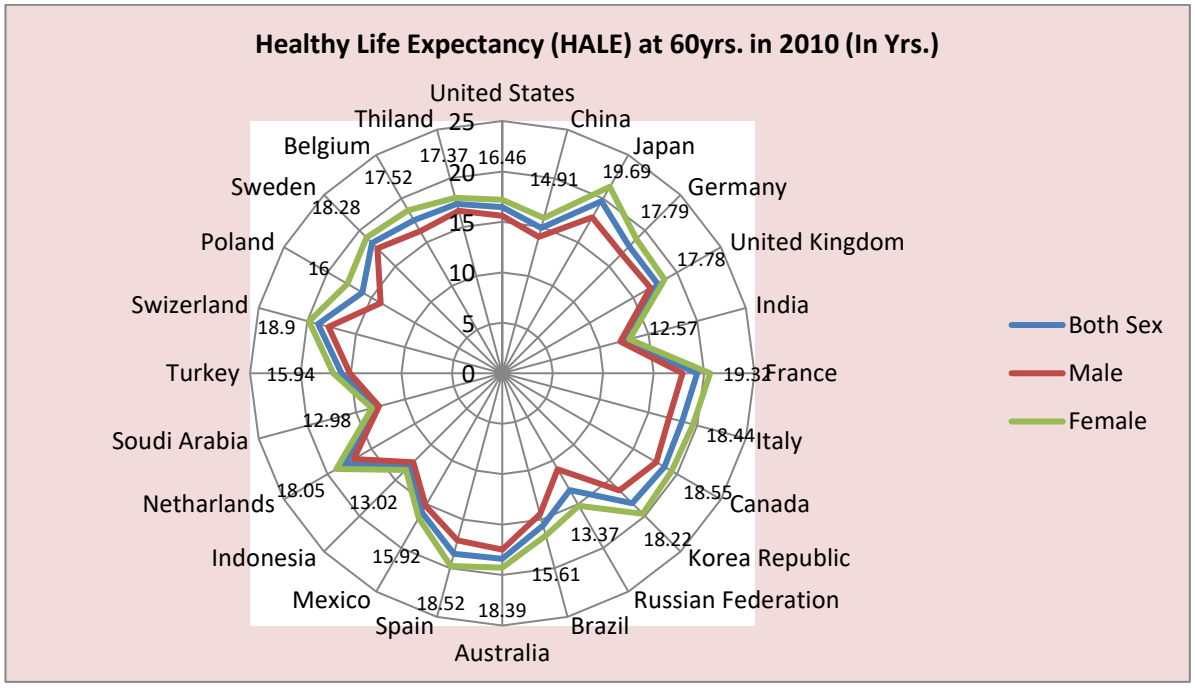


Figure 4.1.4.5

Healthy Life Expectancy (HALE) at 60 Yrs. In 2015 (in Yrs.)

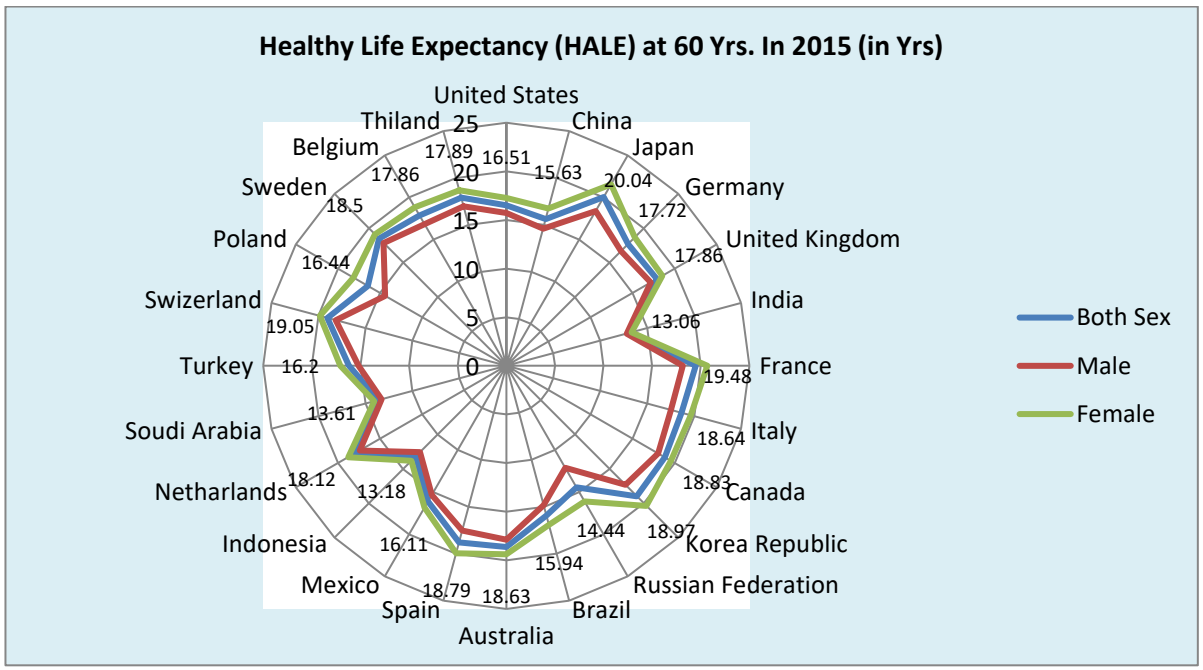


TABLE 4.1.4.6

Healthy Life Expectancy (HALE) at 60 Yrs. in 2019, (Highest to Lowest Value)

SL No.	Countries	Both Sex		Countries	Male		Countries	Female
1	Japan	20.39		Japan	18.82		Japan	21.85
2	Korea Republic	19.81		Switzerland	18.82		Korea Republic	21.2
3	France	19.7		France	18.48		France	20.82
4	Switzerland	19.52		Sweden	18.33		Spain	20.33
5	Spain	19.2		Australia	18.25		Switzerland	20.18
6	Canada	18.99		Canada	18.21		Germany	19.92
7	Australia	18.98		Korea Republic	18.21		Italy	19.84
8	Italy	18.91		Spain	17.98		Canada	19.72
9	Sweden	18.86		Netherlands	17.92		Australia	19.71
10	Germany	18.47		Italy	17.88		Sweden	19.37
11	Netherlands	18.44		United Kingdom	17.62		Belgium	19.11
12	United Kingdom	18.25		Belgium	17.17		Netherlands	18.94
13	Belgium	18.17		Thailand	16.99		United Kingdom	18.85
14	Thailand	17.96		Germany	16.95		Thailand	18.8
15	Poland	16.84		Turkey	15.79		Poland	18.52
16	Turkey	16.6		United States	15.59		Brazil	17.39
17	United States	16.35		Mexico	15.26		Turkey	17.31
18	Brazil	16.35		Brazil	15.18		United States	17.06
19	Mexico	16.07		China	14.99		China	16.93
20	China	15.92		Poland	14.86		Mexico	16.8
21	Russian Federation	15.03		Saudi Arabia	13.8		Russian Federation	16.66
22	Saudi Arabia	14.04		India	13.02		Saudi Arabia	14.38
23	Indonesia	13.35		Russian Federation	12.77		Indonesia	14.04
24	India	13.25		Indonesia	12.66		India	13.47
Data interpreted from data of WHO Global Health Observatory, last updated 04.12.2020								

Figure 4.1.4.6

Healthy Life Expectancy (HALE) at 60 Yrs. in 2019 (Yrs.)

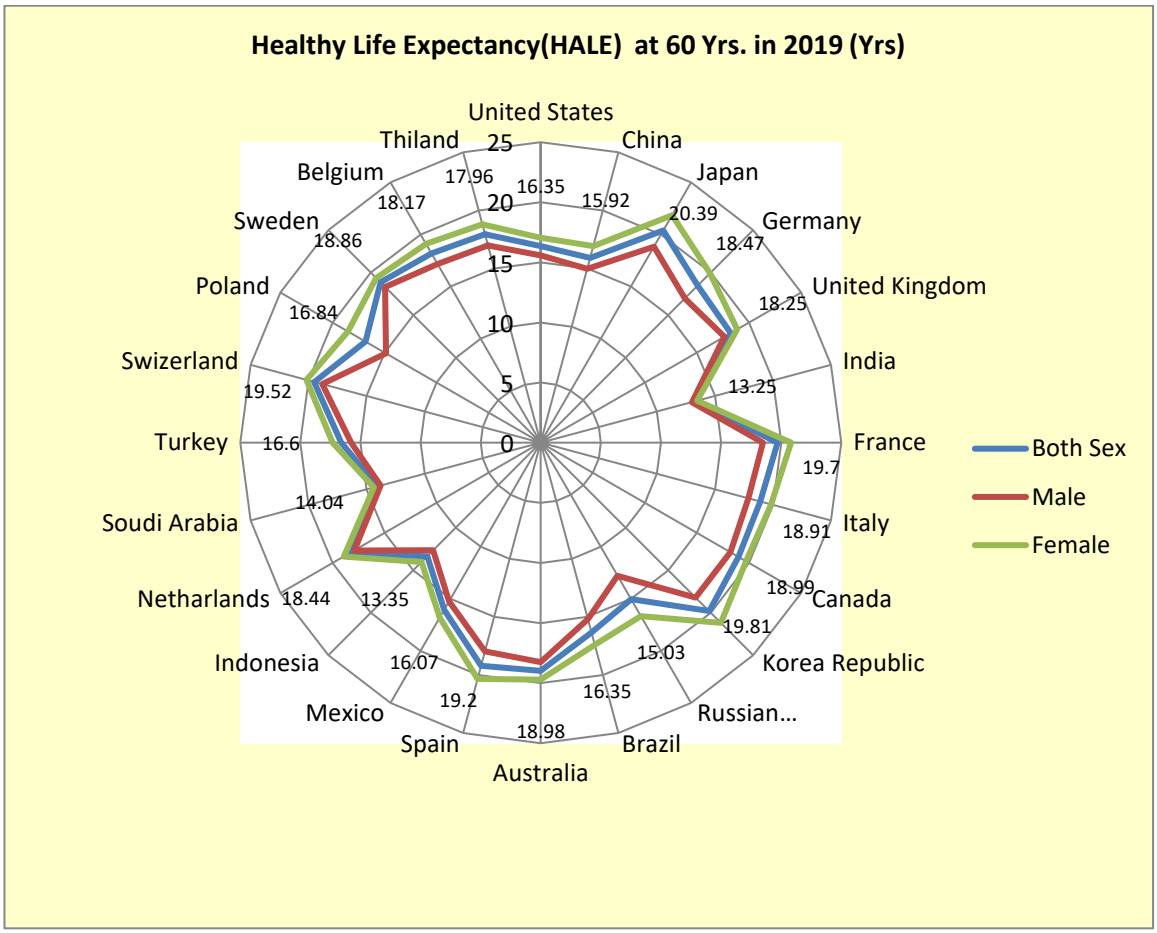


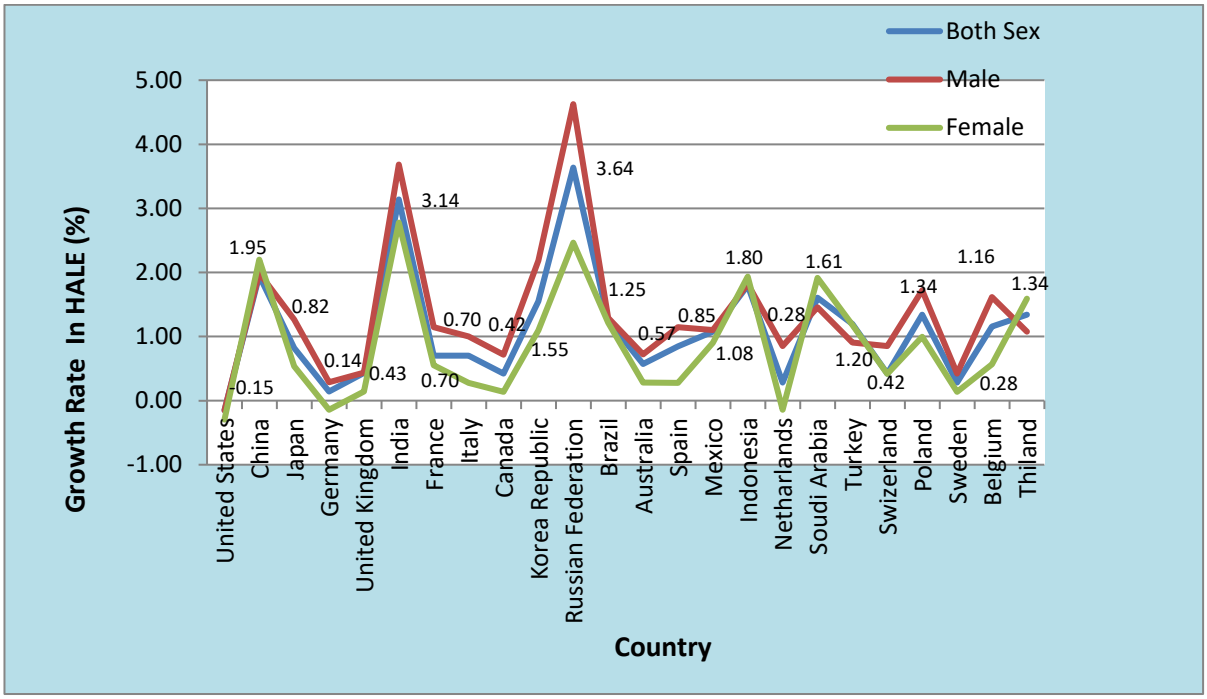
Table 4.1.4.7

Growth Rate in HALE at Birth between 2010 and 2015 (Highest to Lowest Value) in (%)

SL. No.	Countries	Both Sex		Countries	Male		Countries	Female
1	**Russian Federation**	3.64		**Russian Federation**	4.63		**India**	2.78
2	**India**	3.14		**India**	3.68		**Russian Federation**	2.47
3	**China**	1.95		**Korea Republic**	2.18		**China**	2.20
4	**Indonesia**	1.80		**China**	1.99		**Indonesia**	1.94
5	**Saudi Arabia**	1.61		**Indonesia**	1.82		**Saudi Arabia**	1.92
6	**Korea Republic**	1.55		**Poland**	1.72		**Thailand**	1.59
7	**Poland**	1.34		**Belgium**	1.62		**Brazil**	1.21
8	**Thailand**	1.34		**Saudi Arabia**	1.45		**Turkey**	1.18
9	**Brazil**	1.25		**Brazil**	1.29		**Korea Republic**	1.10
10	**Turkey**	1.20		**Japan**	1.27		**Poland**	1.00
11	**Belgium**	1.16		**France**	1.15		**Mexico**	0.90
12	**Mexico**	1.08		**Spain**	1.15		**Belgium**	0.57
13	**Spain**	0.85		**Mexico**	1.10		**France**	0.55
14	**Japan**	0.82		**Thailand**	1.08		**Japan**	0.54
15	**Italy**	0.70		**Italy**	1.00		**Switzerland**	0.42
16	**France**	0.70		**Turkey**	0.90		**Australia**	0.28
17	**Australia**	0.57		**Netherlands**	0.85		**Italy**	0.28
18	**United Kingdom**	0.43		**Switzerland**	0.85		**Spain**	0.28
19	**Canada**	0.42		**Australia**	0.72		**United Kingdom**	0.14
20	**Switzerland**	0.42		**Canada**	0.72		**Canada**	0.14
21	**Netherlands**	0.28		**United Kingdom**	0.44		**Sweden**	0.14
22	**Sweden**	0.28		**Sweden**	0.42		**Netherlands**	-0.14
23	**Germany**	0.14		**Germany**	0.29		**Germany**	-0.14
24	**United States**	-0.15		**United States**	-0.15		**United States**	-0.30
Data interpreted from data of WHO Global Health Observatory, last updated 04.12.2020								

Figure 4.1.4.7

Growth Rate in HALE at Birth between the year 2010 and 2015, (%)



In case of Healthy life Expectancy at 60 yrs. Japan ranks as highest country in 2010 for both sex and for Female having values 19.69 and 21.34 respectively and in 2015 for Both sex (20.04), for Male (18.39) and for Female 21.54 and in 2019 for Both sex (20.39), for male (18.82) for and female (21.85) among all the selected countries. Female has higher healthy life expectancy at birth and at 60yrs than that of male for all selected countries in 2010, 2015 and 2019.

India stands for the lowest country among all the selected countries in healthy life expectancy at 60 yrs. for both sex and for female in 2010, 2015 and also in 2019 having values 12.57 (Both sex) and 13.03 (Male) in 2010, 13.06(Both sex) and 13.32 (Male) in 2015 and 13.25 (Both sex) and 13.47 (Male) in 2019. Russian Federation holds the Lowest position in HALE at 60 yrs. for male in 2010 and 2015 having values 10.98 and 12.11 respectively but Indonesia holds the lowest position for male in 2019 having values 12.66 (Table 4.1.4.4, -4.1.4.6) (Figure 4.1.4.4-4.1.4.6).

Increasing tendency in healthy life expectancy at birth between the year 2010 and 2015, is found in most of the all selected countries except United States for all categories (for both sex, for male and for female), Germany for female category and Netherland for female category. Maximum increasing % in HALE between the year 2010 and 2015 at Birth is observed in Russian Federation for both sex (3.64) and for male(4.63) and in India for female category (2.78) (Table-4.1.4.7), (Figure-4.1.4.7).

India ranks as the 2nd highest country in Growth rate of HALE at birth for both sex and for male having values 3.14 and 3.68 between 2010 and 2015 but Russian Federation stands for 2nd highest country in female category (Table 4.1.4.7) (Figure 4.1.4.7).

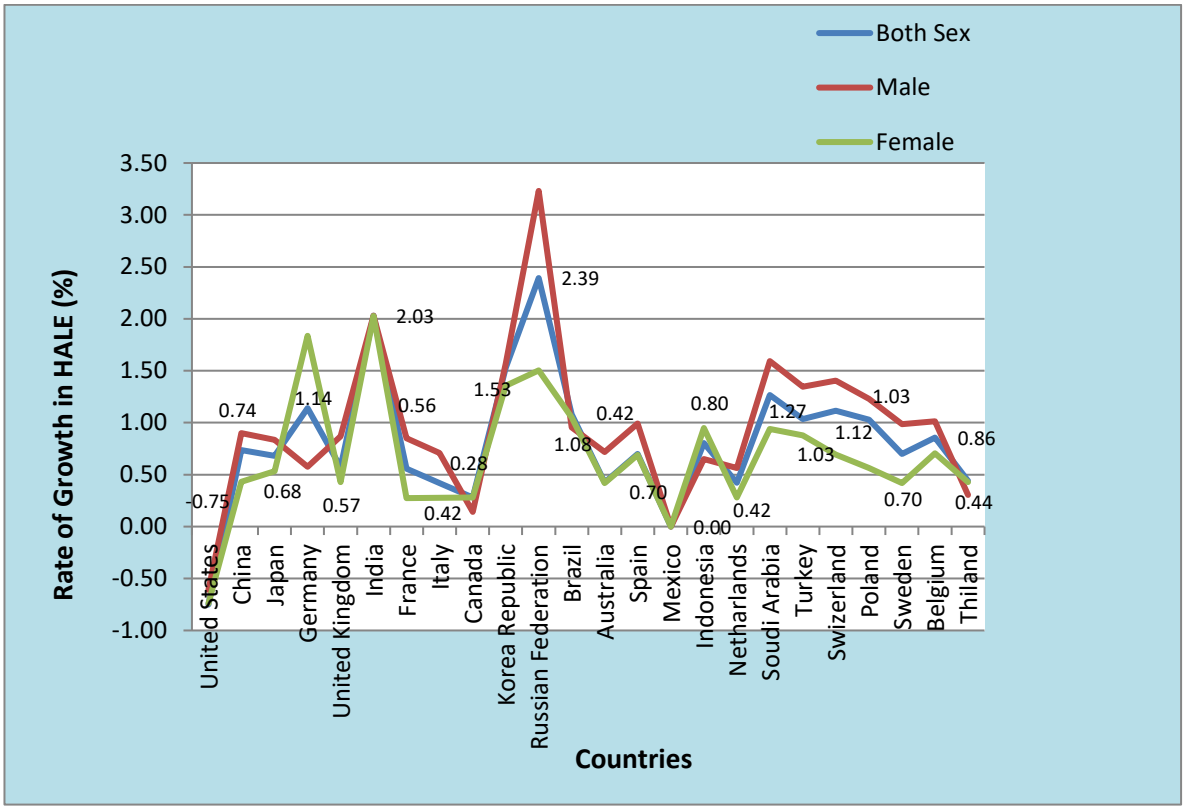
Table 4.1.4.8

Growth Rate in HALE at Birth between 2015 and 2019 (Highest to Lowest Value),(%)

SL No.	Countries	Both Sex		Countries	Male		Countries	Female
1	**Russian Federation**	2.39		**Russian Federation**	3.23		**India**	2.03
2	**India**	2.03		**India**	2.03		**Germany**	1.84
3	**Korea Republic**	1.53		**Saudi Arabia**	1.59		**Russian Federation**	1.50
4	**Saudi Arabia**	1.27		**Korea Republic**	1.57		**Korea Republic**	1.36
5	**Germany**	1.14		**Switzerland**	1.40		**Brazil**	1.05
6	**Switzerland**	1.12		**Turkey**	1.35		**Indonesia**	0.95
7	**Brazil**	1.08		**Poland**	1.23		**Saudi Arabia**	0.94
8	**Turkey**	1.03		**Belgium**	1.01		**Turkey**	0.88
9	**Poland**	1.03		**Spain**	0.99		**Belgium**	0.71
10	**Belgium**	0.86		**Sweden**	0.99		**Switzerland**	0.69
11	**Indonesia**	0.80		**Brazil**	0.96		**Spain**	0.69
12	**China**	0.74		**China**	0.90		**Poland**	0.56
13	**Sweden**	0.70		**United Kingdom**	0.87		**Japan**	0.53
14	**Spain**	0.70		**France**	0.85		**China**	0.43
15	**Japan**	0.68		**Japan**	0.83		**United Kingdom**	0.43
16	**United Kingdom**	0.57		**Australia**	0.72		**Thailand**	0.43
17	**France**	0.56		**Italy**	0.71		**Australia**	0.42
18	**Thailand**	0.44		**Indonesia**	0.65		**Sweden**	0.42
19	**Australia**	0.42		**Germany**	0.58		**Netherlands**	0.28
20	**Netherlands**	0.42		**Netherlands**	0.56		**Canada**	0.28
21	**Italy**	0.42		**Thailand**	0.30		**Italy**	0.28
22	**Canada**	0.28		**Canada**	0.14		**France**	0.27
23	**Mexico**	0.00		**Mexico**	0.00		**Mexico**	0.00
24	**United States**	-0.75		**United States**	-0.61		**United States**	-0.74
Data interpreted from data of WHO Global Health Observatory, last updated 04.12.2020								

Figure 4.1.4.8

Growth Rate in HALE at Birth between the Year 2015 and 2019, (%)



Only decreasing tendency in HALE at birth between the year 2015 and the year 2019 is found in USA in all categories (both sex, Male and female.) Like increasing % of HALE between 2010 and 2015, Russian Federation ranks as the highest scoring country in increasing % of HALE between 2015 and 2019 for both sex (2.39) and for male (3.23) and India holds the highest position in increasing % of HALE for female (2.03) and the 2nd highest position for both sex (2.03) and for male (2.03) among all the selected countries. Germany holds the 2nd highest position in HALE at birth for female (1.84). No improvement is observed for Mexico in HALE at birth between 2015 and 2019 for all categories (both sex, Male and female) among the selected countries (Table-4.1.4.8 and Figure 4.1.4.8).

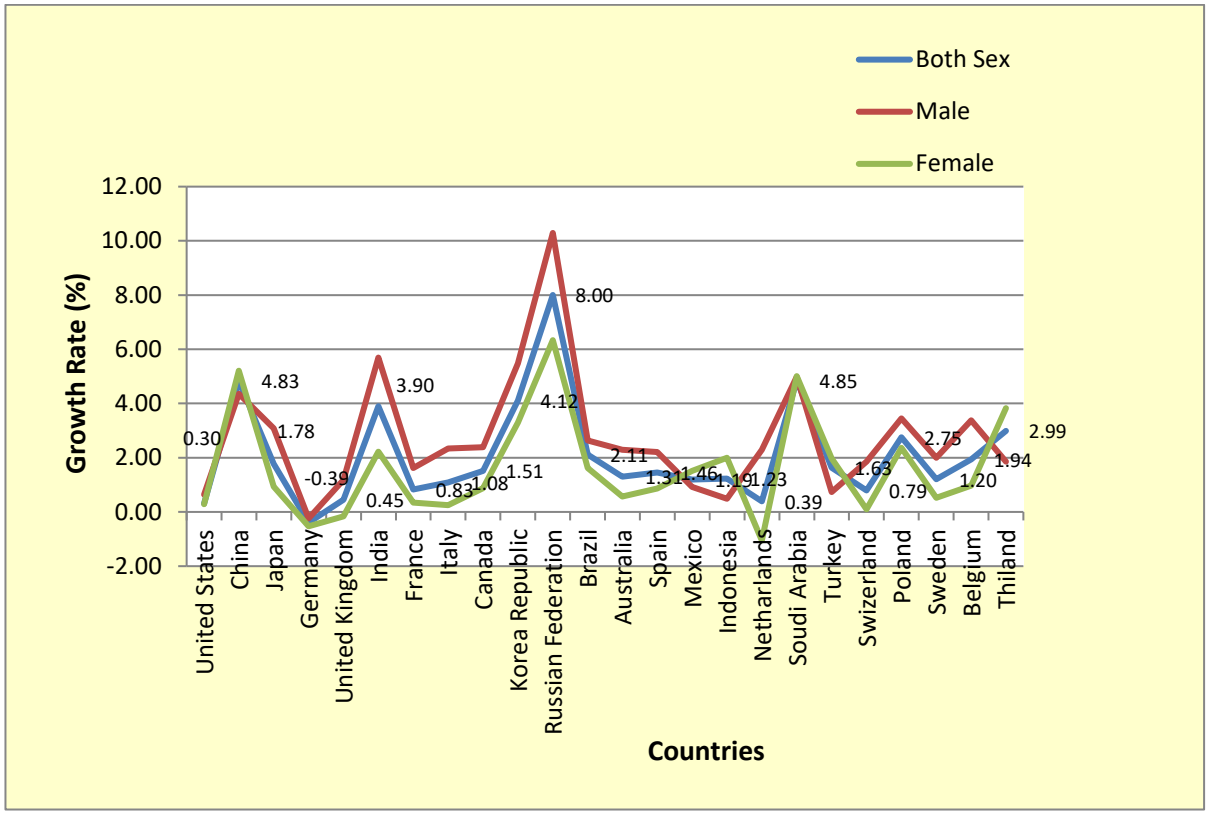
Table 4.1.4.9

Growth Rate of HALE at 60 Yrs. between 2010 and 2015 (Highest To Lowest Value) (%)

SL. No.	Countries	Both Sex		Countries	Male		Countries	Female
1	**Russian Federation**	8.00		**Russian Federation**	10.29		**Russian Federation**	6.34
2	**Saudi Arabia**	4.85		**India**	5.69		**China**	5.21
3	**China**	4.83		**Korea Republic**	5.48		**Saudi Arabia**	5.00
4	**Korea Republic**	4.12		**Saudi Arabia**	4.98		**Thailand**	3.83
5	**India**	3.90		**China**	4.36		**Korea Republic**	3.30
6	**Thailand**	2.99		**Poland**	3.45		**Poland**	2.37
7	**Poland**	2.75		**Belgium**	3.38		**India**	2.23
8	**Brazil**	2.11		**Japan**	3.08		**Indonesia**	2.00
9	**Belgium**	1.94		**Brazil**	2.63		**Turkey**	1.97
10	**Japan**	1.78		**Canada**	2.38		**Brazil**	1.62
11	**Turkey**	1.63		**Italy**	2.34		**Mexico**	1.51
12	**Canada**	1.51		**Netherlands**	2.29		**Belgium**	0.97
13	**Spain**	1.46		**Australia**	2.29		**Japan**	0.94
14	**Australia**	1.31		**Spain**	2.22		**Canada**	0.88
15	**Indonesia**	1.23		**Sweden**	2.00		**Spain**	0.86
16	**Sweden**	1.20		**Thailand**	1.86		**Australia**	0.57
17	**Mexico**	1.19		**Switzerland**	1.85		**Sweden**	0.53
18	**Italy**	1.08		**France**	1.62		**France**	0.34
19	**France**	0.83		**United Kingdom**	1.18		**United States**	0.29
20	**Switzerland**	0.79		**Mexico**	0.92		**Italy**	0.26
21	**United Kingdom**	0.45		**Turkey**	0.73		**Switzerland**	0.10
22	**Netherlands**	0.39		**United States**	0.64		**United Kingdom**	-0.16
23	**United States**	0.30		**Indonesia**	0.48		**Germany**	-0.53
24	**Germany**	-0.39		**Germany**	-0.24		**Netherlands**	-1.05
Data interpreted from data of WHO Global Health Observatory, last updated 04.12.2020								

Figure 4.1.4.9

Growth Rate in HALE at 60 Yrs. between the Year 2010 and 2015, (%)



In case of Growth Rate of HALE at 60 yrs. between 2010 and 2015 Russian Federation holds the top most position having highest increasing % for all categories, both sex (8.00), Male(10.29) and Female (6.34) among all the selected countries. Saudi Arabia holds the 2nd highest position in both sex (4.85), India holds the 2nd highest position in male (5.69) and China holds the 2rd position for female (5.21). Negative Growth Rate in HALE at 60 yrs. are observed in Germany in all categories (Both sex, Male and female) and in Netherland and United Kingdom for female category (Table-4.1.4.9 and Figure 4.1.4.9).

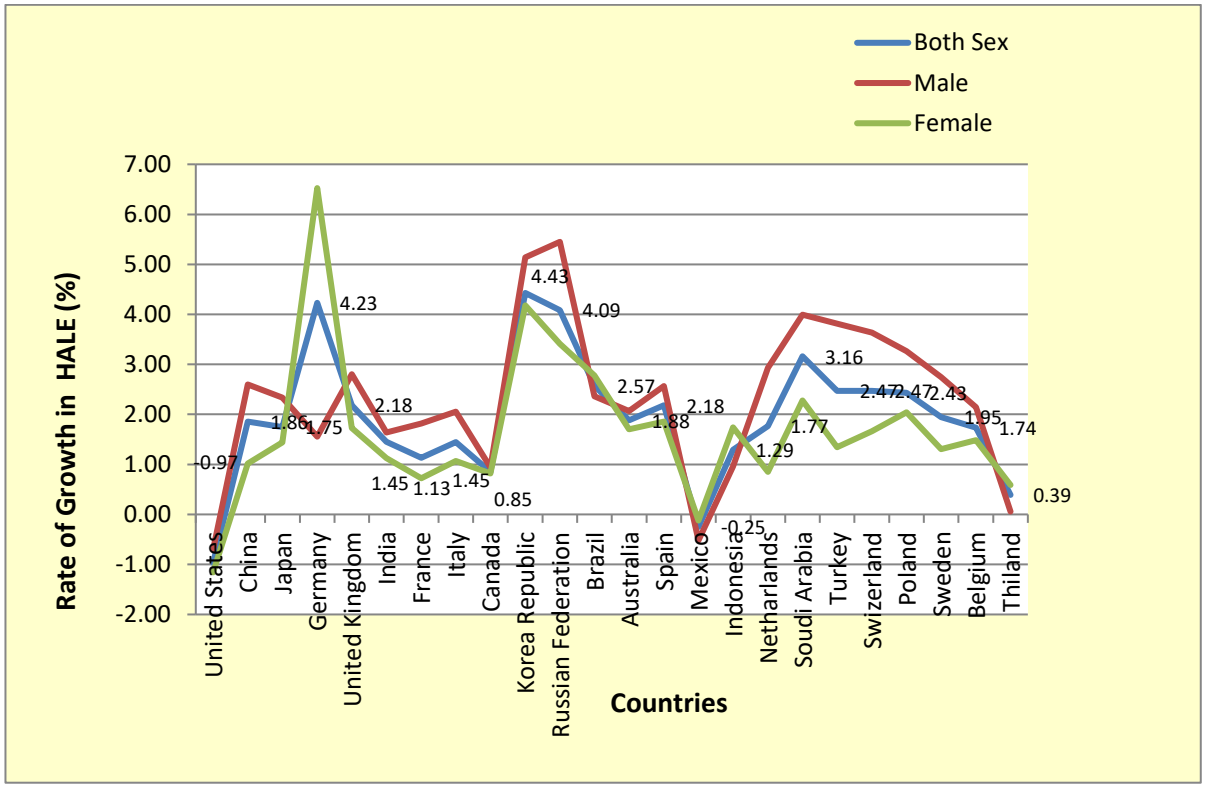
Table 4.1.4.10

Rate of Growth in HALE at 60 Yrs. between 2015 and 2019 (Highest to Lowest Value)

SL No.	Countries	Both Sex		Countries	Male		Countries	Female
1	**Korea Republic**	4.43		**Russian Federation**	5.45		**Germany**	6.52
2	**Germany**	4.23		**Korea Republic**	5.14		**Korea Republic**	4.18
3	**Russian Federation**	4.09		**Saudi Arabia**	3.99		**Russian Federation**	3.41
4	**Saudi Arabia**	3.16		**Turkey**	3.81		**Brazil**	2.78
5	**Brazil**	2.57		**Switzerland**	3.63		**Saudi Arabia**	2.28
6	**Turkey**	2.47		**Poland**	3.27		**Poland**	2.04
7	**Switzerland**	2.47		**Netherlands**	2.93		**Spain**	1.85
8	**Poland**	2.43		**United Kingdom**	2.80		**Indonesia**	1.74
9	**United Kingdom**	2.18		**Sweden**	2.75		**United Kingdom**	1.73
10	**Spain**	2.18		**China**	2.60		**Australia**	1.70
11	**Sweden**	1.95		**Spain**	2.57		**Switzerland**	1.66
12	**Australia**	1.88		**Brazil**	2.36		**Belgium**	1.49
13	**China**	1.86		**Japan**	2.34		**Japan**	1.44
14	**Netherlands**	1.77		**Belgium**	2.14		**Turkey**	1.35
15	**Japan**	1.75		**Australia**	2.07		**Sweden**	1.31
16	**Belgium**	1.74		**Italy**	2.05		**India**	1.13
17	**India**	1.45		**France**	1.82		**Italy**	1.07
18	**Italy**	1.45		**India**	1.64		**China**	1.01
19	**Indonesia**	1.29		**Germany**	1.56		**Netherlands**	0.85
20	**France**	1.13		**Indonesia**	0.96		**Canada**	0.82
21	**Canada**	0.85		**Canada**	0.94		**France**	0.73
22	**Thailand**	0.39		**Thailand**	0.06		**Thailand**	0.59
23	**Mexico**	-0.25		**Mexico**	-0.52		**Mexico**	-0.12
24	**United States**	-0.97		**United States**	-0.70		**United States**	-1.16
Data interpreted from data of WHO Global Health Observatory, last updated 04.12.2020								

Figure 4.1.4.10

Growth (%) in HALE at 60 Yrs. between the Year 2015 and 2019



Rate of Growth(% in HALE at 60yrs between 2015 and 2019 is observed highest in Korea Republic in both sex (4.43), highest in Russian Federation for Male (5.45) and highest in Germany for female (6.52). Negative Growth Rate in HALE at 60 yrs. are observed in United States and Mexico (Table 4.1.4.10, Figure 1.4.10).

Although India ranks as the lowest country in healthy life expectancy at birth in 2010 and 2015 for both sex and for female and in 2019 for all categories (both sex, for male and for female) it accelerates its progress having the highest Growth Rate in HALE at birth in female category and having 2nd highest % of Growth in HALE at birth for Both sex and for Male between 2010 and 2015 and between 2015 and 2019. In case of Rate of Growth in HALE at 60yrs, India holds the 2nd highest position for male category (5.69%) between 2010 and 2015, but between 2015 and 2019 increasing percentage is not satisfactory as India ranks as 17th for both sex among all the selected countries (Table 4.1.4.7 -4.1.4.10) (Figure 4.1.4.7-4.1.4.10).

Table 4.1.4.11

Correlation between Current Health Expenditure (% of GDP) and Healthy Life Expectancy at Birth(Yrs.) in 2019

Correlation between Current Health expenditure (%of GDP) and Healthy Life Expectancy at birth(yrs.) in 2019.			
Value of	Both Sex	Male	Female
r	0.5633	0.5851	0.5118
N	24	24	24
df	22	22	22
T Statistic	3.197	3.384	2.794
p value	0.0042	0.0027	0.0106

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Table 4.1.4.12

Correlation between Current Health Expenditure (% of GDP) and Healthy Life Expectancy at 60 (Yrs.) in 2019

Correlation between Current Health expenditure (%) of GDP and Healthy Life Expectancy at 60 (yrs.) in 2019.			
Value of	Both Sex	Male	Female
r	0.616	0.624	0.59
N	24	24	24
df	22	22	22
T Statistic	3.667	3.747	3.431
p value	0.0014	0.0011	0.0024

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Figure 4.1.4.11

Correlation between Current Health Expenditure (% of GDP) and HALE at Birth in 2019

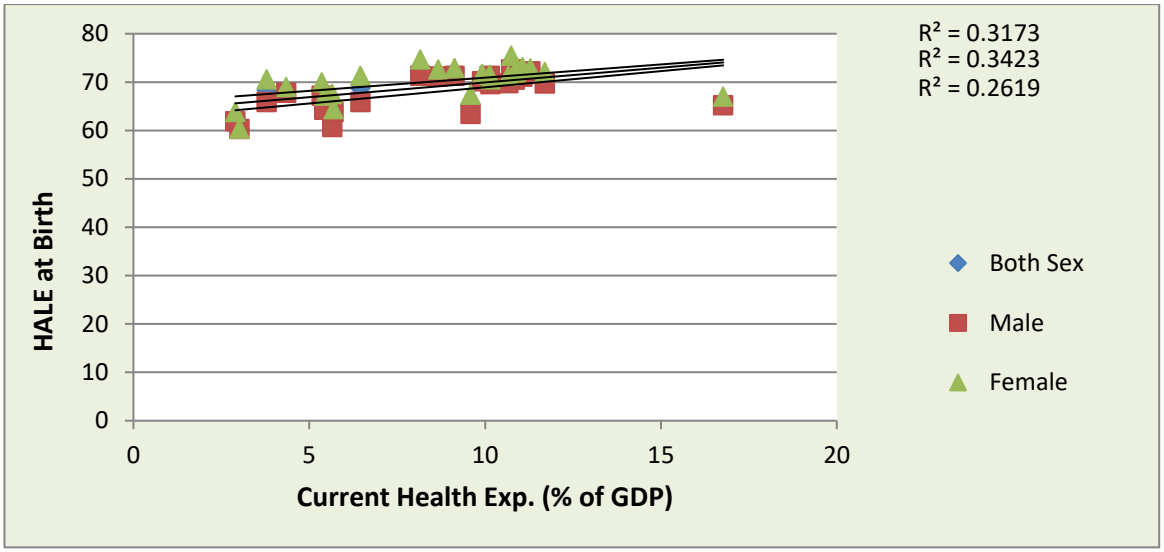


Figure 4.1.4.12

Correlation between Current Health Expenditure (% of GDP) and HALE at 60Yrs. in 2019

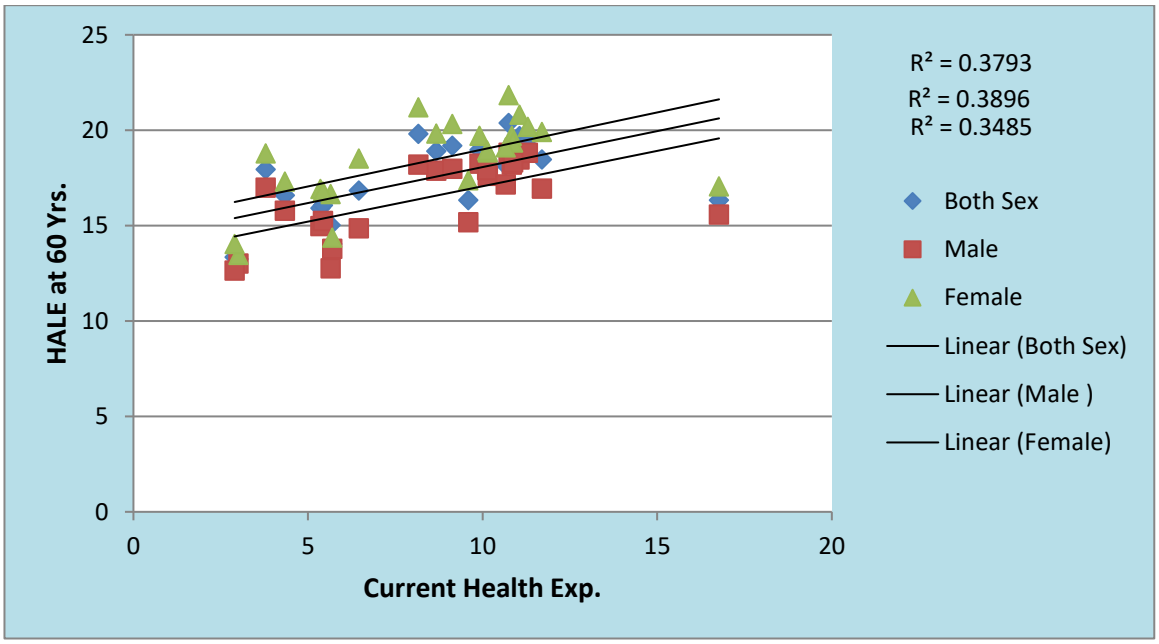


Table 4.1.4.13

Correlation between Domestic General Government Health Exp. (% of CHE.) and Healthy Life Expectancy at Birth In 2019

Correlation between Domestic General Government Health Exp. (% of current Health expenditure) and Healthy Life Expectancy at Birth in 2019.			
Value	Both Sex	Male	Female
r	0.5598	O.5297	0.5621
N	24	24	24
df.	22	22	22
T Statistic	3.17	2.99	3.19
p value	0.004	0.008	0.004

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.

Table 4.1.4.14

Correlation between Domestic General Government Health Exp.(% of CHE) and Healthy Life Expectancy at 60 Yrs. in 2019

Correlation between Domestic General Government Health Exp. (% of current Health expenditure) and Healthy Life Expectancy at 60 YRS in 2019.			
Value	Both Sex	Male	Female
r	0.499	0.464	0.509
N	24	24	24
df	22	22	22
T Statistic	2.71	2.46	2.78
p value	0.013	0.022	0.011

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom,*T Statistic= Test Statistic & *'p value' stands for probability value.

Figure 4.1.4.13

Correlation between Domestic General Government Health Expenditure (% of CHE) and HALE at Birth in 2019

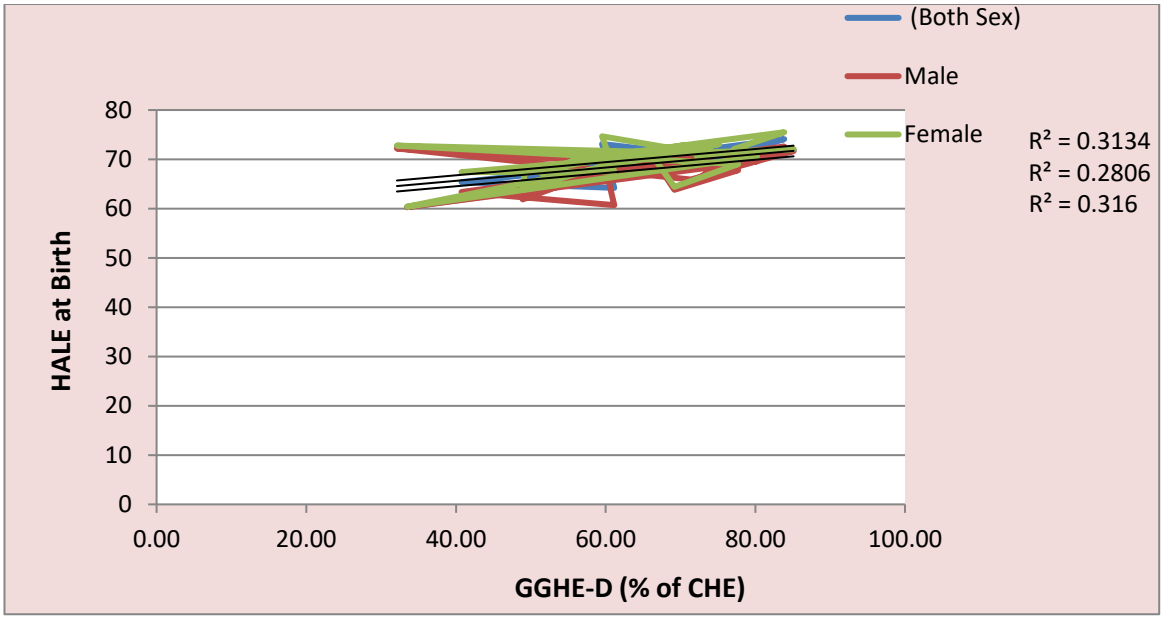


Figure 4.1.4.14

Correlation between Domestic General Government Health Expenditure(% of CHE) and HALE at 60 Yrs. in 2019

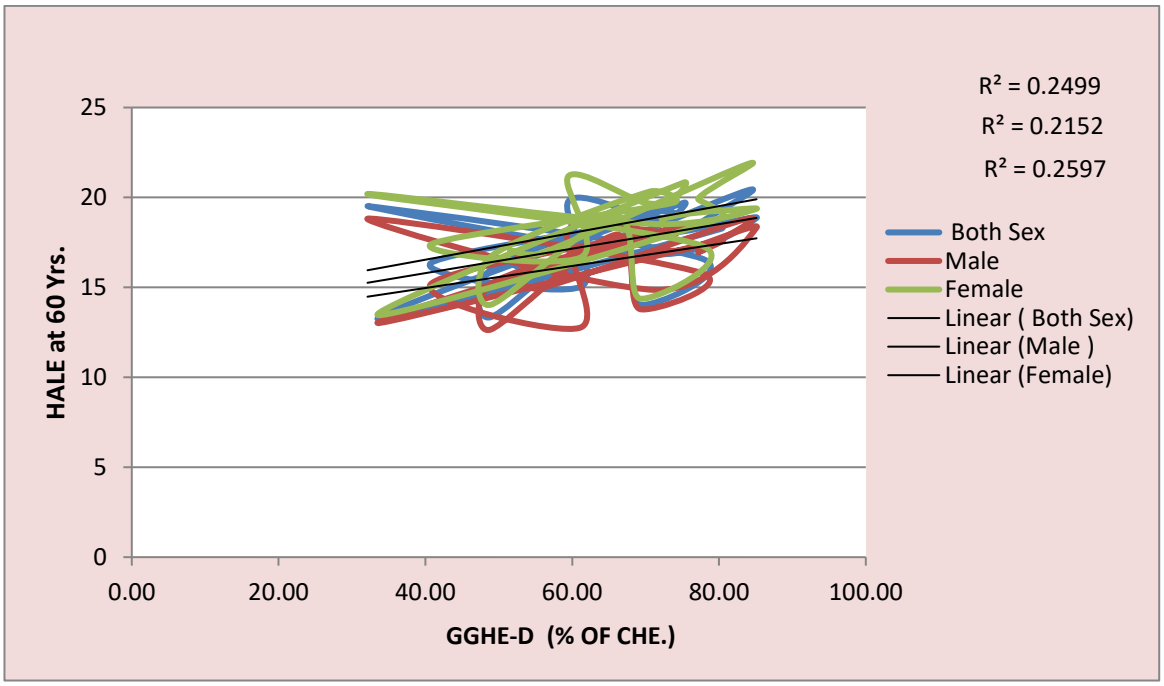


Table 4.1.4.15

Correlation between Out Of Pocket Expenditure and Healthy Life Expectancy at Birth in 2019

Correlation between Out of Pocket expenditure (% of current Health expenditure) and Healthy Life Expectancy at Birth in 2019.			
Value	Both Sex	Male	Female
r	-0.6009	-0.5939	-0.5797
N	24	24	24
df	22	22	22
T Statistic	3.527	3.462	3.337
p value	0.0019	0.0022	0.003

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom,
*T Statistic= Test Statistic & *'p value' stands for probability value.

Table 4.1.4.16

Correlation between Out Of Pocket Expenditure and Healthy Life Expectancy at 60 Yrs. in 2019

Correlation between Out of Pocket expenditure (% of current Health expenditure) and Healthy Life Expectancy at 60 YRS. in 2019.			
Value	Both Sex	Male	Female
r	-0.6021	-0.6148	-0.5752
N	24	24	24
df	22	22	22
T Statistic	3.537	3.657	3.298
p value	0.0019	0.0014	0.0033

*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom,
*T Statistic= Test Statistic & *'p value' stands for probability value.

Figure 4.1.4.15

Correlation between Out Of Pocket Expenditure (% CHE) and HALE at Birth in 2019

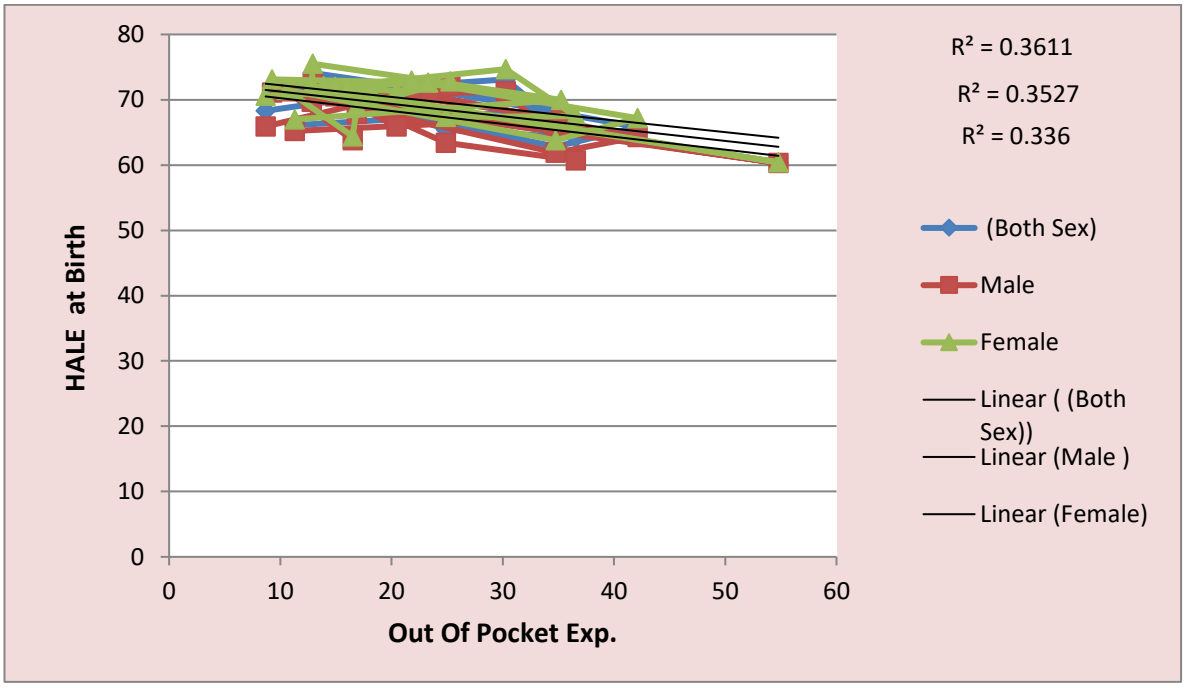
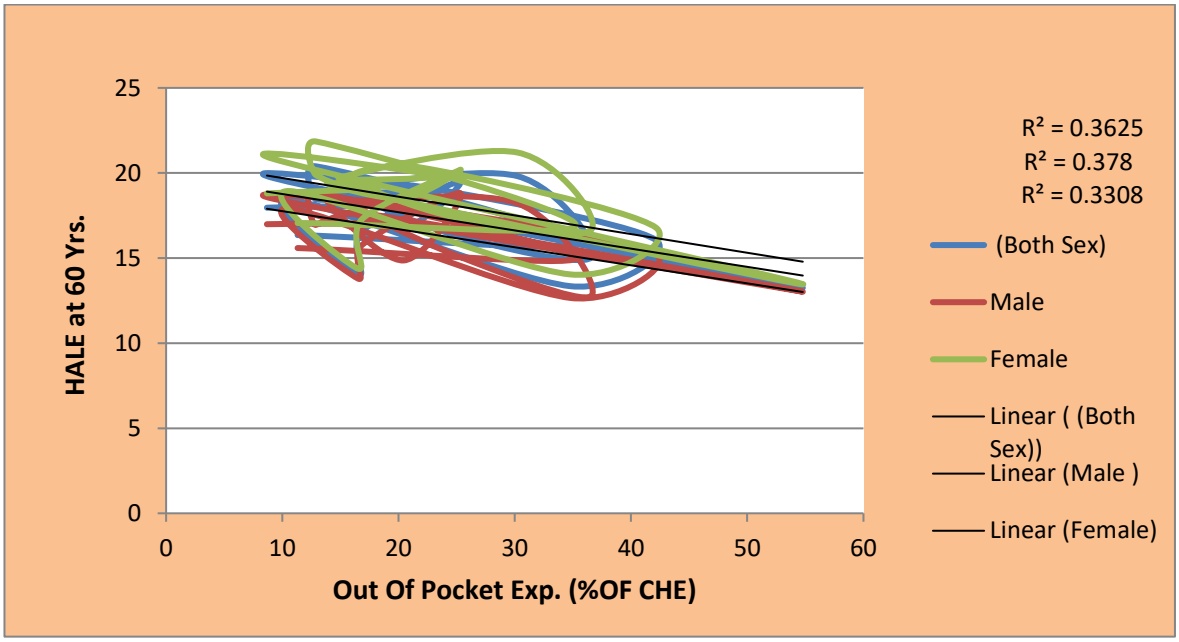


Figure 4.1.4.16

Correlation between Out Of Pocket Expenditure(%CHE) and HALE at 60yrs in 2019



It is found that the moderate positive correlation exists between current health expenditure(% of GDP) and Healthy Life Expectancy at birth and somewhat strong correlation exists between current health expenditure(% of GDP) and Healthy Life Expectancy at 60 yrs. (Table-4.1.4.11-4.1.4.12 & Figure-4.1.4.11-4.1.4.12).

Domestic General Government Health Expenditure(GGHE-D)(% of CHE) is moderately and positively correlated with Healthy Life Expectancy (HALE) at birth and at 60yrs in the year 2019 (Table-4.1.4.13-4.1.4.14) (Figure 4.1.4.13-4.1.4.14).

Negative correlation is observed between out of pocket expenditure and Healthy life expectancy at birth in 24 selected countries in 2019, having r(24)= -0.6009, P value =0.0019 for both sex, r(24)= -0.5939, p value = 0.0022 for male and r(24)= -0.5797, p value=0.003.(Table-4.1.4.15, Figure 4.1.4.15).

Negative correlation is also noticed between out of pocket expenditure and Healthy life expectancy at 60 yrs. in 24 selected countries in 2019, having r(24)=-0.6021, P value =0.0019 for both sex, r(24)=-0.06148, p value=0.0014 for male and r(24)= -0.05752, p value=0.0033. (Table 4.1.4.16)(Figure-4.1.4.16).

4.1.5 Stunting, Wasting, Under Weight And Over Weight Prevalence

4.1.5.1 Stunting:

Table 4.1.5.1.1

Stunting Prevalence Among Children Under 5 Yrs. Age (%)

Stunting Prevalence Among Children Under 5 Yrs. of Age (%),Last updated on 13-04-2021 BY WHO											
	YEAR										
COUNTRIES	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
United States	2.7	2.7	2.7	2.8	2.8	2.9	2.9	3.0	3.1	3.1	3.2
China	8.7	8.0	7.4	6.9	6.4	6.1	5.9	5.5	5.2	4.9	4.7
Japan	6.9	6.7	6.6	6.5	6.3	6.1	6.0	5.8	5.7	5.6	5.5
Germany	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6
United Kingdom											
India	44.5	43.1	41.7	40.3	38.9	37.5	36.2	34.8	33.5	32.1	30.9
France	-	-	-	-	-	-	-	-	-	-	-
Italy	-	-	-	-	-	-	-	-	-	-	-
Canada	-	-	-	-	-	-	-	-	-	-	-
Korea Republic	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Russian Federation	-	-	-	-	-	-	-	-	-	-	-
Brazil	6.6	6.4	6.3	6.2	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Australia	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Spain	-	-	-	-	-	-	-	-	-	-	-
Mexico	13.5	13.1	12.7	12.6	12.5	12.4	12.4	12.5	12.4	12.2	12.1
Indonesia	35.7	35.1	34.5	33.8	33.3	32.9	32.5	32.3	32.2	32.0	31.8
Netherlands	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6
Saudi Arabia	6.2	5.8	5.5	5.2	4.9	4.7	4.5	4.4	4.2	4.1	3.9
Turkey	-	-	-	-	-	-	-	-	-	-	-
Switzerland	-	-	-	-	-	-	-	-	-	-	-
Poland	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Sweden	-	-	-	-	-	-	-	-	-	-	-
Belgium	2.8	2.7	2.7	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.3
Thailand	14.9	14.4	13.9	13.5	13.1	12.9	12.8	12.7	12.6	12.4	12.3

*(-) Data of UK, France, Italy, Canada, Russian Federation, Spain, Turkey, Switzerland and Sweden is not available. (last updated on 13-04-2021).

Data of stunting prevalence among children under 5 yrs. age of selected countries (Table-4.1.5.1.1) reveals that in the year 2010 highest % of stunting prevalence existed in India (44.5) and the 2nd and 3rd highest country were Indonesia and Thailand respectively sharing the scores 35.07 and 14.9. The least scoring countries in the year 2010 whose scoring % is below 3 were Germany(1.4), ,Netherlands(1.5), Australia(2), Korea Republic (2.3), Poland (2.4), United States (2.7) and Belgium (2.8). But in the year 2020 little increasing tendencies are found in case of United States, Germany,

Australia and Netherlands. India also possesses the highest Average annual stunting prevalence between year 2010-2020 having value 37.59 % (Table-4.1.5.1.1 and 4.1.5.1.2).

Table 4.1.5.1.2

Prevalence of Average Stunting, Avg. Annual Rate of Reduction and Projected values in 2025 and 2030, among Children under 5 years of Age

COUNTRIES	Average annual prevalence of stunting 2010 to 2020 (%)	Avg. Annual Rate of Reduction in stunting from 2010 to 2020 (%)	Prevalence of stunting in 2020 (%)	Projected stunting (%) in 2025 based on present Avg. Reduction rate.	Projected stunting by 2030 (%) based on present Avg. annual reduction rate.
India	37.59	3.58	30.9	25.75	21.46
Indonesia	33.28	1.15	31.8	30.01	28.33
Thailand	13.23	1.89	12.3	11.18	10.16
Mexico	12.58	1.08	12.1	11.46	10.85
China	6.34	5.96	5.5	4.05	2.54
Brazil	6.20	0.78	6.1	5.87	5.64
Japan	6.15	2.24	5.5	4.91	4.39
Saudi Arabia	4.85	4.52	3.9	3.09	2.46
United States	2.90	-1.73	3.2	3.49	3.8
Belgium	2.53	1.93	2.3	2.09	1.89
Poland	2.32	0.42	2.3	2.25	2.205
Korea Republic	2.22	0.43	2.2	2.15	2.11
Australia	2.08	-0.5	2.1	2.15	2.207
Netherlands	1.53	-0.67	1.6	1.65	1.71
Germany	1.51	-1.38	1.6	1.71	1.84

Table 4.1.5.1.3

Stunting Children Under 5 Yrs. (Height-for-age) in India as per NFHS,(%)

NFHS-3) (2005-06)	NFHS-4) (2015-16)	NFHS-5 (2019-21)		
TOTAL	TOTAL	URBAN	RURAL	TOTAL
48	38.4	30.1	37.3	35.5

From the year 2010 to 2020 maximum improvement is achieved by China decreasing its initial value (8.7, year 2010) to Final value (4.7, year 2020) with 5.96 average annual rate of reduction (%). Saudi Arabia and India have also achieved the higher rate of average annual reduction (4.52 and 3.58 respectively) from the year 2010 to 2020 but India's stunting prevalence among the children under 5 yrs. age is still very high (30.9% year 2020) just below the score of Indonesia (31.8, year 2020) within selected countries and as per available data (Table No. 4.1.5.1.2).

Report of NFHS-5 (2019-21), Ministry of Health and Family Welfare, Government of India, also reflects the higher percentage of stunting Children under 5 years in India as 35.5 (Urban 30.1 & Rural 37.1) which is much alarming. (Table No. 4.1.5.1.3).

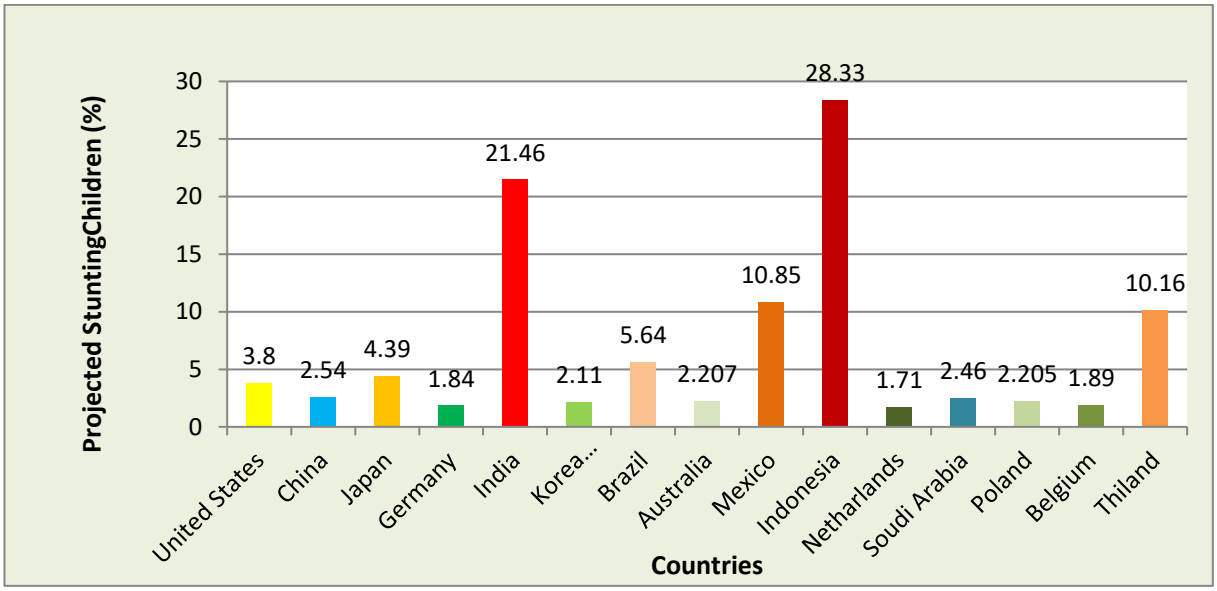
China has the highest (5.96%) AARR in prevalence of stunting under Yrs. of age Saudi Arabia come next having value 4.52%. India is the 3rd highest country to have AARR (%) in prevalence of stunting under 5 Yrs. age from 2010 to 2020 among all the selected countries having value 3.58 .

By 2025, the projected stunting prevalence will be highest in Indonesia and 2nd highest in India having values 30.1% and 25.75% respectively among all the selected countries.

By 2030, the projected values (based on the AARR) of prevalence of stunting children under 5 Yrs. will also be highest in Indonesia (28.33) and 2nd highest in India(21.46%) among all the selected countries(Table No. 4.1.5.1.2)(Figure-4.1.5.1.1).

Figure 4.1.5.1.1

Prevalence of Projected Stunting Children (%) Under 5yr By 2030 Based on Avg. Reduction



World Health Assembly (WHA , through resolution 65.6) adopted one of the Global targets which was to 40% reduction in the number of the stunting children under 5 Yrs. by 2025.

China will only hit the target i.e. 40% reduction of stunting by 2025, based on the Initial stunting prevalence in 2012 and average annual reduction(%). It is also observed that India and Saudi Arabia will be very close to the Global target by 2025) by its existing average annual reduction rate in stunting (Table 4.1.5.1.1 and 4.1.5.1.2).

Indonesia, India, Mexico and Thailand will be far behind to achieve Global Target by 2030 through achieving the SDG 2.2 (To end all forms of malnutrition). Based on the average annual decreasing percentage of stunting children under 5 yrs. age from 2010 to 2020 and the stunting values of the year 2020, the values of the prevalence of stunting children under 5yrs. age (%) of the said countries by 2030 will be 28.33 (Indonesia), 21.46 (India), 10.85 (Mexico) and 10.16 (Thailand) respectively. Netherlands, Germany, Belgium, Korea republic, Poland, Australia, Saudi Arabia and China will be very closed to Global target by 2030 regarding achieving the Sustainable Development Goal 2.2. (Figure No. 4.1.5.1.1).

With the existing Average Annual Rate of Reduction, India will not be able to achieve the Global target SDG 2.2 by 2030 (to be free from any kind of malnutrition) as India's stunting prevalence in 2020 remained very higher and by 2030 its projected prevalence will be 21.46%.

Table No 4.1.5.1.4

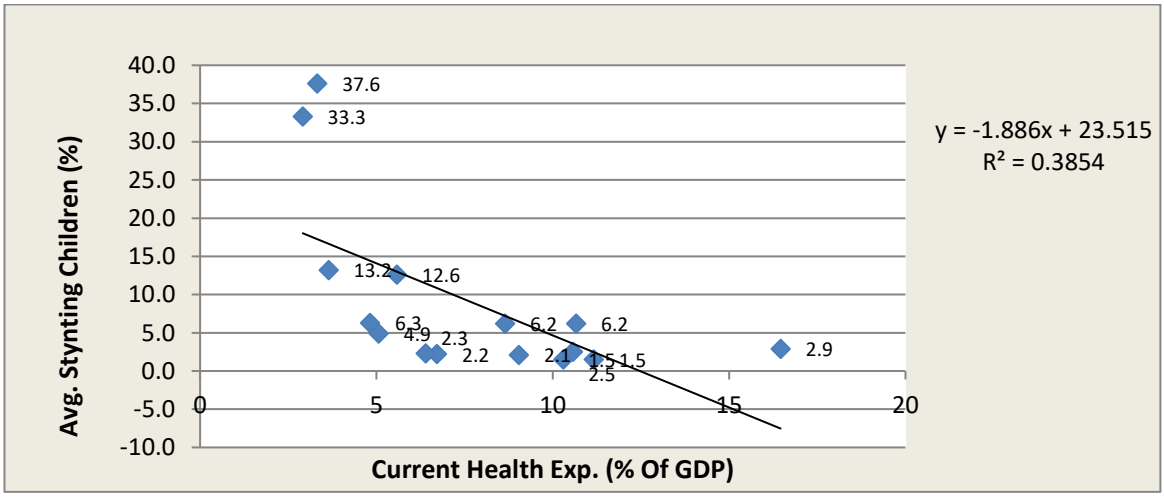
Correlation between Health Expenditure and Avg. Stunting Children Under 5 Yrs. Age(2010-2019)

Coefficient correlation between Health expenditure (% of GDP) and avg. stunting children under 5 yrs. age (2010-2019)	
	Value
r	-0.6208
N	15
df.	13
T Statistic	2.855
p value	0.0135

*r stands for Pearson Coefficient Correlation, N=Number of Observations, df =Degree of Freedom, T. Statistic=Test Statistic, p value=probability value.

Figure No. 4.1.5.1.2

Correlation between Avg. Current Health Expenditure (% of GDP) and Avg. Stunting Children Under 5 Years Age (%) (2010-2019)



Negative correlation is found between average current health expenditure and average percentage of stunting children under 5 yrs. age from 2010 to 2019. Pearson Correlation Coefficient (r)(15) = -0.62083, p value calculated as 0.013 which is less than α=0.05, (p= 0.013 ≤ 0.05), df=(N-2)=13 (Table No. 4.1.5.1.4 and Figure No. 4.1.5.1.2).

Table No 4.1.5.1.5

Correlation Between GGHE-D and Avg. Stunting Children Under 5 Yrs. Age (2010-2019)

Coefficient of correlation between Health expenditure (% of GDP) and avg. stunting children under 5 yrs. age (2010-2019)	
	Value
r	-0.72
N	15
df.	13
T Statistic	3.740
p value	0.0024

*r stands for Pearson Coefficient Correlation, N=Number of Observations, df =Degree of Freedom, T. Statistic=Test Statistic, p value=probability value.

Table No 4.1.5.1.6

Correlation Between OOPE and Avg. Stunting Children Under 5 Yrs. Age (2010-2019)

Coefficient of correlation between Health expenditure (% of GDP) and avg. stunting children under 5 yrs. age (2010-2019)	
	Value
r	0.808
N	15
df.	13
T Statistic	4.955
p value	0.0002

*r stands for Pearson Coefficient Correlation, N=Number of Observations, df =Degree of Freedom, T. Statistic=Test Statistic, p value=probability value.

Strong Negative correlation is found between average Domestic General Government health expenditure and average percentage of stunting children under 5 yrs. age from 2010 to 2019. Pearson Correlation Coefficient (r)(15) = -0.72, p value calculated as 0.0024 which is less than α=0.05, (p= 0.0024 $\leq$ 0.05), df=(N-2)=13 (Table No. 4.1.5.1.5).

Strong positive correlation is found between average Out Of Pocket Expenditure (% CHE) and average percentage of stunting children under 5 yrs. age from 2010 to 2019. Pearson Correlation Coefficient (r)(15) = 0.808, p value calculated as 0.0002 which is less than α=0.05, (p= 0.0002 $\leq$ 0.05), df=(N-2)=13 (Table No. 4.1.5.1.6).

4.1.5.2 Wasting:

Table 4.1.5.2.1

Wasting Prevalence Among Children Under 5 Yrs. Age, (%)

Countries	Wasting Prevalence Among Children Under 5 Yrs. Age, (%), Last updated on 17.04.2023										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
United States	0.1	-	0.3		0.3	-	0.4	-	0.1	-	-
China	2.3	-	-	1.9	-	-	-	1.9	-	-	-
Japan	2.3										
United Kingdom	-	-	-	0.1	-	0.3	-	0.3	-	-	-
Germany	-	-	-	-	-	-	0.4	-	-	-	-
India	-	-	-	-	15.1	20.8	-	17.3	-	-	18.7
Korea Republic		0.5			0.6			0.9			0.2
Mexico	-	-	1.6	-	-	1.0	2.0	-	-	1.4	1.6
Indonesia	12.3	-	-	13.5	-	-	-	-	10.2	-	-
Saudi Arabia	-	-	-	-	-	5.5	4.6	5.1	4.3	4.9	4.4
Turkey	-	-	-	1.9	-	-	-	-	1.7	-	-
Poland	-	0.7	-	-	-	-	-	-	-	-	-
Belgium	-	-	-	-	1.0	-	-	-	-	-	-
Thailand	-	-	6.7	-	-	-	5.4	-	-	7.7	-

(-) data is not available *Data of France, Italy, Canada, Russian Federation, Brazil, Australia, Spain, Netherlands, Switzerland and Sweden are not available.

Table 4.1.5.2.2

Wasting Children Under 5 Years (Weight-for-Height) (%)

NFHS-3) (2005-06)	NFHS-4) (2015-16)	NFHS 3 -4 Increasing (%)	NFHS-5 (2019-21)			NFHS 4-5, Reduction Rate (%)
Total	Total	Total	Urban	Rural	Total	Total
19.8	21	6.06	18.5	19.5	19.3	8.10

Source: National Family Health Survey -5, (2019-21), Ministry of Health and Family Welfare, Government Of India

As per report of wasting prevalence among children under 5 yrs. age by WHO, percentage of USA in 2018 is 0.1, China in 2017 is 1.9, Germany in 2016 is 0.3, India in 2020 is 18.7, Mexico in 2020 is 1.6, Indonesia in 2017 is 10.20, Turkey in 2018 is 1.7, Belgium in 2014 is 1 and Thailand in 2019 is 7.7. India's percentage of wasting prevalence is very alarming, in 2017 and 2020 percentage were very high(17.3 and 18.7 respectively). Indonesia's percentage in 2017 was the 2nd highest score among the said countries. Scenario of Thailand(7.7%) was also not satisfactory (Table No. 4.1.5.2.1).

Report of the National Family Health Survey, NFHS-3(2005-06), NFHS-4(2015-16) and NFHS-5(2019-21) shows the percentage of the Wasting Children under 5 Yrs. as 19.8, 21 and 19.3 (Urban 18.5 and Rural 19.5) respectively. Present prevalence of wasting children in India as per latest available data is 18.7 %(WHO, 2020) and is 19.30% (NFHS-5, 2091-21). Both values are much higher than all the other countries. National Family Health Surveys showed that from 2005-06 to 2015-16 the percentage of wasting increased by 6.06% and then decreased by 8.1% from 2015-16 to 2019-21(Table 4.1.5.2.2).

In 2012, the World Health Assembly (resolution 65.6) fix one of the Global targets for member countries to reduce and maintain childhood wasting to less than 5% by 2025 (WHO, 2014), but the present reduction rate will not enable India to achieve that Global target and also the SDG 2.2 by 2030.

4.1.5.3 Under Weight:

Table 4.1.5.3.1

Under Weight Prevalence among Children Under 5 Yrs. Age (%)

COUNTRIES	Under Weight Prevalence Among Children Under 5 Yrs. Age (%), Last updated on 20.07.2022 by WHO										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
United States	-	-	-	-	-	-	-	-	0.4	-	-
China	-	-	-	2.4	-	-	-	-	-	-	-
Japan	3.4	-	-	-	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	0.5	-	-	-	
India	-	-	-	-	29.4	36.3	-	33.4	-	-	-
Mexico	-	-	2.8	-	-	3.9	4.2	-	-	4.7	4.6
Indonesia	-	-	-	-	-	-	-	-	17.7	-	-
Turkey	-	-	-	2.3	-	-	-	-	1.5	-	-
Poland	-	0.7	-	-	-	-	-	-	-	-	-
Belgium	-	-	-	-	1.0	-	-	-	-	-	-
Thailand	-	-	9.2	-	-	-	6.7	-	-	7.7	-

(-) data is not available

Table 4.1.5.3.2

Underweight Children (Weight-for-Age) (%) Under 5 Yrs. in India

NFHS-3) (2005-06)	NFHS-4) (2015-16)	NFHS-5 (2019-21)			NFHS 4-5, Reduction Rate (%)
TOTAL	TOTAL	URBAN	RURAL	TOTAL	TOTAL
42.5	35.8	27.3	33.8	32.1	10.34

Data from very few countries are available sporadically regarding prevalence of underweight children under 5 yrs. of age among the selected countries. India's % of underweight children under 5 yrs. of age in 2014, 2015 and 2017 were 29.4, 36.3 and 33.4 respectively (Table No. 4.1.5.3.1).

AS per report of National Family Health Survey -5, (2019-21), Ministry of Health and Family Welfare, Government Of India, % of underweight children under 5 yrs. of age is 32.1 (Urban 27.30 and Rural 33.80) which is very much alarming . It is also observed that reduction rate of India's underweight prevalence from NFHS-4 (2015-16) to NFHS-5 (2019-21) is only 10.34 % (Table 4.1.5.3.2). By that trend of reduction rate India will not achieve the SDG 2.2 by 2030.

Table 4.1.5.3.3

Average Prevalence of Thinness in Children and Adolescent (5-19 Yrs.), from 2010-16 (BMI< -2sd)

SL. No.	COUNTRIES	Prevalence of Average annual thinness among children and adolescent 2010 to 2016 (Highest to Lowest values)(%)						
		Both Sex			Male			Female
1	**India**	27.11		**India**	31.27		**India**	22.49
2	**Indonesia**	10.47		**Indonesia**	12.23		**Indonesia**	8.60
3	**Thailand**	8.01		**Thailand**	9.04		**Thailand**	6.94
4	**Saudi Arabia**	7.50		**Saudi Arabia**	8.79		**Saudi Arabia**	6.04
5	**Turkey**	4.87		**Turkey**	5.33		**Turkey**	4.39
6	**China**	3.74		**China**	4.00		**China**	3.50
7	**Brazil**	2.83		**Brazil**	3.17		**Brazil**	2.44
8	**Russian Federation**	2.33		**Russian Federation**	2.63		**Poland**	2.10
9	**Poland**	2.06		**Japan**	2.43		**Russian Federation**	2.00
10	**Japan**	1.86		**Poland**	2.03		**Mexico**	1.46
11	**Mexico**	1.56		**Sweden**	1.90		**Japan**	1.26
12	**Sweden**	1.36		**Mexico**	1.69		**Korea Republic**	1.20
13	**Korea Republic**	1.33		**Korea Republic**	1.43		**Germany**	0.80
14	**Germany**	1.10		**Germany**	1.41		**Sweden**	0.80
15	**Belgium**	0.94		**Belgium**	1.24		**Netherlands**	0.73
16	**Netherlands**	0.91		**Netherlands**	1.13		**Belgium**	0.60
17	**United States**	0.70		**United States**	1.00		**France**	0.50
18	**United Kingdom**	0.70		**United Kingdom**	1.00		**Italy**	0.43
19	**France**	0.60		**Australia**	0.90		**United States**	0.40
20	**Australia**	0.60		**France**	0.70		**United Kingdom**	0.40
21	**Spain**	0.60		**Spain**	0.70		**Australia**	0.40
22	**Italy**	0.53		**Canada**	0.64		**Spain**	0.40
23	**Canada**	0.50		**Italy**	0.63		**Canada**	0.37
24	**Switzerland**	0.41		**Switzerland**	0.54		**Switzerland**	0.27
Data computed from WHO, Global Health Observatory, Last updated 29.09.2017								

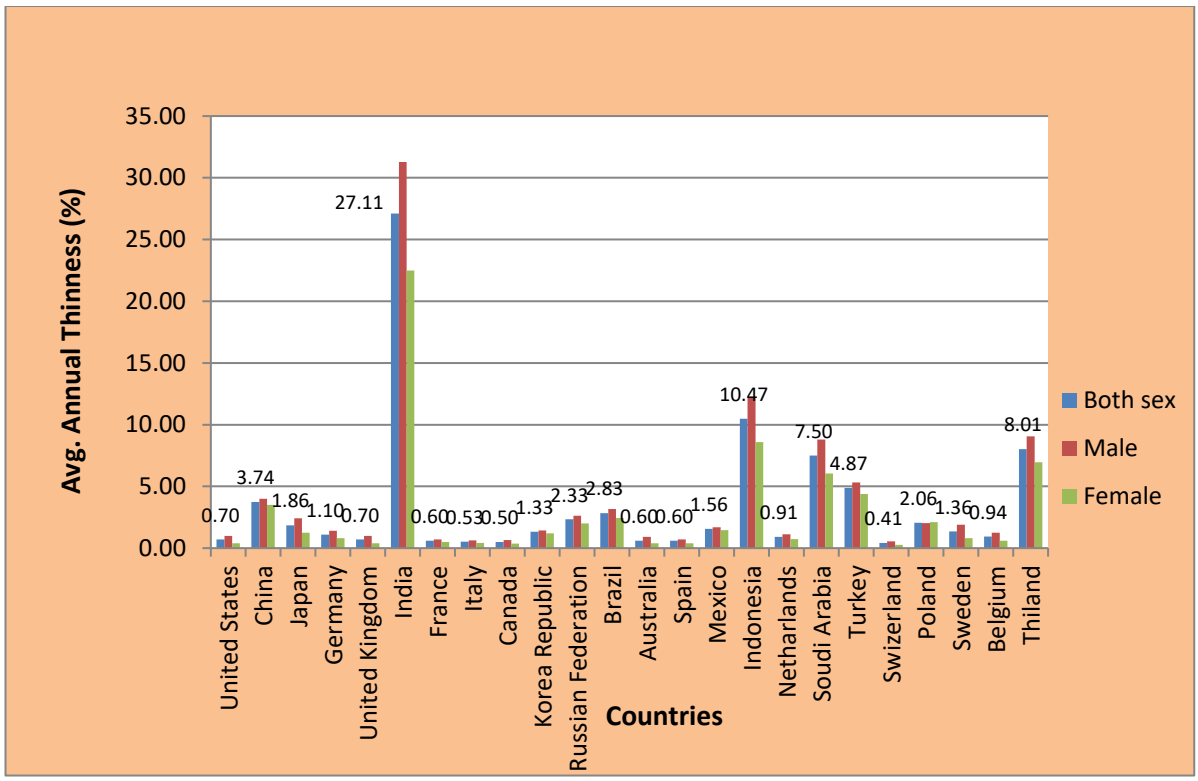
Table 4.1.5.3.4

AARR in Prevalence of Thinness Among Children and Adolescent (5-19 Yrs.), (%), 2010-2020

SL. No.	COUNTRIES	AARR in Thinness among children and adolescent from 2010 to 2016. (BMI< -2Sd) (Highest to Lowest value)						
		Both Sex			Male			Female
1	China	3.93		China	4.91		Switzerland	5.56
2	Switzerland	3.33		Switzerland	2.78		China	2.82
3	Brazil	1.73		Poland	2.38		Netherlands	2.08
4	Netherlands	1.67		Thailand	2.01		Brazil	2.00
5	Poland	1.55		Mexico	1.91		Mexico	1.11
6	Thailand	1.44		Brazil	1.56		Thailand	0.71
7	Korea Republic	1.19		Turkey	1.18		United States	0.00
8	Mexico	1.04		Korea Republic	1.11		Germany	0.00
9	Russian Federation	0.69		Indonesia	0.95		United Kingdom	0.00
10	Indonesia	0.63		Russian Federation	0.62		France	0.00
11	India	0.25		India	0.58		Korea Republic	0.00
12	United States	0.00		Saudi Arabia	0.38		Russian Federation	0.00
13	Germany	0.00		United States	0.00		Australia	0.00
14	United Kingdom	0.00		United Kingdom	0.00		Spain	0.00
15	France	0.00		France	0.00		Indonesia	0.00
16	Canada	0.00		Australia	0.00		Poland	0.00
17	Australia	0.00		Spain	0.00		Sweden	0.00
18	Spain	0.00		Germany	-1.19		Belgium	0.00
19	Turkey	-0.01		Netherlands	-1.52		India	-0.22
20	Saudi Arabia	-0.90		Sweden	-1.80		Turkey	-1.17
21	Sweden	-1.28		Japan	-2.09		Japan	-1.39
22	Belgium	-1.85		Italy	-2.78		Canada	-1.39
23	Japan	-2.78		Canada	-2.78		Saudi Arabia	-2.52
24	Italy	-3.33		Belgium	-4.19		Italy	-4.17
Data computed from WHO, Global Health Observatory, Last updated 29.09.2017								

Figure 4.1.5.3.1

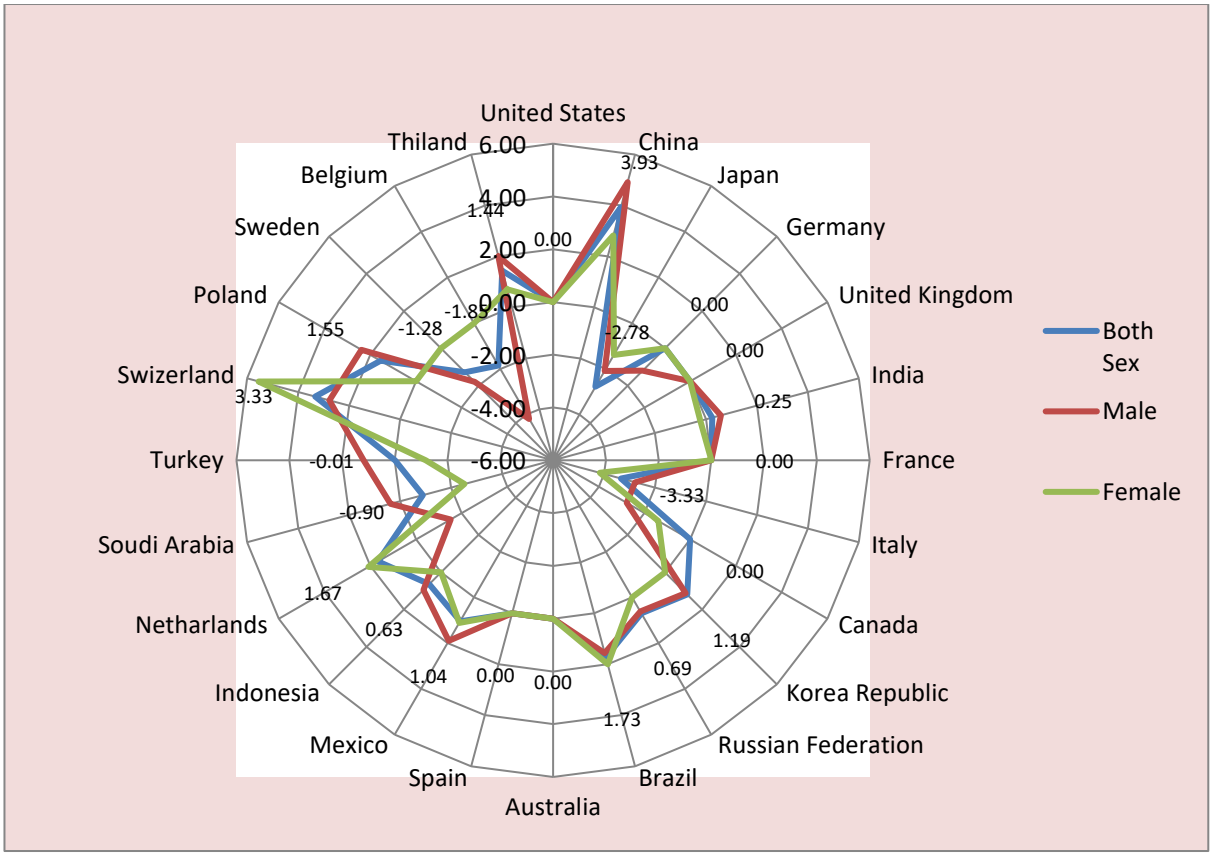
Average Annual Prevalence of Thinness Among Children & Adolescent (5-19 Yrs.), 2010-16 (BMI< -2SD) (%)



Average percentage of prevalence of thinness (BMI<-2sd) among children and adolescent (5-19 Yrs.) from the year 2010 to 2016 reflects that India possesses the highest values in case of Both sex, Male and Female (27.1, 31.27 and 22.49 respectively) among the 24 selected countries. Indonesia and Thailand stand for 2nd and 3rd highest positions having values 10.5(Both sex), 12.23(Male), 8.6 (Female) and 8.01 (Both Sex), 9.04 (Male) and 6.94 (Female) respectively. Least avg. percentages of thinness among children and adolescent are found in Switzerland, Canada, and Italy having values for both sex 0.41, 0.50 and 0.53 respectively. It is also observed that values of Male average percentage of thinness among children and adolescent (5-19 yrs.) from 2010-2016 in all countries except Poland are higher than that of the Female (Table 4.1.5.3.3)(Figure 4.1.5.3.1).

Figure 4.1.5.3.2

Average Annual Rate of Reduction of Prevalence of Thinness Among Children and Adolescent (5-19 Yrs.), (%), 2010-16, BMI< -2SD



Average Annual Rate Of Reduction In Prevalence Of Thinness Among Children And Adolescent(5-19 Yrs.) From 2010 To 2016 Are Not Satisfactory For India (Both Sex 0.25%, Male 0.58% And Female -0.22%), China's Value Of That For Both Sex And For Male Are Highest (3.93% And 4.91% Respectively), But Highest Average Annual Rate Of Reduction In **Female** Thinness Among Children And Adolescent (5-19yrs) Is Observed In Switzerland. Mild Negative Average Annual Rate Of Reduction In Prevalence Of Thinness Are Detected In Both Sex For Italy (-3.33%) Japan (-2.78%), Belgium(-1.85%), Sweden(-1.28%), Saudi Arabia (-0.9%) And Turkey (-0.01%), Although Annual Average Values Of That From 2010 To 2016 Are Much Lower In Case Of Both Sex For Italy(0.53%), Belgium(0.94%), Sweden (1.36%) And Japan(1.86%). (Table No. 4.1.5.3.4, Figure No. 4.1.5.3.2).

Table 4.1.5.3.5

Average Adult Under-Weight from 2010-2016 (BMI<18) 20yrs and Older, in (%)

SL. No.	Average (%) of underweight adult (BMI<18) from 2010 to 2016 (Highest to Lowest values)							
	COUNTRIES	**Both Sex**		**COUNTRIES**	**Male**		**COUNTRIES**	**Female**
1	**India**	24.73		**India**	24.30		**India**	25.24
2	**Indonesia**	13.93		**Indonesia**	14.31		**Indonesia**	13.51
3	**Thailand**	9.53		**Thailand**	10.16		**Japan**	9.64
4	**Japan**	6.90		**China**	4.80		**Thailand**	8.99
5	**China**	5.77		**Japan**	4.17		**China**	6.80
6	**Korea Republic**	4.49		**Korea Republic**	3.40		**Korea Republic**	5.67
7	**Brazil**	3.00		**Brazil**	2.26		**Brazil**	3.71
8	**Switzerland**	2.21		**Saudi Arabia**	1.96		**Switzerland**	3.63
9	**Saudi Arabia**	2.17		**Turkey**	1.29		**France**	3.17
10	**France**	1.87		**Russian Federation**	1.17		**Poland**	2.74
11	**Russian Federation**	1.84		**Mexico**	1.13		**Russian Federation**	2.50
12	**Poland**	1.77		**Poland**	0.81		**Saudi Arabia**	2.44
13	**Turkey**	1.54		**Switzerland**	0.77		**Sweden**	2.23
14	**Mexico**	1.50		**United Kingdom**	0.70		**Canada**	2.16
15	**Sweden**	1.39		**United States**	0.66		**Germany**	2.04
16	**Canada**	1.34		**France**	0.56		**Netherlands**	2.04
17	**United States**	1.33		**Sweden**	0.56		**Australia**	2.03
18	**Netherlands**	1.29		**Netherlands**	0.54		**United States**	1.99
19	**United Kingdom**	1.26		**Canada**	0.51		**Italy**	1.91
20	**Australia**	1.24		**Australia**	0.49		**Belgium**	1.90
21	**Germany**	1.21		**Italy**	0.44		**Mexico**	1.84
22	**Italy**	1.19		**Spain**	0.41		**Turkey**	1.84
23	**Belgium**	1.14		**Germany**	0.40		**United Kingdom**	1.81
24	**Spain**	1.00		**Belgium**	0.37		**Spain**	1.60
Data computed from WHO, Global Health Observatory, Last updated 22.09.2017								

Table 4.1.5.3.6

Average Annual Rate of Reduction of Underweight Adult (BMI<18)(2010-2016)(%)

SL. No.	AARR in underweight adult (BMI<18) from 2010 to 2016.(Highest to Lowest Value) (%)							
	COUNTRIES	**Both Sex**		**COUNTRIES**	**Male**		**COUNTRIES**	**Female**
1	Brazil	3.29		Turkey	4.97		Thailand	2.93
2	Thailand	3.27		United Kingdom	4.46		Mexico	2.64
3	Turkey	3.13		Mexico	4.19		Turkey	2.64
4	China	2.84		Belgium	4.17		Indonesia	2.31
5	Italy	2.67		China	4.10		Brazil	2.20
6	Indonesia	2.48		Poland	3.94		China	2.17
7	Netherlands	2.47		Brazil	3.64		United Kingdom	1.80
8	Sweden	2.30		Thailand	3.54		Poland	1.79
9	Saudi Arabia	2.28		Italy	3.33		Italy	1.71
10	Mexico	2.15		Australia	3.33		United States	1.63
11	Poland	1.80		Spain	3.33		Sweden	1.48
12	France	1.71		Saudi Arabia	3.26		India	1.38
13	India	1.54		Korea Republic	2.91		Russian Federation	1.31
14	Switzerland	1.48		Indonesia	2.87		France	1.03
15	Korea Republic	1.47		France	2.78		Switzerland	0.91
16	Belgium	1.39		Canada	2.78		Germany	0.79
17	Germany	1.28		Netherlands	2.78		Australia	0.79
18	United Kingdom	1.28		Sweden	2.78		Netherlands	0.79
19	Australia	1.28		Russian Federation	2.67		Canada	0.76
20	United States	1.19		United States	2.38		Saudi Arabia	0.67
21	Canada	1.19		Japan	2.35		Korea Republic	0.58
22	Russian Federation	0.88		Switzerland	2.08		Spain	0.00
23	Japan	0.48		India	1.63		Belgium	0.00
24	Spain	0.00		Germany	0.00		Japan	-0.17
Data computed from WHO, Global Health Observatory, Last updated 22.09.2017								

Figure 4.1.5.3.3

Average Annual Underweight Prevalence Among Adult, BMI < 18 (Age Standardised Estimate) 2010 to 2016 in (%)

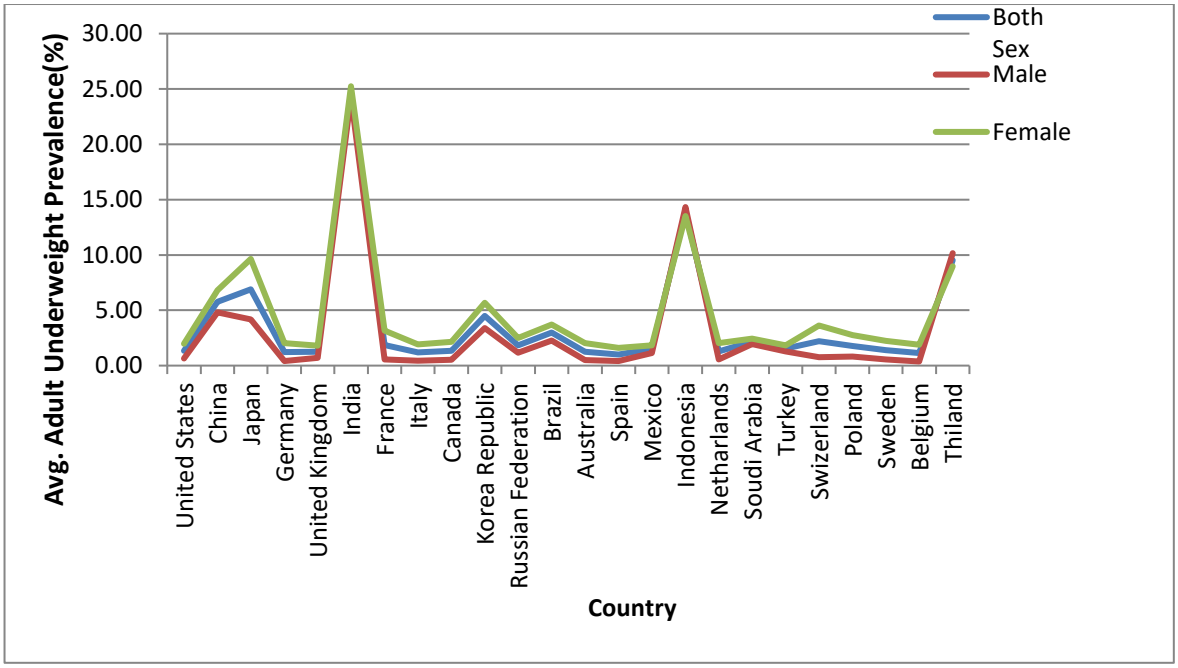
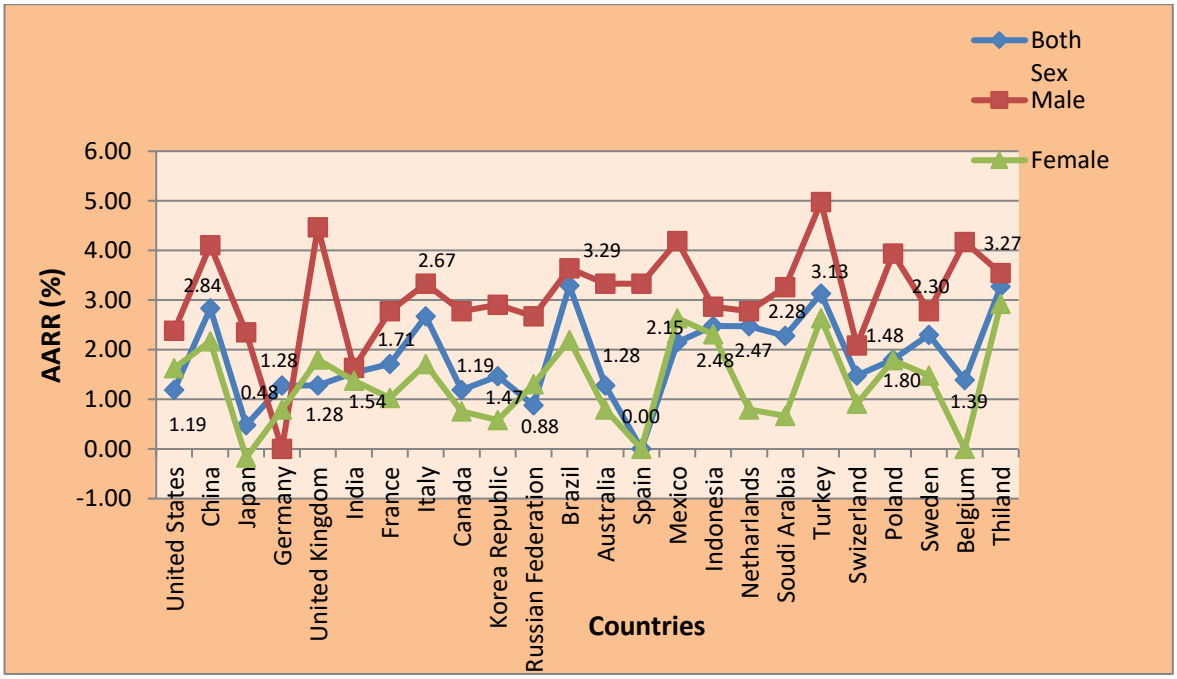


Figure 4.1.5.3.4

Average Annual Rate of Reduction in Under Weight Prevalence Among Adult, BMI< 18 (2010-2016), (%)



Like children and adolescent(5-19yrs) under-weight, Average percentage of under-weight prevalence among adult (20yrs and above) from 2010 to 2016 is also highest in India among selected countries(Figure No. 4.1.5.3.3, Table No. 4.1.5.3.5). Indonesia and Thailand stand for 2nd and 3rd highest scoring countries among all selected countries. Value of under-weight adult for India is 24.73(Both Sex), 24.30 (Male) and 25.24 (Female), for Indonesia it is 13.93(Both Sex), 14.31(Male) and 13.51(Female) and for Thailand it is 9.53(Both Sex), 10.16(Male) and 8.99 (Female.) Least scoring countries for both sex are Spain, , Belgium, Italy, Germany, Australia and United kingdom(Average values < 1.30). Countries having Least values of under-weight adult male are Belgium(0.37), Germany(0.40) and Spain (0.41) but Countries having Least values of under-weight adult female are Spain(1.60), United Kingdom(1.81), Mexico(1.84) and Turkey(1.84). It is noticed that the percentages of avg. under-weight prevalence for adult from 2010 to 2016 for Females in most of the countries are higher than that of Males, but for Indonesia and Thailand Male values are mild higher than that of Female.

Average annual rate of reduction of under-weight prevalence % among adult from 2010 to 2016, is highest in Brazil (Values 3.29) and are 2nd and 3rd highest in Thailand(3.27) and in Turkey (3.13). India's Value (1.54 for Both sex, 1.63 for male and 1.38 for Female) of reduction in average under-weight percentage among adult is not satisfactory and having lower than that of Indonesia (2.48 Both sex, 2.87 Male, 2.31 Female) and Thailand(3.27 Both sex, 3.54 Male and 2.93 Female).(Figure 4.1.5.3.4 .and Table 4.1.5.3.6).

National Family Health Survey in 2015-16 and 2019-21 in India also reflect the decreasing tendency in percentage of women (15-49yrs) having BMI<18.5 by 22.9 to 18.7 as a total (Urban and Rural) respectively and that of for men by 20.2 to 16.2.

Table No 4.1.5.3.7

Coefficient Correlation between Avg. Health Expenditure (%GDP) and Avg. Prevalence of Thinness (%) Among Child and Adolescent (5-19 Yrs.)

Coefficient Correlation between avg. Health expenditure (%) of GDP and avg. prevalence of thinness(%) among child & adolescent (5-19 yrs.) (BMI<-2sd)from 2010-2016.			
Value of	Both Sex	Male	Female
r	-0.5916	-0.5775	-0.6127
N	24	24	24
df	22	22	22
T. Statistic	3.442	3.318	3.636
p value	0.0023	0.0031	0.0014
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.			

Figure 4.1.5.3.5

Correlation between Average Health Expenditure (% of GDP) and Average Prevalence of Thinness (%) Among Child and Adolescent (5-19 Yrs.) from 2010-2016

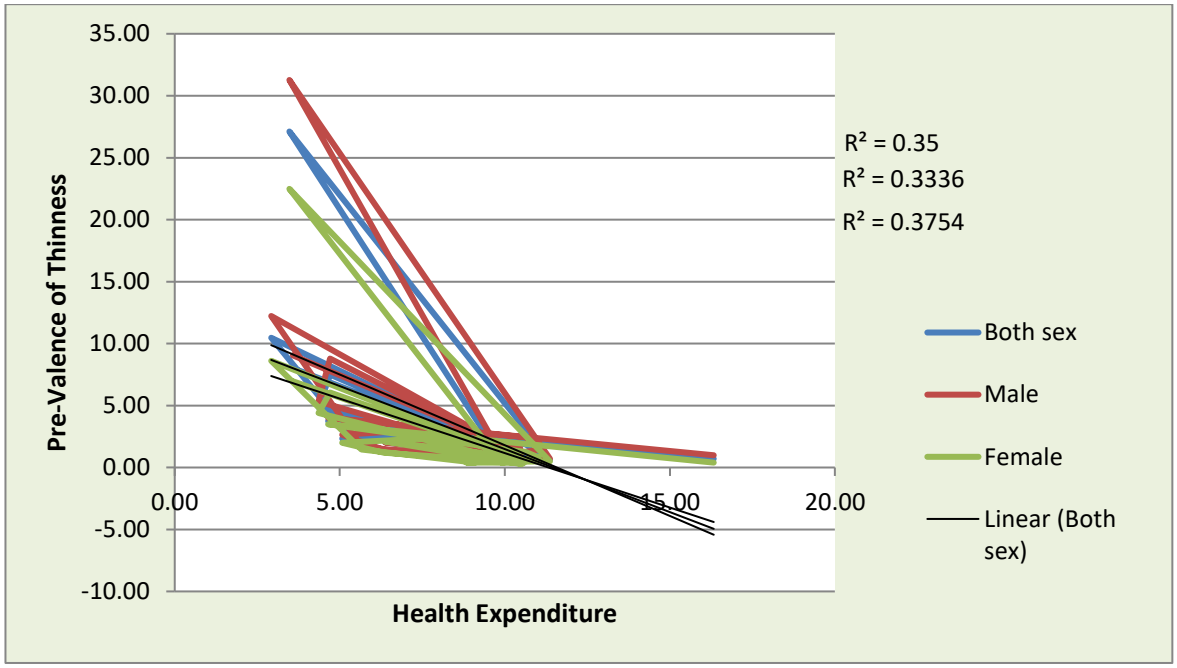


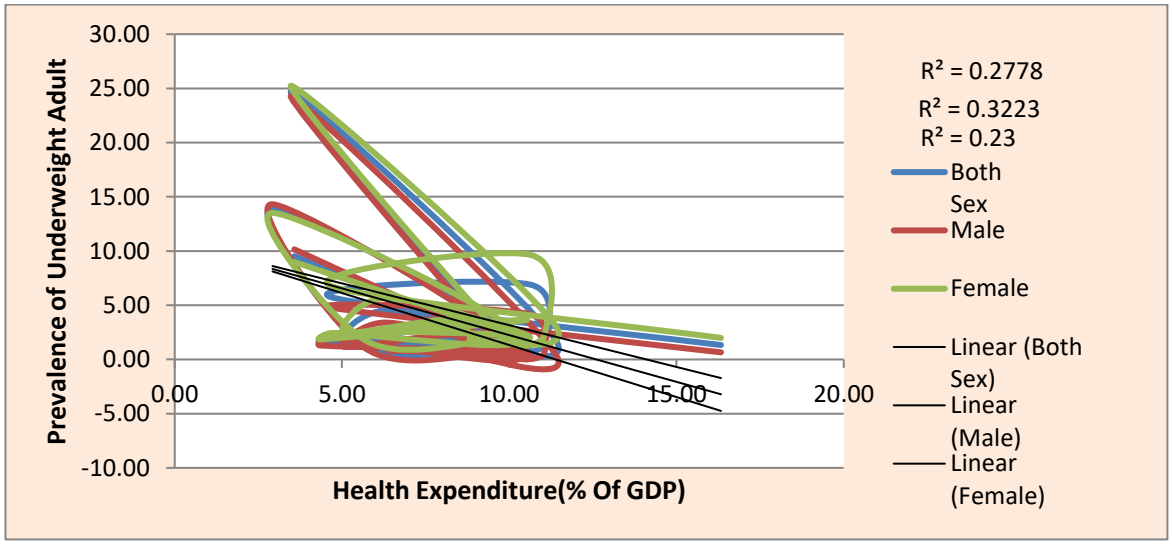
Table No 4.1.5.3.8

Correlation between Avg. Health Expenditure (% of GDP) and Avg. Prevalence of Under-Weight Adult (%) (20yrs and Old) (BMI<18) from 2010-2016

Coefficient Correlation between avg. Health expenditure (%) of GDP and avg. prevalence of under-weight adult (%) (20yrs & old) (BMI<18) from 2010-2016.			
Value	Both Sex	Male	Female
r	-0.5271	-0.5677	-0.4795
N	24	24	24
df	22	22	22
T Statistic	2.909	3.234	2.563
p value	0.0081	0.0038	0.0177
*r stands for Pearson Coefficient Correlation, *N= Number of observation, Df=Degree of Freedom,*T. Statistic= Test Statistic & *'p value' stands for probability value.			

Figure 4.1.5.3.6

Correlation between Average Health Expenditure (%of GDP) and Average Prevalence Of Under Weight Adult (20 Yrs. and Old) from 2010-2016



It is noticed that Average Health expenditure(%) of GDP and average prevalence of thinness (BMI< -2 standard deviation from median) among the children and adolescent (5-19yrs) from the year 2010-2016, are negatively correlated in case of both Sex, Male and Female separately (Table No. 4.1.5.3.7 and Figure No 4.1.5.3.5) and also negative correlation is observed between Average Health expenditure (% of GDP) and average prevalence of underweight adult(BMI<18) from the year 2010-2016 (Table 4.1.5.3.8 and Figure 4.1.5.3.6).

Table 4.1.5.3.9

Correlation between Avg. GGHE-D And Avg. Prevalence of Thinness(%) Among Child and Adolescent (5-19 Yrs.) from 2010-2016

Correlation between avg. GGHE-D (2010-2016) and avg. prevalence of thinness (%) among child & adolescent (5-19 yrs.) from 2010-2016.			
Value of	Both Sex	Male	Female
r	-0.533	-0.530	-0.536
N	24	24	24
D df	22	22	22
T Statistic	2.953	-2.933215646	-2.9744678
p value	0.007	0.008	0.007
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom,*T Statistic= Test Statistic & *'p value' stands for probability value.			

Table 4.1.5.3.10

Correlation between Avg. OOPE And Avg. Prevalence of Thinness Among Child and Adolescent (5-19 Yrs.) from 2010-2016 in(%)

Correlation between avg. OOPE(2010-2016) and avg. prevalence of thinness(%) among child & adolescent (5-19 yrs.) from 2010-2016.			
Value of	Both Sex	Male	Female
r	0.682	0.676	0.689
N	24	24	24
Df	22	22	22
T Statistic	4.372	4.305	4.458
p value	0.0002	0.0003	0.0002
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom,*T Statistic= Test Statistic & *'p value' stands for probability value.			

It is observed that Domestic General Government Health Expenditure is negatively correlated with prevalence of thinness among child and adolescent (5- 19Yrs.) (Table 4.1.5.3.9**),** but OOPE is positively correlated with prevalence of thinness among child and adolescent (5-119n Yrs.) (Table 4.1.5.3.10**)**.

Table 4.1.5.3.11

Correlation between Avg. GGHE-D and Avg. Prevalence of Under- Weight Adult (%) (20yrs & old) from 2010-2016

Correlation between avg. GGHE-D and avg. prevalence of under- weight adult (%) (20yrs & old)) from 2010-2016.			
Value of	Both Sex	Male	Female
r	-0.575	-0.579	-0.561
N	24	24	24
df	22	22	22
T Statistic	-3.298	-3.333	-3.181
p value	0.003	0.003	0.004
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of freedom,*T Statistic= Test Statistic and *'p value' stands for probability value.			

Table 4.1.5.3.12

Correlation between Avg. OOPE and Avg. Prevalence of Under- Weight Adult (%) (20yrs & Older) from 2010-2016

Correlation between avg. OOPE and avg. prevalence of under-weight adult (%) (20 yrs. and older) from 2010-2016			
Value of	Both Sex	Male	Female
r	0.715	0.719	0.701
N	24	24	24
Df	22	22	22
T Statistic	4.803	4.854	4.617
p value	0.0001	0.0001	0.0001
*r stands for Pearson Coefficient Correlation, *N= Number of observation, Df=Degree of Freedom,*T Statistic= Test Statistic and *'p value' stands for probability value.			

It is also noticed that Domestic Government Health Expenditure is negatively correlated with adult underweight prevalence and Out Of Pocket Expenditure is positively correlated with the adult underweight prevalence (Table 4.1.5.3.11 -4.1.5.3.12).

4.1.5.4 Over weight:

Table 4.1.5.4.1

Prevalence of Overweight among Children Under 5 Yrs. Age (%), 2010 to 2020

Countries	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
United States	8.4	8.5	8.6	8.6	8.7	8.7	8.8	8.8	8.8	8.8	8.8
China	7.0	7.1	7.2	7.3	7.4	7.5	7.5	7.7	7.9	8.1	8.3
Japan	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.4
Germany	3.6	3.7	3.7	3.8	3.8	3.8	3.9	3.9	4.0	4.1	4.1
India	2.6	2.5	2.4	2.3	2.2	2.1	2.1	2.0	2.0	1.9	1.9
Canada	10.8	11.0	11.2	11.3	11.5	11.6	11.7	11.7	11.8	11.8	11.8
Korea Republic	7.4	7.6	7.7	7.9	8.0	8.2	8.3	8.5	8.6	8.7	8.8
Brazil	6.8	6.8	6.9	6.9	7.0	7.1	7.1	7.1	7.2	7.2	7.3
Australia	13.0	13.6	14.2	14.9	15.5	16.1	16.7	17.3	17.7	18.2	18.5
Mexico	6.9	6.8	6.7	6.6	6.6	6.5	6.4	6.4	6.4	6.3	6.3
Indonesia	7.2	7.7	8.2	8.6	9.1	9.5	10.0	10.3	10.7	10.9	11.1
Netherlands	3.8	3.9	4.1	4.2	4.3	4.4	4.5	4.7	4.8	4.9	5.0
Saudi Arabia	5.5	5.9	6.2	6.4	6.7	6.9	7.1	7.3	7.4	7.5	7.6
Poland	5.6	5.7	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7
Belgium	4.3	4.4	4.5	4.5	4.6	4.7	4.8	4.9	4.9	5.0	5.1
Thailand	8.4	8.6	8.7	8.8	8.9	9.0	9.1	9.1	9.2	9.2	9.2
	*Data of UK, France, Italy, Russian Federation, Spain, Turkey, Switzerland and Sweden is not available**.** Last updated on 08.04.2021 by WHO.										

Table 4.1.5.4.2

Projected Prevalence of Overweight by 2025 and 2030

Countries	Prevalence of overweight in 2020 (%)	Average Annual Growth Rate (%)	Projected prevalence of overweight by 2025	Projected prevalence of overweight by 2030
United States	8.8	0.47	9.01	9.22
China	8.3	1.72	9.04	9.84
Japan	2.4	2.39	2.70	3.04
Germany	4.1	1.32	4.38	4.67
India	1.9	-3.07	1.63	1.39
Canada	11.8	0.89	12.34	12.90
Korea Republic	8.8	1.75	9.60	10.47
Brazil	7.3	0.71	7.56	7.84
Australia	18.5	3.60	22.07	26.34
Mexico	6.3	-0.90	6.02	5.75
Indonesia	11.1	4.44	13.79	17.14
Netherlands	5	2.79	5.74	6.58
Saudi Arabia	7.6	3.30	8.94	10.52
Poland	6.7	1.81	7.33	8.02
Belgium	5.1	1.72	5.56	6.05
Thailand	9.2	0.92	9.63	10.08

Table 4.1.5.4.3

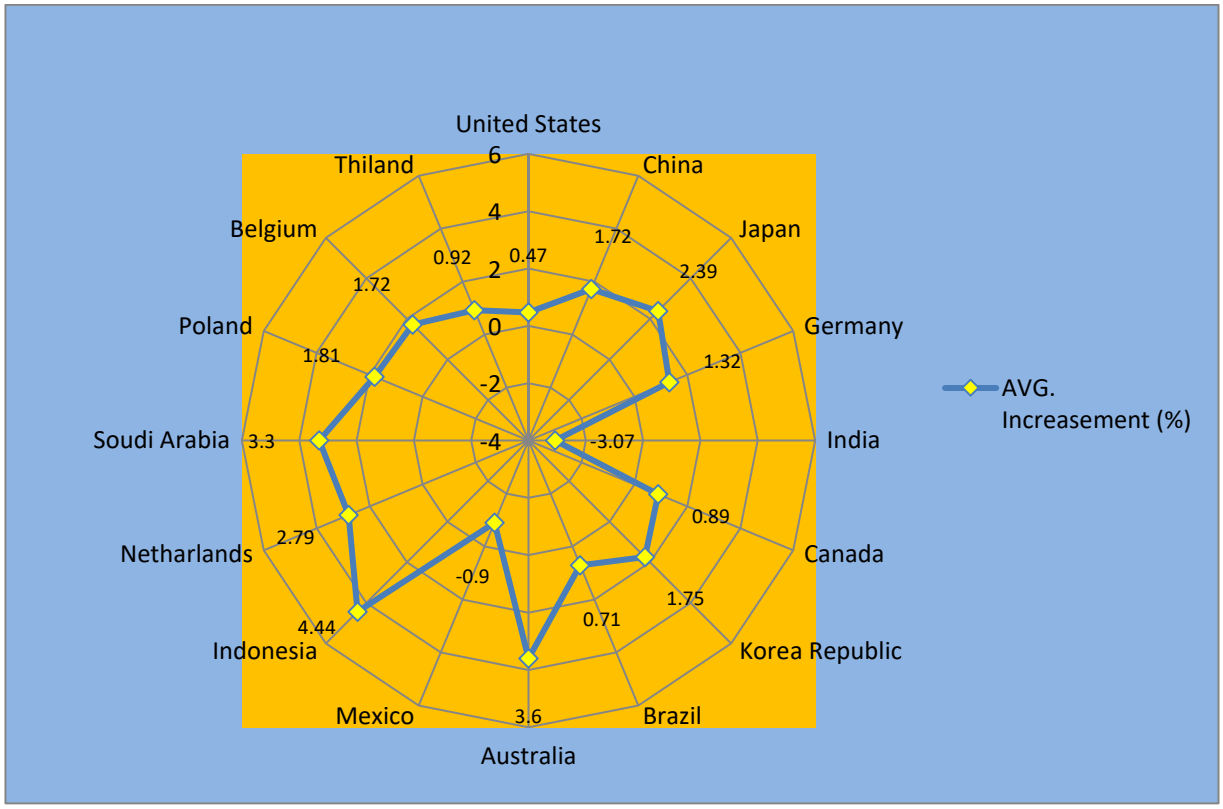
India's Overweight Prevalence Under 5 Yrs. Age as per NFHS

NFHS-3) (2005-06)	NFHS-4) (2015-16)	NFHS-5 (2019-21)			NFHS 4 to NFHS 5 Growth Rate (%)
Total	Total	Urban	Rural	Total	Total
-	2.1	4.2	3.2	3.4	61.90

As per available data of selected countries from WHO, it is found that Australia (18.5) is having with highest overweight prevalence of children under 5 yrs. age, 2nd and 3rd highest ranked countries suffering from overweight prevalence are Canada (11.8) and Indonesia (11.1) respectively in the year 2020. Only the five countries scores (Japan, Germany, India, Netherlands and Belgium) among the selected countries (given in the Table No. 4.5.4.1) are lower than the World score i.e. 5.7 and all the selected countries except India and Mexico, are showing increasing tendencies of values in respect of previous year- values. The least scoring country is India. In the year 2019 and 2020 India maintained a statuesque position keeping the value (1.9) same for those two consecutive years.

Figure 4.1.5.4.1

Avg. Annual Growth In Overweight Prevalence Of Children Under 5 Yrs. of Age (2010-20) (%)



The Radar diagram (Figure No. 4.1.5.4.1) regarding average annual growth of overweight prevalence among the children under five yrs. age (2010 to 2020) shows that only two countries, India and Mexico have achieved decreased average annual growth rate but all of the other selected countries are struggling with the increased average annual overweight prevalence for the last 10 years 2010 to 2020.

AS per World Health Assembly (2012) the targets not to increase the overweight prevalence Under Five by 2025 will be achieved by India, but the data from NFHS-4 (2015-16) and NFSH-5 (2019-21) regarding the percentage of children who are overweight under 5 years are 2.1 and 3.4 respectively which reflects 61.90 % growth (Table No.4.1.5.4.3).

Table 4.1.5.4.4

Average Overweight (BMI ≥25) Prevalence among Children and Adolescent (5-19 Yrs.) (%) 2010-16

SL. No.	Average Overweight prevalence among children and adolescent (5-19 yrs.) (BMI>25) from 2010 to 2016 (Highest to Lowest value) in (%)							
	COUNTRIES	**Both Sex**		**COUNTRIES**	**Male**		**COUNTRIES**	**Female**
1	**United States**	40.97		**United States**	43.04		**United States**	38.80
2	**Italy**	35.77		**Italy**	38.43		**Mexico**	33.69
3	**Mexico**	33.99		**Spain**	36.21		**Italy**	32.96
4	**Australia**	33.69		**Saudi Arabia**	35.81		**Australia**	32.36
5	**Saudi Arabia**	33.60		**Australia**	34.33		**United Kingdom**	31.36
6	**Spain**	33.11		**Mexico**	34.26		**Saudi Arabia**	31.00
7	**Canada**	31.59		**Canada**	32.57		**Spain**	29.87
8	**United Kingdom**	30.87		**Korea Republic**	30.94		**Canada**	29.66
9	**France**	29.21		**United Kingdom**	30.43		**France**	27.96
10	**Turkey**	27.51		**France**	30.41		**Turkey**	27.10
11	**Brazil**	26.36		**China**	29.04		**Brazil**	25.09
12	**Germany**	25.66		**Turkey**	27.87		**Belgium**	24.54
13	**Korea Republic**	25.40		**Poland**	27.87		**Germany**	23.89
14	**Belgium**	24.30		**Brazil**	27.60		**Netherlands**	23.40
15	**Netherlands**	24.10		**Germany**	27.34		**Sweden**	21.60
16	**China**	23.63		**Netherlands**	24.79		**Switzerland**	20.57
17	**Poland**	23.10		**Sweden**	24.50		**Korea Republic**	19.40
18	**Sweden**	23.07		**Belgium**	24.04		**Poland**	18.11
19	**Switzerland**	21.27		**Switzerland**	22.27		**China**	17.39
20	**Thailand**	19.84		**Russian Federation**	21.99		**Thailand**	17.26
21	**Russian Federation**	19.41		**Thailand**	21.26		**Russian Federation**	16.69
22	**Japan**	14.44		**Japan**	16.91		**Indonesia**	12.43
23	**Indonesia**	13.21		**Indonesia**	13.96		**Japan**	11.84
24	**India**	5.53		**India**	5.96		**India**	5.04
Data computed from WHO, Global Health Observatory, Last updated 29.09.2017								

Average percentages of overweight prevalence among children and adolescent (5-19yrs) from 2010 to 2016 for Female in all selected countries except in Belgium are lower than that of Male (Table 4.1.5.4.4, Figure 4.1.5.4.4). United States possess the highest average percentage of overweight children and adolescent (2010-2016) having the values 40.97 for both sex, 43.04 for Male and 38.80 for Female. India is in safe zone having its avg. values 5.53 for both sex, 5.96 for Male and 5.04 for Female which are the lowest among values of all the selected countries . Indonesia also possesses the lower values next to India but the values are much higher in case of both sex, Male and Female than that of India.(Table 4.1.5.4.4 and Figure 4.1.5.4.4).

Table 4.1.5.4.5

AAGR in Overweight (BMI≥25) Prevalence in Children and Adolescent (5-19yrs) (%), 2010-2016

SL. No	Average Annual Growth Rate in Overweight Prevalence Among Children & Adolescent (5-19 Yrs.) (BMI>25) from 2010 to 2016 (Highest To Lowest Value) (%)							
	COUNTRIES	**Both Sex**		**COUNTRIES**	**Male**		**COUNTRIES**	**Female**
1	**India**	7.53		**India**	8.25		**China**	6.91
2	**China**	7.09		**Thailand**	8.14		**India**	6.85
3	**Thailand**	5.94		**China**	7.22		**Thailand**	5.14
4	**Indonesia**	5.61		**Indonesia**	6.20		**Indonesia**	4.83
5	**Poland**	3.67		**Poland**	3.72		**Poland**	3.47
6	**Russian Federation**	3.33		**Russian Federation**	3.65		**Russian Federation**	2.84
7	**Turkey**	2.46		**Turkey**	2.98		**Turkey**	1.86
8	**Brazil**	2.11		**Brazil**	2.57		**Korea Republic**	1.73
9	**Saudi Arabia**	2.01		**Saudi Arabia**	2.36		**Brazil**	1.68
10	**Korea Republic**	1.85		**Korea Republic**	1.90		**Mexico**	1.45
11	**Mexico**	1.43		**Mexico**	1.42		**Saudi Arabia**	1.41
12	**Spain**	1.01		**Canada**	1.10		**Spain**	1.29
13	**Italy**	0.94		**Sweden**	0.96		**Italy**	1.07
14	**France**	0.92		**Netherlands**	0.95		**France**	1.02
15	**Germany**	0.91		**Germany**	0.92		**Germany**	0.98
16	**Sweden**	0.87		**France**	0.88		**Switzerland**	0.83
17	**Canada**	0.86		**Australia**	0.88		**Sweden**	0.77
18	**Netherlands**	0.83		**United States**	0.86		**Netherlands**	0.72
19	**United States**	0.69		**Italy**	0.83		**Canada**	0.68
20	**Australia**	0.62		**Spain**	0.79		**United States**	0.52
21	**Switzerland**	0.58		**Switzerland**	0.56		**Australia**	0.44
22	**United Kingdom**	0.27		**United Kingdom**	0.44		**United Kingdom**	0.05
23	**Belgium**	-0.41		**Japan**	-0.59		**Japan**	0.00
24	**Japan**	-0.46		**Belgium**	-0.62		**Belgium**	-0.34
Data computed from WHO, Global Health Observatory, Last updated 29.09.2017								

Increasing tendencies of avg. annual overweight prevalence among children and adolescent (%) are found in almost all selected countries from 2010 to 2016 except Japan & Belgium. Negative increasing tendency is noticed for both sex and Male in case of Japan and for both sex, male & female in case of Belgium. In spite of having lowest average values in all categories from 2010 to 2016, average annual growth of overweight prevalence (%) among children and adolescent **is highest in India in both sex (7.53) & male (8.25)**. China stands for 2nd highest for value of both sex (7.09) and **highest for Female categories having values (6.91)** among all selected countries. Thailand is also struggling with high growing overweight tendencies. (Table No. 4.1.5.4.5)(Figure No. 4.1.5.4.3).

Figure 4.1.5.4.2

Average Overweight Prevalence among Children and Adolescent (5-19yrs.) 2010-2016

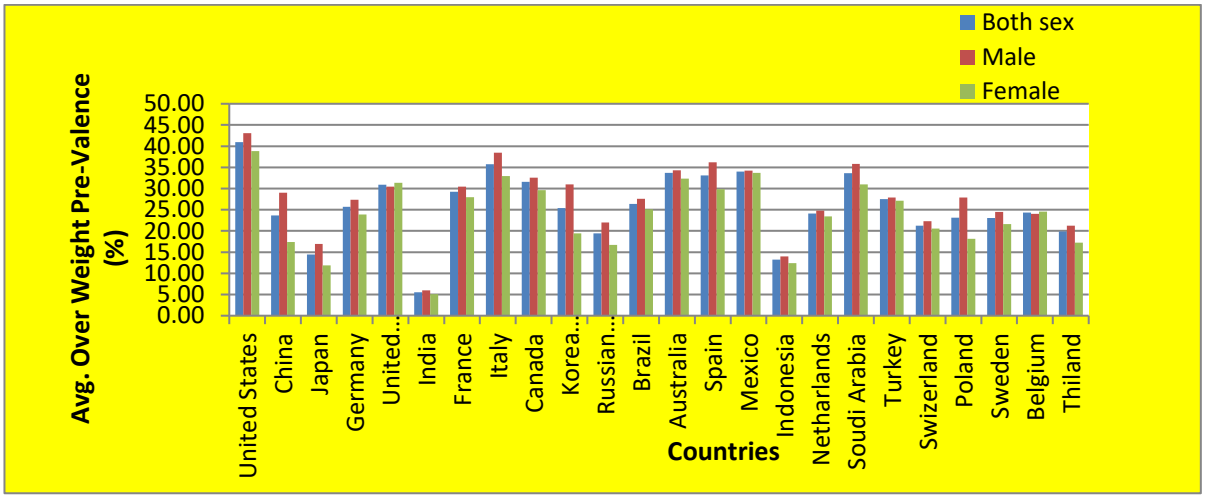


Figure 4.1.5.4.3

Average Annual Growth in Overweight Prevalence among Children and Adolescent (5-19 Yrs.) from 2010-2016 (%)

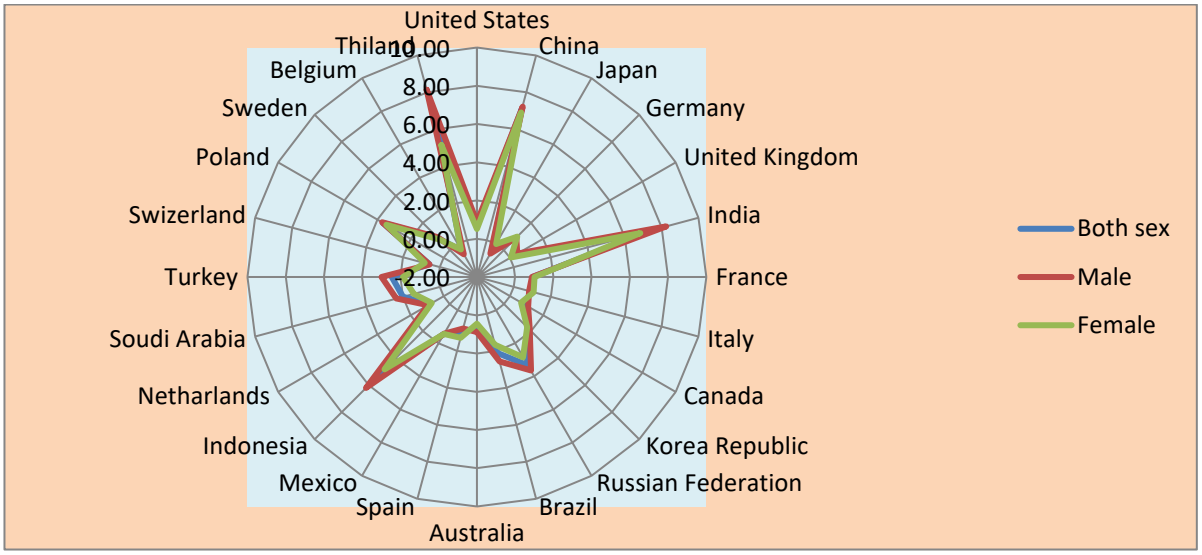


Table 4.1.5.4.6

Average Overweight(BMI≥25) Prevalence Among Adult (%) from 2010 to 2016

SL. No.	Average Overweight Prevalence among Adult (BMI>25) from 2010 to 2016 (Highest to Lowest value) (%) .							
	COUNTRIES	**Both Sex**		**COUNTRIES**	**Male**		**COUNTRIES**	**Female**
1	**Saudi Arabia**	68.04		**United States**	71.29		**Saudi Arabia**	70.59
2	**United States**	66.36		**Australia**	69.53		**Turkey**	67.76
3	**Turkey**	64.97		**Canada**	68.40		**Mexico**	64.63
4	**Mexico**	63.33		**Spain**	67.57		**United States**	61.56
5	**Australia**	63.11		**United Kingdom**	67.04		**United Kingdom**	57.39
6	**Canada**	62.69		**Belgium**	66.49		**Canada**	57.00
7	**United Kingdom**	62.17		**Saudi Arabia**	66.37		**Australia**	56.70
8	**Spain**	60.53		**France**	65.40		**Russian Federation**	55.24
9	**Belgium**	58.63		**Italy**	64.04		**Brazil**	53.90
10	**France**	58.16		**Poland**	63.81		**Spain**	53.24
11	**Italy**	57.21		**Netherlands**	63.71		**France**	51.13
12	**Poland**	56.96		**Germany**	63.70		**Belgium**	50.77
13	**Netherlands**	56.44		**Sweden**	62.70		**Italy**	50.39
14	**Russian Federation**	55.99		**Turkey**	61.84		**Poland**	50.13
15	**Germany**	55.67		**Mexico**	61.80		**Netherlands**	49.11
16	**Sweden**	55.19		**Switzerland**	61.33		**Germany**	47.51
17	**Brazil**	54.63		**Russian Federation**	56.31		**Sweden**	47.51
18	**Switzerland**	53.14		**Brazil**	55.30		**Switzerland**	45.00
19	**China**	30.04		**Korea Republic**	32.51		**Thailand**	32.96
20	**Thailand**	29.61		**China**	31.59		**Indonesia**	29.03
21	**Korea Republic**	29.23		**Japan**	30.74		**China**	28.40
22	**Japan**	26.06		**Thailand**	25.94		**Korea Republic**	25.80
23	**Indonesia**	25.76		**Indonesia**	22.36		**Japan**	21.27
24	**India**	18.06		**India**	16.17		**India**	19.96
Data computed from WHO, Global Health Observatory, Last updated 28.09.2017								

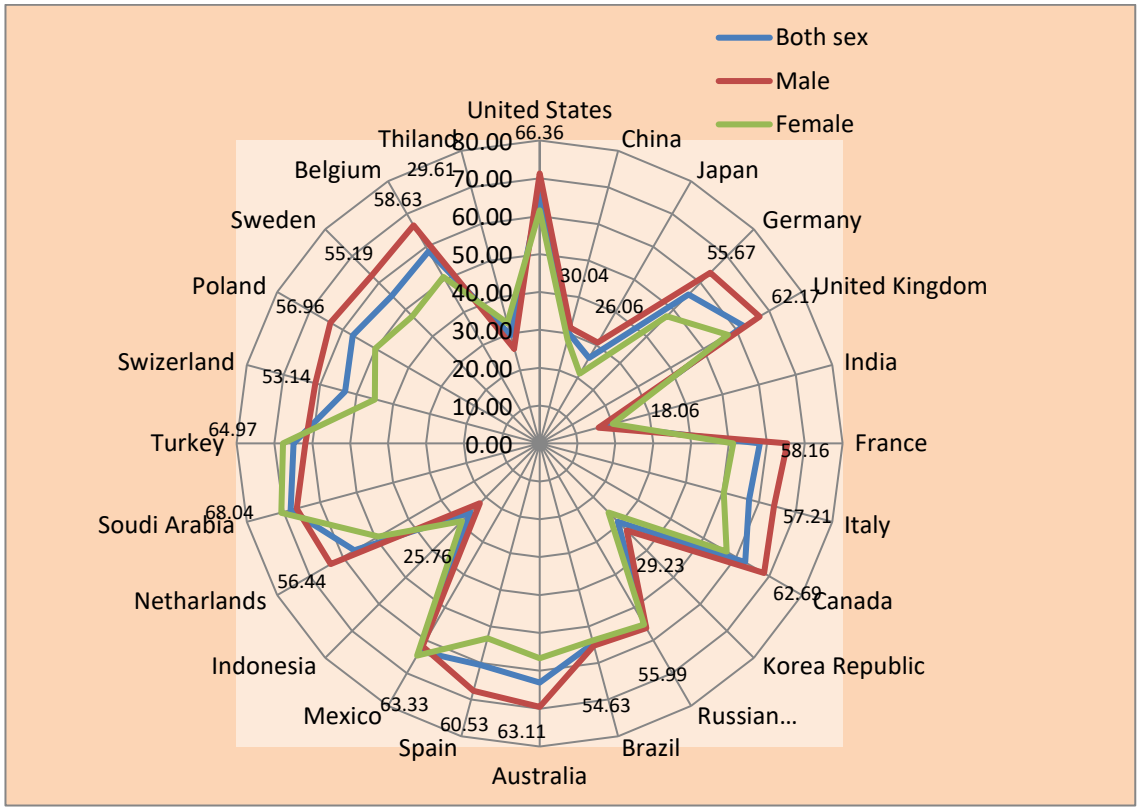
Table 4.1.5.4.7

AAGR in Overweight (BMI≥25) Prevalence among Adult (%) from 2010 to 2016

SL. No.	AAGR in Overweight prevalence among adult (BMI≥25) from 2010 to 2016 (Highest to Lowest value) (%) .							
	COUNTRIES	**Both Sex**		**COUNTRIES**	**Male**		**COUNTRIES**	**Female**
1	**Thailand**	3.38		**Thailand**	4.21		**Thailand**	2.72
2	**Indonesia**	3.16		**Indonesia**	3.96		**India**	2.71
3	**India**	3.00		**India**	3.36		**Indonesia**	2.50
4	**China**	2.53		**China**	3.12		**China**	2.02
5	**Japan**	1.48		**Japan**	1.98		**Brazil**	0.93
6	**Korea Republic**	1.20		**Korea Republic**	1.50		**United Kingdom**	0.91
7	**Brazil**	1.17		**Brazil**	1.40		**United States**	0.90
8	**Turkey**	0.95		**Turkey**	1.19		**Canada**	0.88
9	**Mexico**	0.85		**Russian Federation**	1.13		**Japan**	0.87
10	**United Kingdom**	0.83		**Saudi Arabia**	0.98		**Australia**	0.83
11	**Netherlands**	0.83		**Mexico**	0.98		**Korea Republic**	0.78
12	**Saudi Arabia**	0.81		**Netherlands**	0.92		**Turkey**	0.77
13	**Poland**	0.79		**Poland**	0.92		**Italy**	0.76
14	**United States**	0.78		**Sweden**	0.80		**Netherlands**	0.75
15	**France**	0.78		**United Kingdom**	0.77		**France**	0.72
16	**Canada**	0.77		**France**	0.77		**Mexico**	0.70
17	**Sweden**	0.76		**Switzerland**	0.71		**Switzerland**	0.67
18	**Australia**	0.74		**Canada**	0.68		**Germany**	0.67
19	**Italy**	0.73		**United States**	0.68		**Sweden**	0.67
20	**Switzerland**	0.72		**Italy**	0.68		**Poland**	0.63
21	**Germany**	0.66		**Australia**	0.67		**Saudi Arabia**	0.59
22	**Russian Federation**	0.66		**Spain**	0.67		**Spain**	0.53
23	**Spain**	0.61		**Germany**	0.63		**Belgium**	0.43
24	**Belgium**	0.48		**Belgium**	0.55		**Russian Federation**	0.27
Data computed from WHO, Global Health Observatory, Last updated 28.09.2017								

Figure 4.1.5.4.4

Average Annual Overweight Prevalence among Adult 2010 -2016, (%) BMI≥25



Average overweight prevalence percentages among adult female from 2010 to 2016 are higher than that of the adult male in India, Mexico, Indonesia, Saudi Arabia, Turkey & Thailand. Besides that, other selected countries had greater average values of over-weight adult Male than that of the Female. Like children and adolescent, India had lowest average percentage of overweight prevalence in adult (both sex 18.06, male 16.17, female 16.96) among all the selected countries but the values for the adult is much higher than that of the Children and adolescent for all categories, approx. 3.36 times of values of children and adolescent for both sex, approx. 2.71 times of values of children and adolescent for Male and approx. 4 times of values of children and adolescent for Female (Table No.4.1.5.4.4 & Table No.4.1.5.4.6). The Highest average annual increasing % of overweight adult found in Thailand from the year 2010 to 2016 for all the categories. Indonesia possessed 2nd highest position in only two categories i.e. for Both sex (3.16) & for Male(3.96) but India possessed 2nd highest position for female category (2.71) being 3rd highest country in respect of values for Both sex (3.00) & for Male (3.36). Values for all categories(both sex, Male and Female) regarding average annual increasing % of overweight adult in all countries reflected increasing tendencies. (Table 4.1.5.4.7 & Figure 4.1.5.4.4).

Figure 4.1.5.4.5

Average Annual Growth Rate in Overweight Prevalence (BMI≥25) Among Adult 2010-2016,(%)

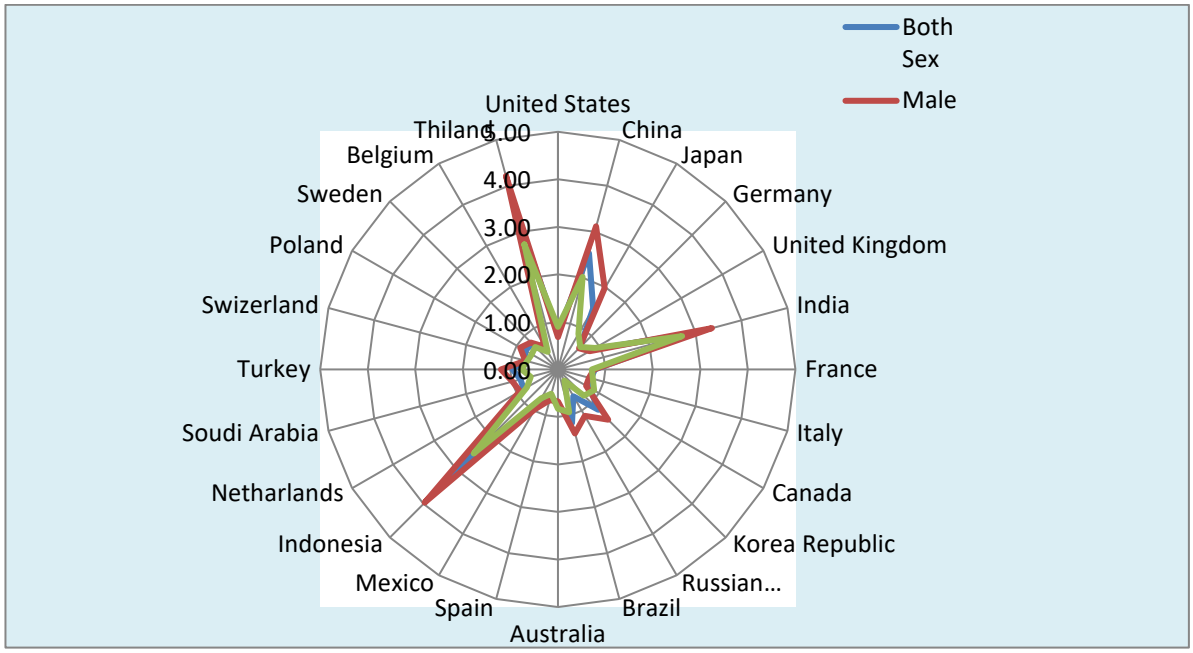


Table 4.1.5.4.8

Indicator Regarding Adult BMI in India (Age 15-49 Yrs.) as per NFHS

Indicators	NFHS-4 (2015-16)	NFHS-5 (2019-21)		
	TOTAL	**URBAN**	**RURAL**	**TOTAL**
Women(Age 15-49) whose Body Mass Index (BMI) is below normal (BMI<18.5 kg/m2)(%)	**22.9**	**13.2**	**21.2**	**18.7**
Men (Age 15-49) whose Body Mass Index (BMI) is below normal (BMI<18.5 kg/m2)(%)	**20.2**	**13**	**17.8**	**16.2**
Women (Age 15-49) who are overweight or obese (BMI≥25Kg/m2) (%)	**20.6**	**33.2**	**19.7**	**24**
Men (Age 15-49) who are overweight or obese (BMI≥25Kg/m2) (%)	**18.9**	**29.8**	**19.3**	**22.9**

As per data from National Family Health Survey, NFHS-4 (2015-16) and NFHS-5 (2019-21) in India, increasing tendency is reflected in overweight women percentage (BMI≥ 25) from 2015-16 to 2019-21 (NFHS-4 to NFHS-5) by 20.6 to 24 and for that of men 18.9 to 22.9 as a whole (Urban and Rural). Overweight values for both in men and women are greater in Urban area than Rural.(Table No. 4.1.5.4.8).

Table 4.1.5.4.9

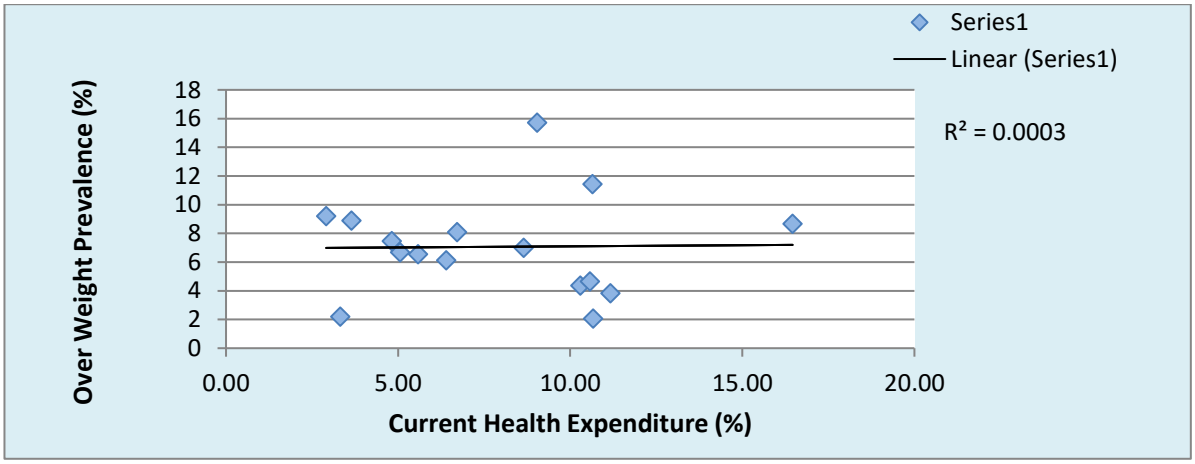
Coefficient Correlation between Health Expenditure and Overweight prevalence Under 5yrs Age

Coefficient Correlation Between Health Expenditure (% of GDP) and Overweight Prevalence Under 5yrs Age (2010-19)	
	Value
r	0.0167
N	16
df	14
T Statistic	0.063
p value	0.9507

*r stands for Pearson Coefficient Correlation, N=Number of Observations, df =Degree of Freedom, T. Statistic=Test Statistic, p value=probability value.

Figure 4.1.5.4.6

Correlation between Avg. Current Health Expenditure and Avg. Annual Overweight Prevalence Under 5 Yrs. Age (2010-2019)



No significant correlation is found between Current avg. health expenditure (% of GDP) and prevalence of avg. overweight children under 5 years age (%) from 2010 to 2019.(Table-4.1.5.4.9) (Figure 4.1.5.4.6).

Table 4.1.5.4.10

Coefficient Correlation Between GGHE-D and Overweight prevalence Under 5yrs Age (2010-19)

Coefficient correlation between GGHE-D and Overweight Prevalence under 5yrs age (2010-19)	
	Value
r	0.0163
N	16
df	14
T Statistic	0.061
p value	0.952

*r stands for Pearson Coefficient Correlation, N=Number of Observations, df =Degree of Freedom, T. Statistic=Test Statistic, p value=probability value.

Table 4.1.5.4.11

Coefficient Correlation Between OOPE and Overweight prevalence Under 5yrs Age (2010-19)

Coefficient correlation between OOPE and Overweight Prevalence under 5yrs age (2010-19)	
	Value
r	-0.151
N	16
df	14
T Statistic	0.57
p value	0.578

*r stands for Pearson Coefficient Correlation, N=Number of Observations, df =Degree of Freedom, T. Statistic=Test Statistic, p value=probability value

No significant correlation is observed between GGHE-D and Overweight prevalence under five year children and also no significant correlation is detected between avg. OOPE and avg. Overweight prevalence from 2010-2019 (Table 4.1.5.4.10 and Table 4.1.5.4.11).

Table 4.1.5.4.12

Correlation between Avg. Annual Health Expenditure (% Of GDP) and Avg. Annual Prevalence of Overweight (%) Among Child and Adolescent (5-19 Yrs.) BMI<18, from 2010-2016

Correlation between avg. annual Health expenditure (%) of GDP (2010-2016) and avg. annual prevalence of overweight (%) among child & adolescent (5-19 yrs.) BMI<18, from 2010-2016.			
Value	Both Sex	Male	Female
r	0.476	0.435	0.512
N	24	24	24
df	22	22	22
T Statistic	2.542	2.264	2.793
p value	0.0186	0.034	0.011
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.			

Figure 4.1.5.4.7

Correlation between Average Annual Health Expenditure(% of GDP) and Average Annual Prevalence of Over Weight Child & Adolescent (5-19 Yrs.) from 2010-2016

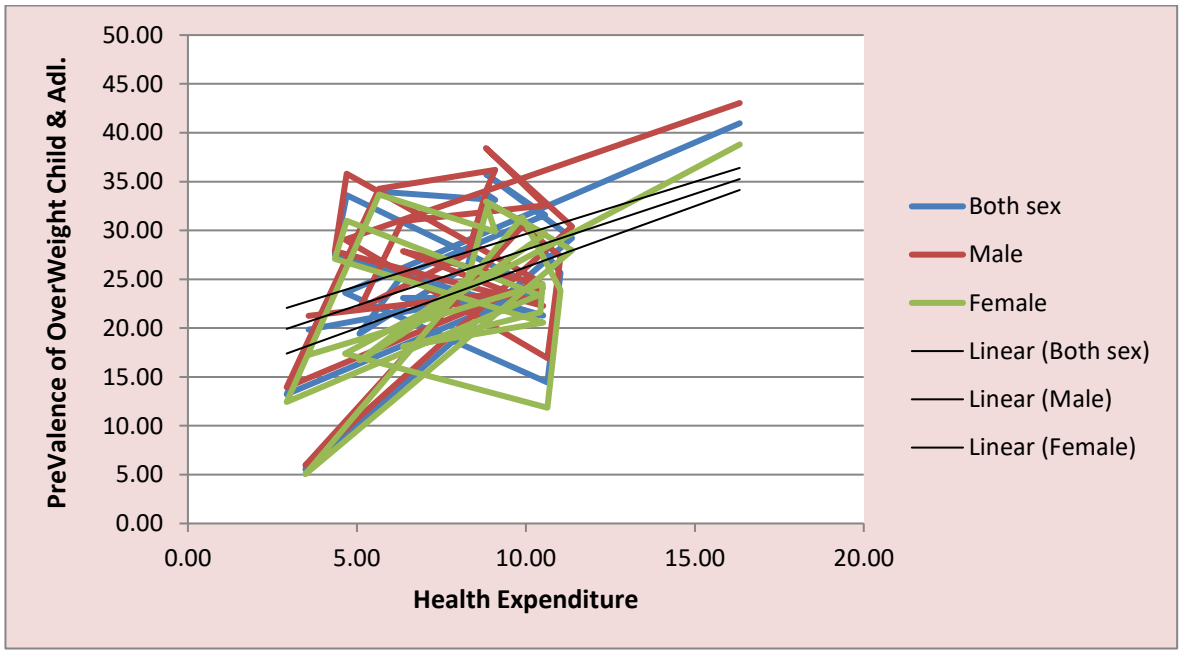


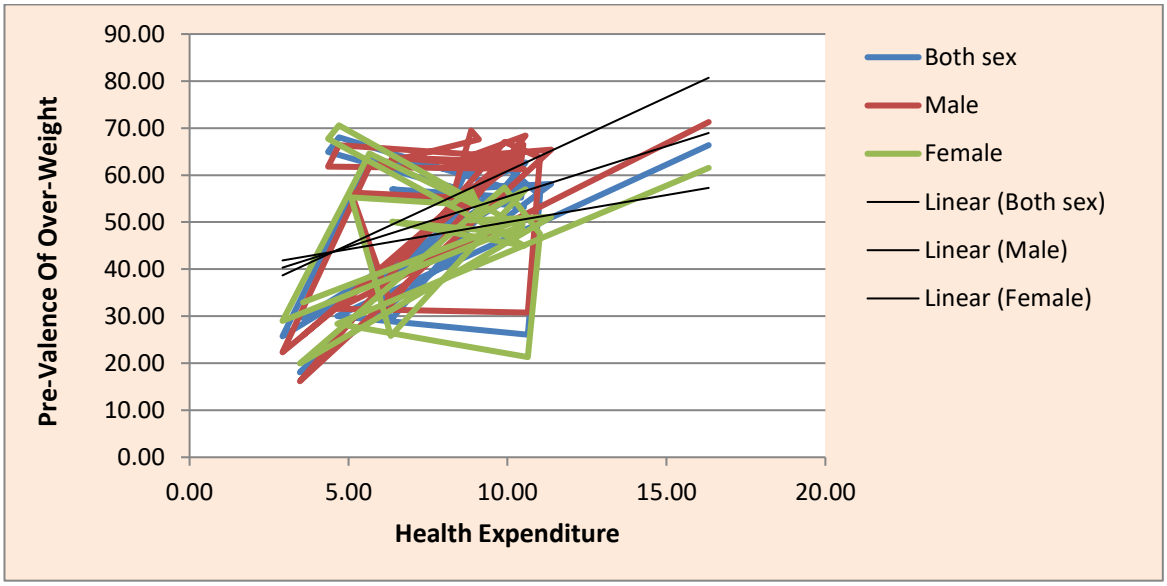
Table 4.1.5.4.13

Correlation between Avg. Annual Health Expenditure (%) of GDP and Avg. Annual Prevalence of Overweight (%) Among Adult BBMI≥25, from 2010-2016

Correlation between avg. annual Health expenditure (%) of GDP and avg. annual prevalence of overweight (%) among Adult BMI≥25, from 2010-2016.			
Value	Both Sex	Male	Female
r	0.465	0.602	0.267
N	24	24	24
df	22	22	22
T Statistic	2.461	3.54	1.3
p value	0.022	0.002	0.207
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.			

Figure 4.1.5.4.8

Correlation between Average Annual Health Expenditure (% of GDP) and Avg. Annual Prevalence of Overweight Among Adult(BMI≥25) from 2010-2016



Positive moderate association is found between average annual health expenditure(% of GDP) and average annual prevalence of overweight (BMI> 1+ standard deviation above the median) among child and adolescent for both sex, male and female from the year 2010 to 2016(Table 4.5.4.12 and Figure 4.5.4.7). Positive moderate correlation is also found between average annual health expenditure (% of GDP) and average annual prevalence of overweight(BMI≥25) among adult for both sex, male and female from the year 2010 to 2016 (Table 4.1.5.4.13 and Figure 4.1.5.4.8).

Table 4.1.5.4.14

Correlation between Avg. GGHE-D and Avg. Annual Prevalence Of Overweight (%) Among child and adolescent (5-19 yrs.) from 2010-2016

Correlation between avg. GGHE-D (2010-2016) and avg. prevalence of overweight (%) among child & adolescent (5-19 yrs.) from 2010-2016			
Value	Both Sex	Male	Female
r	0.354	0.352	0.333
N	24	24	24
df	22	22	22
T Statistic	1.776	1.764	1.654
p value	0.090	0.092	0.112
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom,*T Statistic= Test Statistic & *'p value' stands for probability value.			

Table 4.1.5.4.15

Correlation between Avg. OOPE and Avg. Annual Prevalence Of Overweight (%) Among Child and Adolescent (5-19 Yrs.) from 2010-2016

Correlation between avg. OOPE (2010-2016) and avg. prevalence of overweight (%) among child and adolescent (5-19 yrs.) from 2010-2016			
Value	Both Sex	Male	Female
r	-0.537	-0.505	-0.543
N	24	24	24
df	22	22	22
T Statistic	-2.984	-2.744	-3.030
p value	0.007	0.012	0.006
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom, *T Statistic= Test Statistic & *'p value' stands for probability value.			

Table 4.1.5.4.16

Correlation between Avg. GGHE-D and Avg. Annual Prevalence Of Overweight (%) Among Adult BMI≥25, from 2010-2016

Correlation between avg. GGHE-D and avg. prevalence of overweight (%) among Adult BMI≥25, from 2010-2016.			
Value	Both Sex	Male	Female
r	0.380	0.428	0.295
N	24	24	24
df	22	22	22
T Statistic	1.929	2.218	1.447
p value	0.067	0.037	0.162
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom,*T Statistic= Test Statistic & *'p value' stands for probability value.			

Table 4.1.5.4.17

Correlation between Avg. OOPE and Avg. Annual Prevalence of Overweight (%) Among Adult BMI≥25, from 2010-2016

Correlation between avg. OOPE and avg. prevalence of overweight (%) among Adult BMI≥25, from 2010-2016.			
Value	Both Sex	Male	Female
r	-0.563	-0.621	-0.455
N	24	24	24
df	22	22	22
T Statistic	-3.194	-3.712	-2.399
p value	0.004	0.001	0.025
*r stands for Pearson Coefficient Correlation, *N= Number of observation, df=Degree of Freedom,*T Statistic= Test Statistic & *'p value' stands for probability value.			

No significant correlation is found between GGHE-D and Prevalence of overweight child and adolescent (5-19yrs.), and between GGHE-D and Prevalence overweight adult in case of both sex, in male and in female.

Moderately negative correlation is observed between OOPE and overweight prevalence (5-19 yrs.) and between OOPE and overweight prevalence in adult in all categories (Both sex, Male and Female).

4.1.6 Health Expenditure

Table 4.1.6.1

Current Health Expenditure (% of GDP) from 2010 to 2019

Current Health Expenditure (% OF GDP)										
COUNTRIES	**YEAR 2010**	**YEAR 2011**	**YEAR 2012**	**YEAR 2013**	**YEAR 2014**	**YEAR 2015**	**YEAR 2016**	**YEAR 2017**	**YEAR 2018**	**YEAR 2019**
United States	16.26	16.2	16.18	16.06	16.25	16.52	16.84	16.81	16.69	16.77
China	4.23	4.34	4.57	4.71	4.78	4.94	4.98	5.07	5.17	5.35
Japan	10.49	10.49	10.67	10.67	10.73	10.75	10.66	10.66	10.75	10.74
Germany	11.1	10.78	10.85	11	11.02	11.18	11.24	11.33	11.45	11.7
United Kingdom	9.84	9.85	9.91	9.98	9.95	9.9	9.87	9.81	9.9	10.15
India	3.27	3.25	3.33	3.75	3.62	3.6	3.5	2.94	2.95	3.01
France	11.23	11.18	11.3	11.42	11.54	11.45	11.47	11.33	11.19	11.06
Italy	8.92	8.77	8.78	8.78	8.87	8.86	8.73	8.68	8.68	8.67
Canada	10.7	10.4	10.51	10.41	10.25	10.73	11.02	10.84	10.81	10.84
Korea Republic	5.92	6.01	6.13	6.25	6.47	6.65	6.91	7.11	7.54	8.16
Russian Federation	4.97	4.79	4.94	5.08	5.18	5.3	5.29	5.36	5.36	5.65
Brazil	7.95	7.79	7.74	7.98	8.4	8.91	9.17	9.47	9.46	9.59
Australia	8.43	8.54	8.68	8.76	9.04	9.33	9.25	9.27	9.16	9.91
Spain	9.12	9.17	9.16	9.07	9.09	9.13	8.95	8.96	8.99	9.13
Mexico	5.74	5.52	5.67	5.81	5.55	5.72	5.55	5.46	5.38	5.43
Indonesia	2.79	2.99	2.91	2.87	2.96	2.92	3.02	2.9	2.87	2.9
Netherlands	10.16	10.23	10.54	10.58	10.57	10.32	10.29	10.11	10.03	10.13
Saudi Arabia	3.65	3.71	4.02	4.47	5.23	6	5.84	6.26	5.75	5.69
Turkey	4.65	4.44	4.37	4.33	4.12	4.28	4.28	4.18	4.12	4.34
Switzerland	9.94	10.02	10.25	10.46	10.62	11.01	11.3	11.48	11.38	11.29
Poland	6.41	6.24	6.22	6.41	6.39	6.39	6.53	6.56	6.33	6.45
Sweden	8.32	10.42	10.74	10.9	10.95	10.8	10.85	10.79	10.94	10.87
Belgium	10.23	10.39	10.51	10.56	10.59	10.43	10.77	10.78	10.76	10.66
Thailand	3.39	3.57	3.52	3.45	3.68	3.67	3.75	3.84	3.82	3.79
WHO Global Health Observatory, data repository, Last updated by WHO 15-12-2021										

Table 4.1.6.2

Current Health Expenditure Per Capita in US$

Current Health Expenditure Per Capita (in US$)										
COUNTRIES	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
United States	7888.00	8080.00	8342.58	8522.13	8939.40	9392.07	9775.00	10103.09	10515.32	10921.01
China	186.50	236.40	281.68	326.04	359.31	390.10	395.36	437.26	501.06	535.13
Japan	4060.00	5087.00	5212.18	4336.11	4099.28	3733.38	4174.42	4121.04	4256.10	4360.47
Germany	4611.00	5037.00	4765.58	5099.64	5307.08	4624.56	4744.23	5055.82	5481.99	5440.25
United Kingdom	3905.00	4157.00	4222.08	4344.67	4740.11	4477.29	4067.18	3966.06	4270.22	4312.89
India	45.13	48.60	48.95	56.12	57.07	58.92	60.60	57.56	60.27	63.75
France	4592.00	4932.00	4644.60	4893.48	4982.99	4201.56	4257.15	4402.08	4657.75	4491.74
Italy	3218.00	3392.00	3086.30	3149.24	3154.28	2675.67	2699.73	2809.72	3000.71	2905.50
Canada	5066.00	5400.00	5500.68	5443.63	5189.01	4637.21	4629.38	4865.07	5018.71	5048.37
Korea Republic	1366.00	1513.00	1565.66	1700.95	1899.14	1919.04	2033.85	2257.52	2543.60	2624.53
Russian Federation	566.10	682.70	757.04	807.08	737.65	498.06	464.90	579.67	609.01	653.42
Brazil	896.70	1032.00	957.01	981.15	1017.05	785.26	798.63	940.37	866.16	853.39
Australia	4945.00	5862.00	6025.34	5813.99	5607.92	4862.60	4993.69	5340.36	5364.54	5427.46
Spain	2790.00	2909.00	2591.02	2629.61	2679.63	2349.05	2376.72	2526.72	2740.27	2711.19
Mexico	531.90	563.10	580.22	623.05	606.93	550.34	485.62	506.89	521.01	540.37
Indonesia	87.14	108.90	107.66	103.98	103.50	97.43	107.65	111.45	111.66	120.12
Netherlands	5192.00	5562.00	5284.69	5532.69	5601.90	4676.56	4753.67	4934.58	5336.98	5335.30
Saudi Arabia	702.70	881.40	1014.70	1109.51	1278.98	1237.33	1160.05	1302.77	1341.52	1316.26
Turkey	539.30	531.40	524.25	551.40	525.84	453.12	466.79	442.62	389.87	396.47
Switzerland	7705.00	9192.00	8917.12	9275.80	9578.65	9382.79	9439.42	9606.35	9870.66	9666.34
Poland	809.20	866.10	815.14	878.09	911.30	803.96	813.47	909.58	978.74	1014.04
Sweden	4416.00	6351.00	6254.44	6696.87	6605.91	5598.68	5680.73	5837.77	6005.07	5671.39
Belgium	4545.00	4944.00	4706.47	4947.77	5072.95	4291.49	4534.23	4775.81	5134.41	4960.39
Thailand	172.10	196.00	206.46	213.00	219.30	214.21	224.99	253.41	278.63	296.17
Data source: WHO Global Health Observatory & World Bank data Base (Last updated by WHO 15-12-2021).										

Table 4.1.6.3

Domestic General Government Health Expenditure (% of CHE) 2010-2019

Domestic General Government Health Expenditure (As % of CHE) 2010-2019										
COUNTRIES	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
United States	48.87	48.95	48.84	49.52	50.81	51.37	51.14	51.06	51.30	51.54
China	51.91	53.72	55.74	57.05	58.42	60.18	58.10	56.67	56.42	55.98
Japan	81.93	83.74	83.93	84.26	84.12	84.08	84.04	84.21	83.77	83.88
Germany	75.69	75.41	75.44	76.43	77.02	76.96	77.29	77.58	77.25	77.16
United Kingdom	80.87	80.88	80.62	80.41	80.45	80.38	80.87	80.37	80.10	80.23
India	26.21	28.87	27.99	23.07	23.66	25.64	26.84	32.95	34.29	33.48
France	70.44	70.21	70.29	70.30	70.33	72.27	75.01	75.72	75.78	75.16
Italy	78.45	77.01	75.88	75.76	75.42	74.44	74.40	73.74	73.86	73.74
Canada	69.92	70.24	70.47	70.74	70.59	70.66	69.68	69.73	69.86	69.78
Korea Republic	59.35	58.56	57.67	57.84	57.32	57.36	57.52	57.91	58.46	59.53
Russian Federation	61.38	62.65	63.71	62.38	61.79	58.72	56.95	57.09	59.46	61.15
Brazil	45.02	44.50	43.36	44.52	44.05	43.26	43.06	41.74	41.09	40.74
Australia	72.36	73.26	71.23	67.73	70.16	71.04	71.10	71.27	71.51	73.80
Spain	74.44	73.49	72.11	71.01	70.26	71.32	71.55	70.51	70.22	70.61
Mexico	50.22	52.80	53.08	53.75	52.08	52.20	51.28	50.54	49.67	49.17
Indonesia	23.69	23.48	26.33	28.47	33.48	39.60	45.53	46.48	48.68	48.94
Netherlands	68.42	68.38	68.46	69.01	67.83	66.05	65.48	64.32	65.73	65.90
Saudi Arabia	61.93	67.07	68.28	69.59	71.37	68.47	69.78	71.85	70.30	69.17
Turkey	78.00	79.13	79.17	78.35	77.61	78.13	78.44	77.71	77.38	77.69
Switzerland	32.36	32.94	33.74	32.79	32.10	31.82	31.00	31.56	31.22	32.11
Poland	71.35	71.03	69.83	70.30	69.94	69.33	68.81	68.82	71.09	71.38
Sweden	82.49	84.48	84.22	84.02	84.03	83.96	84.26	84.71	84.78	85.12
Belgium	76.25	76.18	76.62	76.19	76.37	76.69	77.14	77.20	77.25	76.00
Thailand	73.77	76.43	76.08	75.95	75.68	71.35	72.39	72.04	70.87	72.17
WHO Global Health Observatory, data repository, last updated by WHO , on 14.04.2023										

Table 4.1.6.4
Average Health Expenditure as % of GDP (2010-2019)

Sl. No.	Countries	Average Health Expenditure as % of GDP (2010-2019) Highest to Lowest)
1	**United States**	16.458
2	**France**	11.317
3	**Germany**	11.165
4	**Switzerland**	10.775
5	**Japan**	10.661
6	**Canada**	10.651
7	**Belgium**	10.568
8	**Sweden**	10.558
9	**Netherlands**	10.296
10	**United Kingdom**	9.916
11	**Spain**	9.077
12	**Australia**	9.037
13	**Italy**	8.774
14	**Brazil**	8.646
15	**Korea Republic**	6.715
16	**Poland**	6.393
17	**Mexico**	5.583
18	**Russian Federation**	5.192
19	**Saudi Arabia**	5.062
20	**China**	4.814
21	**Turkey**	4.311
22	**Thailand**	3.648
23	**India**	3.322
24	**Indonesia**	2.913

Table 4.1.6.5
AAGR in Current Health Expenditure from 2010 To 2019

Sl. No.	Countries	Average Annual Growth Rate IN CURRENT Health Expenditure (2010 to 2019) (Highest To Lowest value) (%).
1	**Saudi Arabia**	5.36
2	**Korea Republic**	3.65
3	**Sweden**	3.28
4	**China**	2.65
5	**Brazil**	2.14
6	**Australia**	1.85
7	**Russian Federation**	1.46
8	**Switzerland**	1.44
9	**Thailand**	1.29
10	**Germany**	0.60
11	**Indonesia**	0.48
12	**Belgium**	0.47
13	**United Kingdom**	0.35
14	**United States**	0.35
15	**Japan**	0.26
16	**Canada**	0.17
17	**Poland**	0.09
18	**Spain**	0.02
19	**Netherlands**	-0.02
20	**France**	-0.16
21	**Italy**	-0.31
22	**Mexico**	-0.58
23	**India**	-0.66
24	**Turkey**	-0.71

Data computed from the data of WHO Global health observatory last updated 15.12.2021

Figure 4.1.6.1

Average Annual Current Health Expenditure (% of GDP) 2010-2019

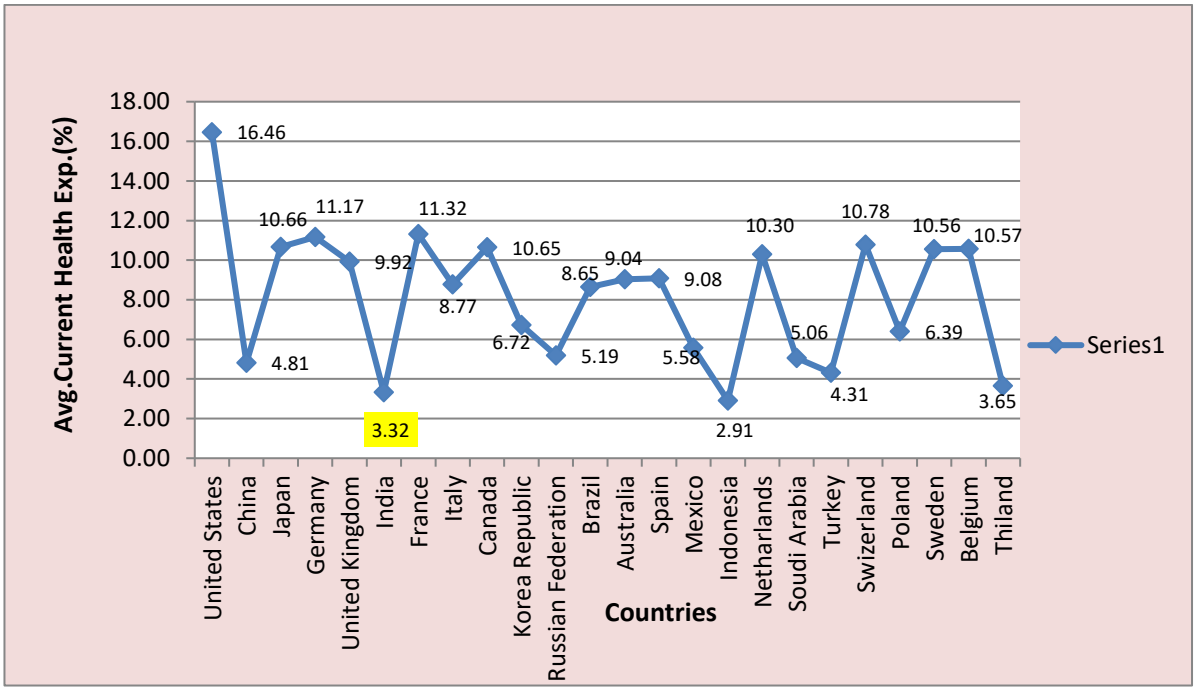


Figure 4.1.6.2

Average Annual Growth Rate In Current Health Expenditure(As % of GDP) 2010-2019

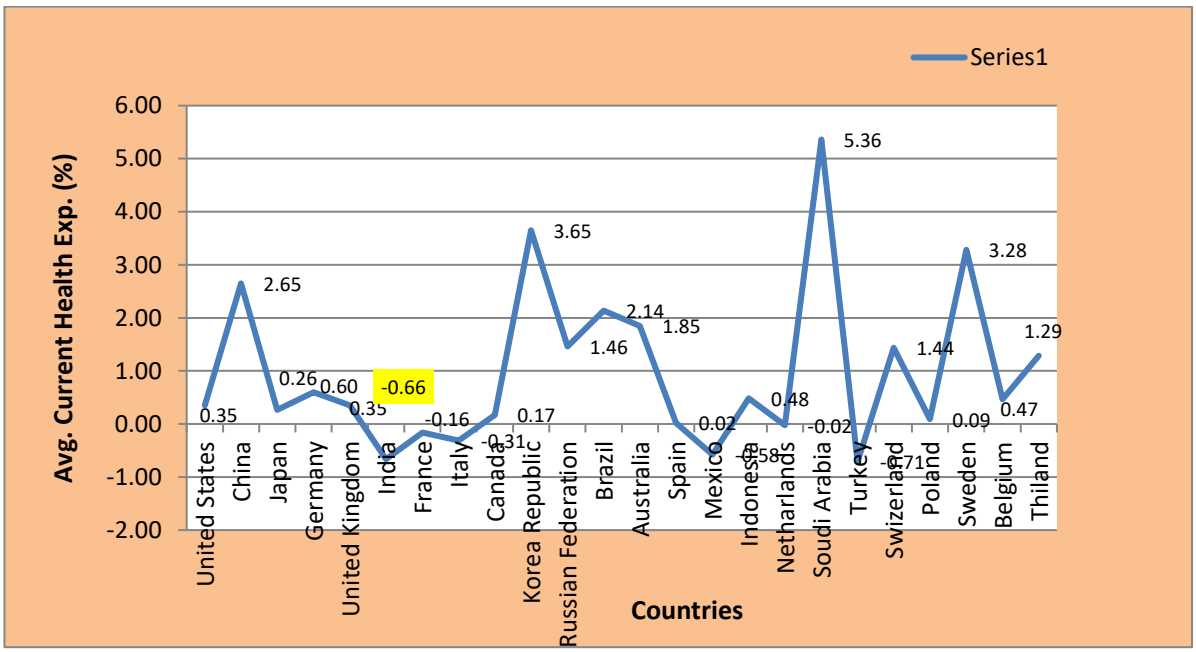


Table 4.1.6.6
Average Health Expenditure Per Capita in US$ (2010-2019)

SL NO.	COUNTRIES	Average Health Expenditure Per Capita In (US$) 2010-19 (Highest to Lowest value)
1	**Switzerland**	9263.41
2	**United States**	9247.86
3	**Sweden**	5911.79
4	**Australia**	5424.29
5	**Netherlands**	5221.04
6	**Canada**	5079.81
7	**Germany**	5016.72
8	**Belgium**	4791.25
9	**France**	4605.53
10	**Japan**	4344.00
11	**United Kingdom**	4246.25
12	**Italy**	3009.12
13	**Spain**	2630.32
14	**Korea Republic**	1942.33
15	**Saudi Arabia**	1134.52
16	**Brazil**	912.77
17	**Poland**	879.96
18	**Russian Federation**	635.56
19	**Mexico**	550.94
20	**Turkey**	482.11
21	**China**	364.88
22	**Thailand**	227.43
23	**Indonesia**	105.95
24	**India**	55.70

Table-4.1.6.7
Average Annual Growth Rate of Health Expenditure Per Capita (%) 2010-19

SL No.	COUNTRIES	AAGR (%) (Highest to Lowest)
1	**China**	12.64
2	**Saudi Arabia**	7.67
3	**Korea Republic**	7.60
4	**Thailand**	6.33
5	**India**	4.03
6	**Indonesia**	3.99
7	**Sweden**	3.81
8	**United States**	3.69
9	**Russian Federation**	3.04
10	**Poland**	2.79
11	**Switzerland**	2.73
12	**Germany**	2.10
13	**Japan**	1.42
14	**Australia**	1.36
15	**United Kingdom**	1.28
16	**Belgium**	1.26
17	**Netherlands**	0.57
18	**Mexico**	0.39
19	**Brazil**	0.14
20	**Canada**	0.09
21	**France**	0.01
22	**Spain**	-0.08
23	**Italy**	-0.89
24	**Turkey**	-3.16

The computed data of average annual health expenditure as % of GDP from 2010 to 2019 (Table - 4.1.6.4 and Figure 4.1.6.1) reflects that USA ranks first with the highest value 16.458. France, Germany and Switzerland rank as 2nd , 3rd and 4th highest countries respectively. Indonesia holds the lowest position having value (2.913) in average annual health expenditure (% of GDP) from 2010 to 2019. India stands as the 2nd lowest country. The avg. health expenditures (2010-19) of five countries, China, Turkey, Thailand , India and Indonesia are below 5% (4.814, 4.311,3.648,3.322 and 2.913 respectively).

Figure 4.1.6.3

Average Annual Health Expenditure (Per Capita In US$) from 2010 to 2019

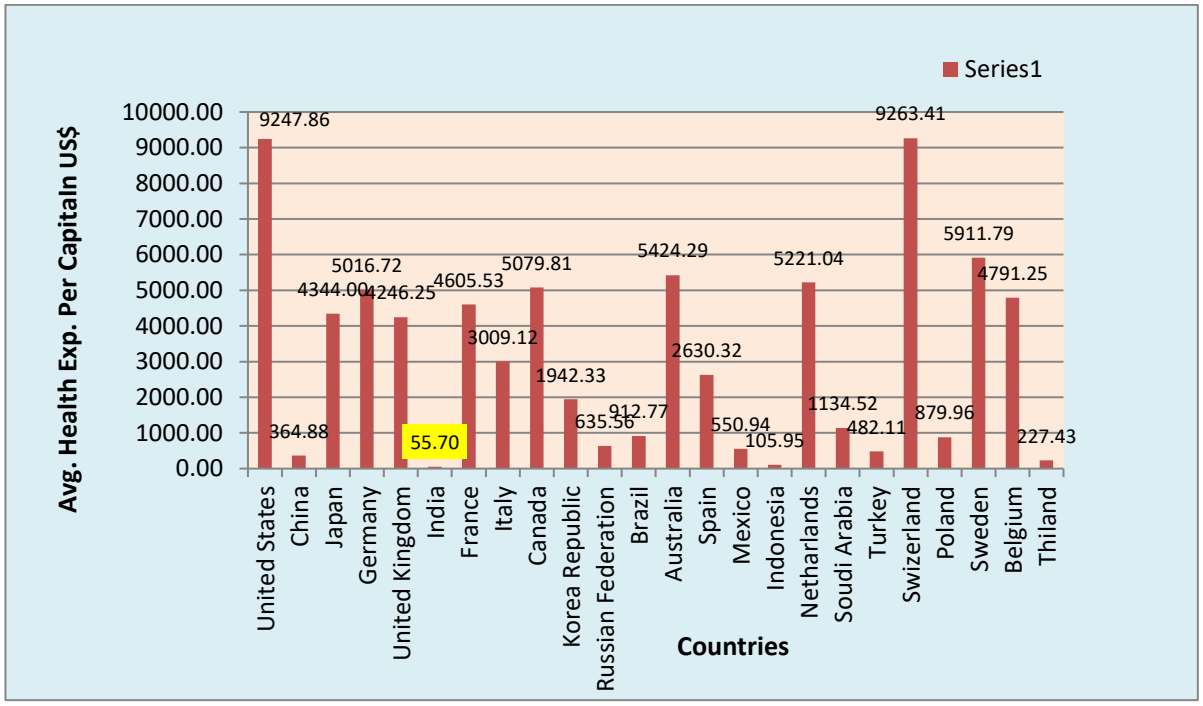


Figure 4.1.6.4

Average Annual Growth Rate In Per-Capita Health Expenditure from 2010 to 2019 in (%)

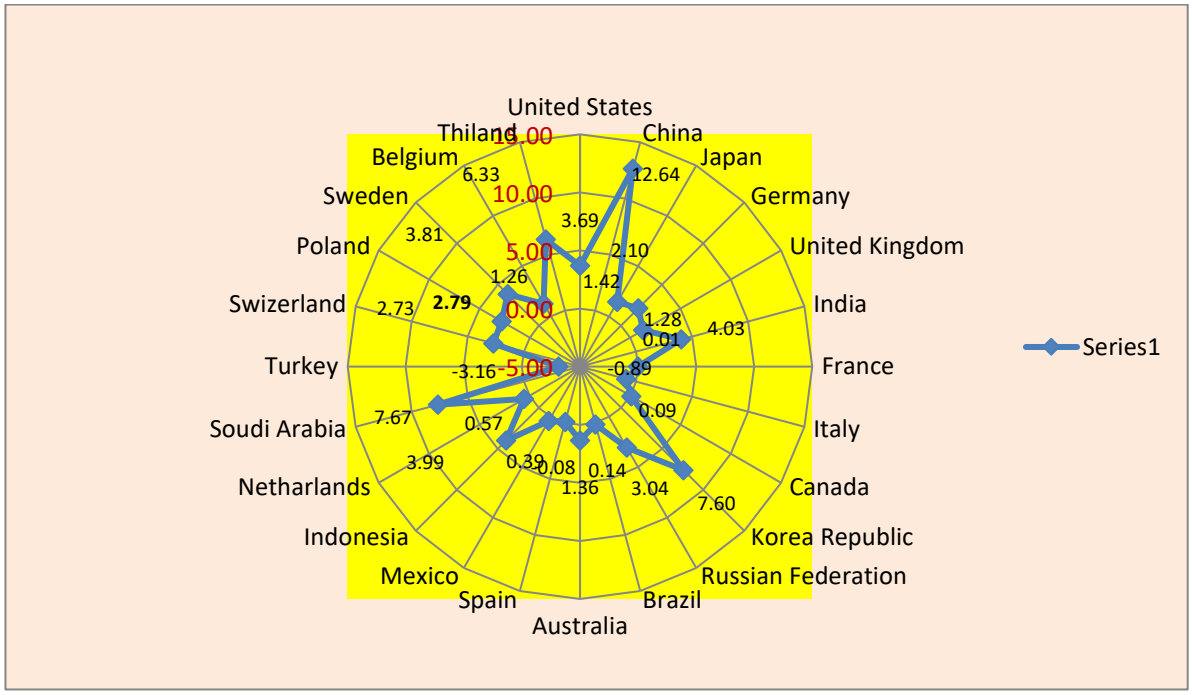


Table 4.1.6.8
Average GGHE-D (%CHE)
2010-19

SL NO.	COUNTRIES	Average Of Domestic General Government Health Expenditure (Highest to Lowest Value)
1	Sweden	84.21
2	Japan	83.80
3	United Kingdom	80.52
4	Turkey	78.16
5	Germany	76.62
6	Belgium	76.59
7	Italy	75.27
8	Thailand	73.67
9	France	72.55
10	Spain	71.55
11	Australia	71.35
12	Poland	70.19
13	Canada	70.17
14	Saudi Arabia	68.78
15	Netherlands	66.96
16	Russian Federation	60.53
17	Korea Republic	58.15
18	China	56.42
19	Mexico	51.48
20	United States	50.34
21	Brazil	43.13
22	Indonesia	36.47
23	Switzerland	32.16
24	India	28.30

Table 4.1.6.9
Average Annual Growth Rate Of GGHE-D (%CHE) 2010-19

SL NO.	COUNTRIES	Average Annual Growth Of Domestic General Government Health Expenditure (Highest to Lowest Value)
1	**Indonesia**	8.62
2	**India**	3.29
3	**Saudi Arabia**	1.29
4	**China**	0.88
5	**France**	0.73
6	**United States**	0.60
7	**Sweden**	0.35
8	**Japan**	0.26
9	**Australia**	0.25
10	**Germany**	0.22
11	**Korea Republic**	0.04
12	**Poland**	0.01
13	**Russian Federation**	0.00
14	**Canada**	-0.02
15	**Belgium**	-0.03
16	**Turkey**	-0.04
17	**Switzerland**	-0.06
18	**United Kingdom**	-0.09
19	**Mexico**	-0.21
20	**Thailand**	-0.21
21	**Netherlands**	-0.41
22	**Spain**	-0.58
23	**Italy**	-0.68
24	**Brazil**	-1.09

Figure 4.1.6.5

Average Domestic General Government Health Expenditure (% CHE)(2010-2019)

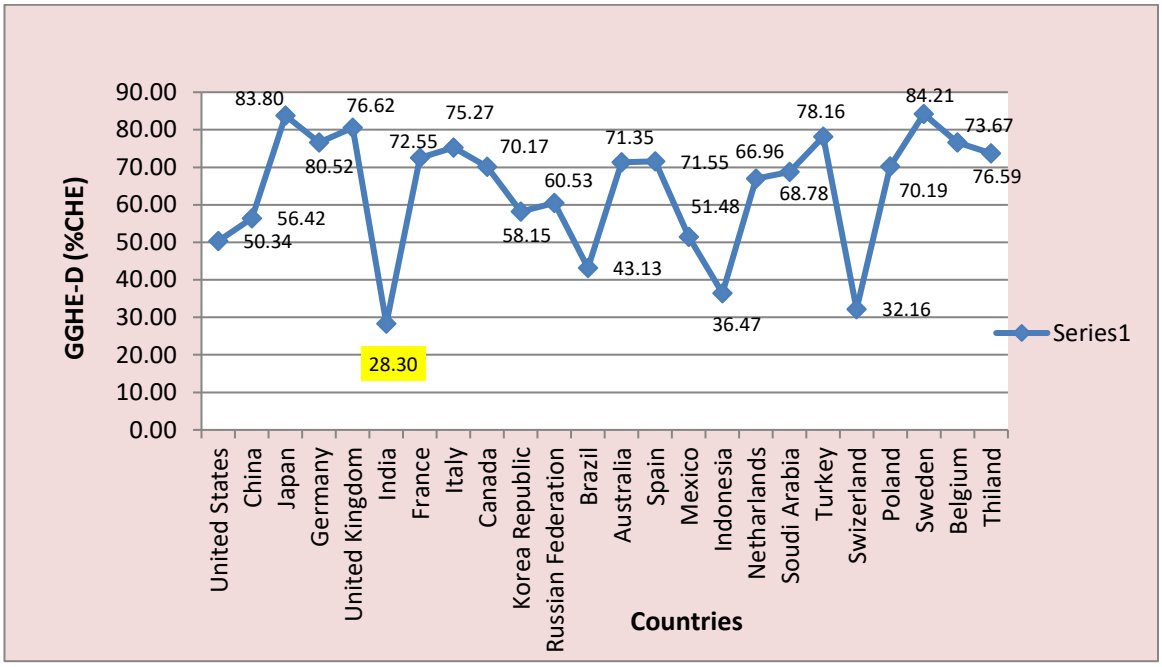
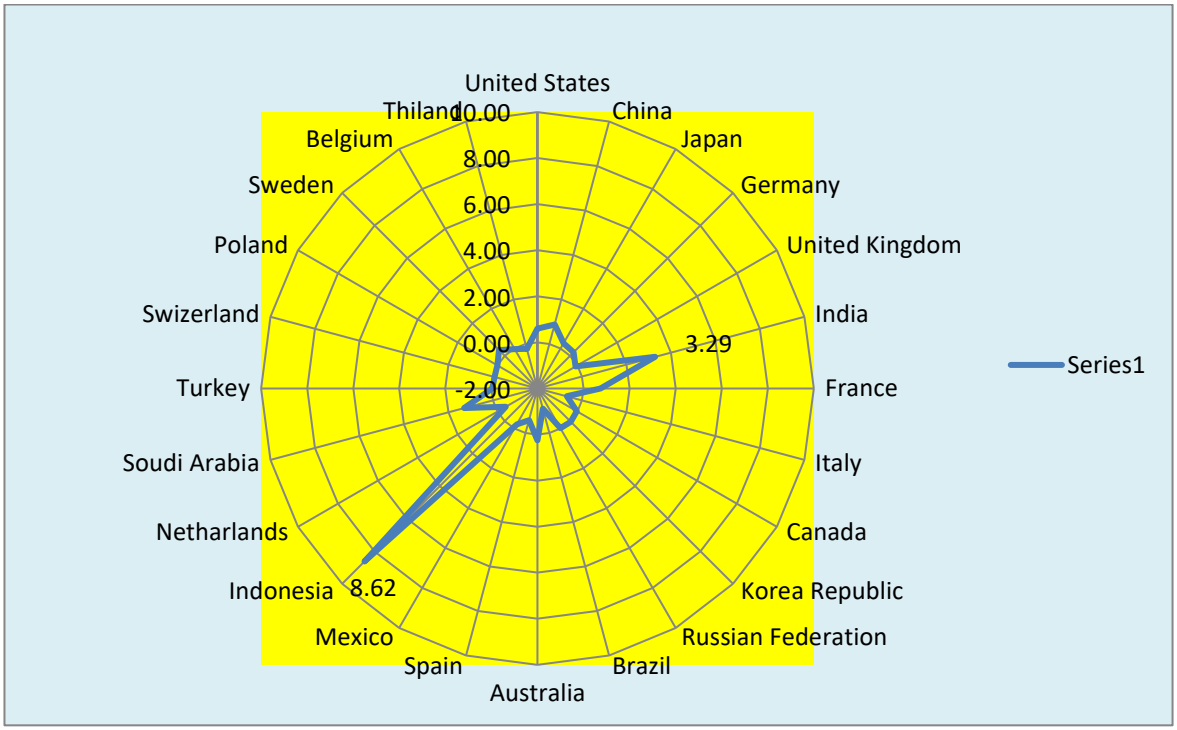


Figure 4.1.6.6

AAGR in Domestic General Government Health Expenditure (2010-2019)(%)



Computed data (Table-4.1.6.5 and Figure 4.1.6.2) reveals that the highest average annual growth rate (from 2010-2019) is found in Saudi Arabia having value 5.36 %. Germany, Indonesia, Belgium, USA, United Kingdom, Japan, Canada, Poland and Spain show the very poor growth less than 1%. For Netherlands, France, Italy, Mexico, India and Turkey negative growths are noticed i.e. decreasing tendency in % of average annual health expenditures from 2010 to 2019 are observed. Highest negative AAGR is noticed for Turkey (-0.71%) (the lowest performer) and 2nd highest negative average annual growth rate is observed in India (-0.66 %) from 2010 to 2019.

Switzerland possesses the highest rank in average annual health expenditure per capita in US$ from 2010 to 2019 having value 9263.41 but China holds the highest rank in % of average annual growth in health expenditure per capita among all the selected countries from 2010 to 2019 having value 12.64 (Table 4.1.6.6 -4.1.6.7).

Sweden stands as the highest country having values 84.21% in Domestic General Government Health Expenditure (% of CHE), Japan, United Kingdom & Turkey rank as 2nd, 3rd and 4th highest countries with values 83.80 %, 80.52 %, and 78.16 % respectively. India ranks as the lowest country in GGHE-D (%CHE) with a poor value 28.30%. Switzerland, Indonesia & Brazil stand as 2nd, 3rd and 4th lowest countries having values 32.16%, 36.47% and 43.13%. Indonesia possesses the highest rank having values 8.62% in average annual growth rate in GGHE-D (% of CHE) from 2010-2016 and, India and Saudi Arabia rank as the 2nd and 3rd highest country with value 3.29% and 1.29% in GGHE-D (Table 4.1.6.8 - 4.1.6.9) (Figure 4.1.6.5 - 4.1.6.6).

India holds the 2nd lowest position (value 3.32) in avg. annual health expenditure (% of GDP) from 2010-19, having an average annual negative growth rate -0.66 % (2nd Lowest among 24 countries)(Table 2.6.4 and 2.6.5). India ranks as the lowest country in average health expenditure per capita (In US$) having the poorest value 55.70 US$ among all the selected country from 2010 to 2019, but ranks as 5th highest country in respect of average annual growth rate (%) in per capita health expenditure from 2010-2016 contributing the growth 4.03 % (Table 4.1.6.6 and 4.1.6.7). India also ranks as the lowest country having average Domestic General Government Health Expenditure (as % of Current Health exp.) 28.30 %, with an annual growth rate of GGHE-D 3.29 % (Stands as the 2nd highest) among all the selected countries from 2010 to 2019 (Table 4.1.6.8 and 4.1.6.9).

4.1.7 Out of Pocket Expenditure:

Table 4.1.7.1

Out-Of-Pocket Expenditure as Percentage of Current Health Expenditure (%)

Out-Of-Pocket Expenditure as Percentage of Current Health Expenditure (CHE) (%), Last updated by WHO 15-12-2021										
COUNTRIES	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**	**YEAR**
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
United States	12.36	12.32	12.33	12.25	11.93	11.74	11.63	11.4	11.3	11.31
China	40.8	40.27	39.23	38.16	36.56	35.09	35.91	36.05	35.75	35.23
Japan	14.57	13.12	12.97	12.7	12.87	12.95	12.85	12.65	12.99	12.91
Germany	13.96	14	14.17	13.31	13	13.08	12.99	12.78	12.84	12.82
United Kingdom	13.59	13.84	14.56	15.97	15.93	16.08	16.29	16.74	17	17.07
India	65.18	62.22	63	69.07	67.01	64.66	63.21	55.11	55.32	54.78
France	10.24	10.24	10.12	9.95	9.87	9.72	9.58	9.59	9.32	9.26
Italy	20.55	22.03	22.08	22.23	22.54	23.47	23.32	23.81	23.57	23.31
Canada	15.49	15.07	14.87	14.5	14.6	14.61	15.47	15.28	14.99	14.91
Korea Republic	34.02	34.14	34.55	34.22	33.86	33.6	33.03	32.63	32.5	30.25
Russian Federation	35.33	34.19	33.4	34.83	35.83	38.65	40.48	40.49	38.31	36.57
Brazil	29.39	29.3	29.68	28.18	28.18	24.71	24.42	24.47	24.83	24.88
Australia	19.17	19.93	19.93	19.5	19.4	18.74	18.46	18.01	17.82	15.98
Spain	20.29	20.39	21.81	22.77	23.14	22.3	21.96	22.23	22.25	21.81
Mexico	43.51	40.73	40.64	39.88	40.87	41.04	41.37	41.79	42.26	42.12
Indonesia	60.58	56.22	53.62	50.9	45.25	43.05	38.52	36.6	35.64	34.76
Netherlands	9.1	9.48	10.09	11.53	11.59	11.29	11.28	11.05	10.8	10.58
Saudi Arabia	18.95	15.62	15.16	14.36	13.14	14.38	15.71	14.32	15.9	16.5
Turkey	16.87	15.9	15.93	16.93	17.73	16.95	16.47	17.38	17.49	16.89
Switzerland	26.19	25.65	25.87	25.16	26.04	25.86	26.57	26.41	27.98	25.29
Poland	23.87	23.96	24.27	23.8	23.01	23.31	23.08	23.06	20.79	20.44
Sweden	16.38	14.55	14.81	14.93	14.92	14.9	14.49	14.09	13.96	13.88
Belgium	19.95	19.69	19.36	19.61	19.33	19.34	18.01	17.8	18.24	18.17
Thailand	14.5	13.01	13.42	12.54	12.86	12.51	11.35	11.87	10.25	8.67

Table 4.1.7.2
Average Annual Out Of Pocket Expenditure (As % of CHE) from 2010-2019

SL No.	COUNTRIES	AVG. OOPE (% of total HE) 2010-19 (Highest to lowest value)
1	**India**	61.96
2	**Indonesia**	45.51
3	**Mexico**	41.42
4	**China**	37.31
5	**Russian Federation**	36.81
6	**Korea Republic**	33.28
7	**Brazil**	26.80
8	**Switzerland**	26.10
9	**Poland**	22.96
10	**Italy**	22.69
11	**Spain**	21.90
12	**Belgium**	18.95
13	**Australia**	18.69
14	**Turkey**	16.85
15	**United Kingdom**	15.71
16	**Saudi Arabia**	15.40
17	**Canada**	14.98
18	**Sweden**	14.69
19	**Germany**	13.30
20	**Japan**	13.06
21	**Thailand**	12.10
22	**United States**	11.86
23	**Netherlands**	10.68
24	**France**	9.79

Table-4.1.7.3
AARR in Out Of Pocket Expenditure (As % CHE) from 2010-2019

SL No.	COUNTRIES	Avg. Annual Rate of Reduction in OOPE (%) (2010-19) (Highest to Lowest value)
1	**Indonesia**	5.94
2	**Thailand**	5.29
3	**Australia**	1.94
4	**India**	1.75
5	**Sweden**	1.75
6	**Brazil**	1.74
7	**Poland**	1.65
8	**China**	1.60
9	**Japan**	1.27
10	**Korea Republic**	1.27
11	**France**	1.11
12	**Saudi Arabia**	1.07
13	**Belgium**	1.00
14	**United States**	0.98
15	**Germany**	0.92
16	**Canada**	0.39
17	**Mexico**	0.33
18	**Switzerland**	0.30
19	**Turkey**	-0.10
20	**Russian Federation**	-0.48
21	**Spain**	-0.85
22	**Italy**	-1.44
23	**Netherlands**	-1.82
24	**United Kingdom**	-2.61

Figure 4.1.7.1

Average Annual Out of Pocket Expenditure (%CHE) 2010-2019

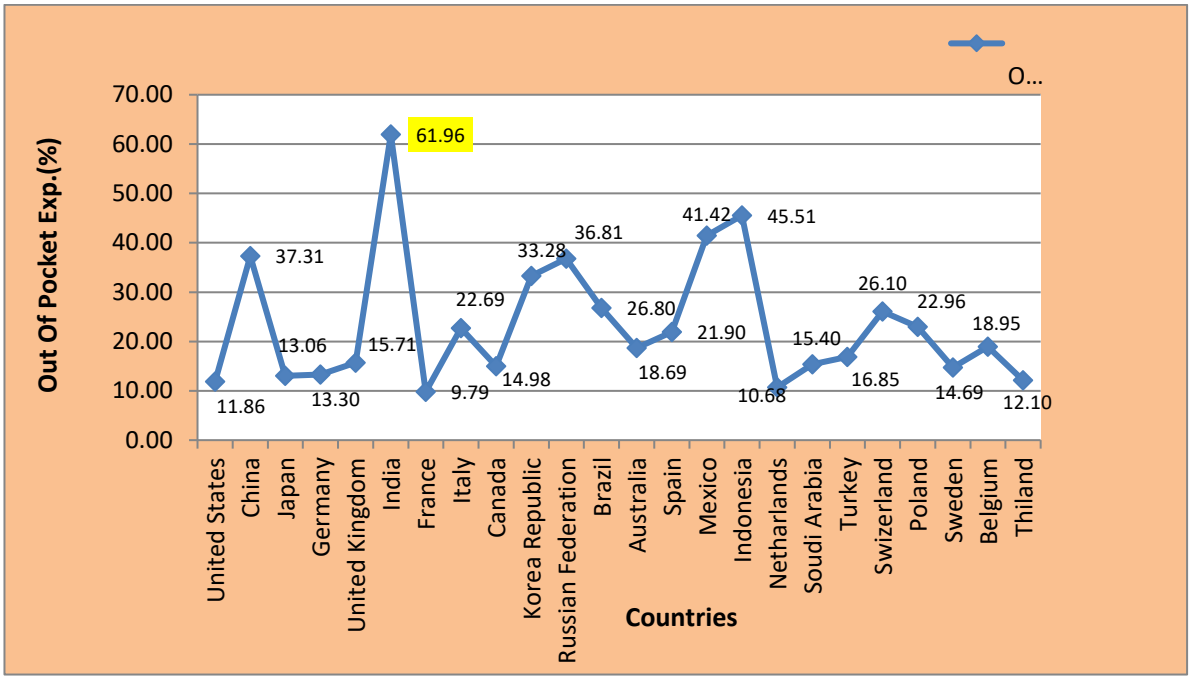


Figure 4.1.7.2

Average Annual Rate of Reduction in Out of Pocket Expenditure (%CHE) 2010-2019

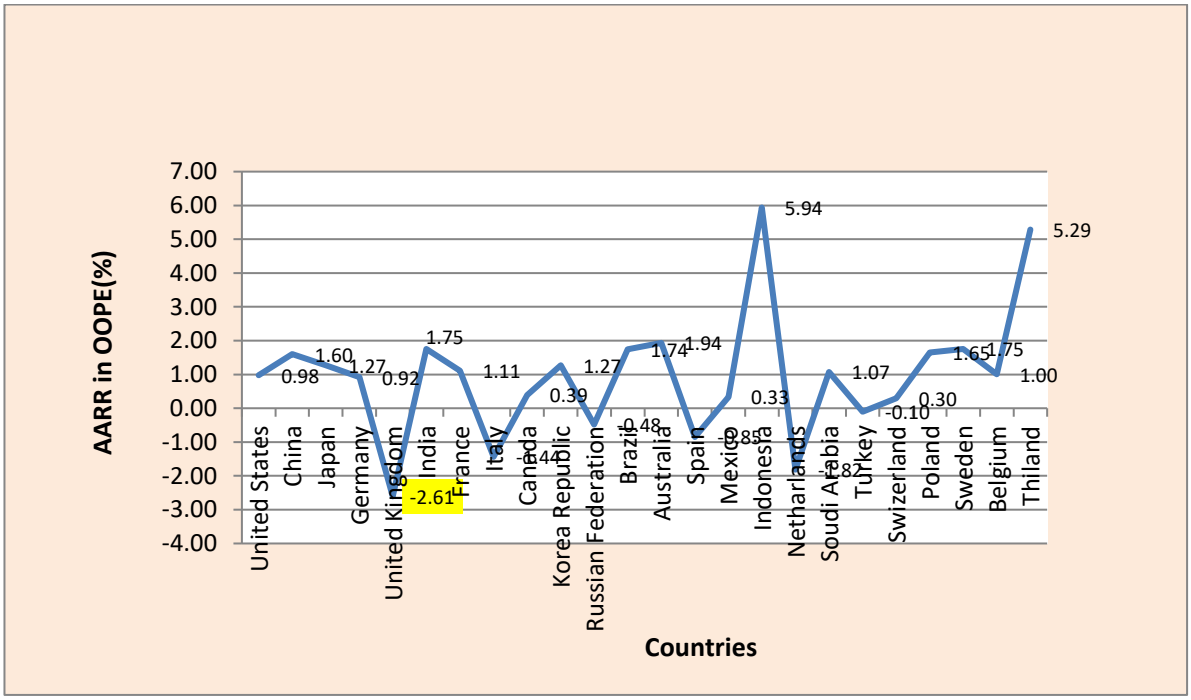


Table 4.1.7.4

Proportion of Population Spending more than 10% and 25 % of their Household Consumption or Income on Out Of Pocket Health Care Expenditure in World (%)

Proportion of Population Spending More Than 10% Of Their Household Consumption Or Income On Out Of Pocket Health Care Expenditure In World (%)				
YEAR	2010	2015	2017	2019
VALUE IN %	11.38	12.65	13.02	13.46
Proportion of Population Spending More Than 25% of Their Household Consumption Or Income On Out Of Pocket Health Care Expenditure In World (%)				
YEAR	2010	2015	2017	2019
VALUE IN %	2.72	3.3	3.63	3.77
Source: WHO, data Last updated on 04.05.2023				

Table 4.1.7.5

Proportion Of Population Spending more than 10% & 25% of their Household Consumption or Income on Out Of Pocket Health Care Expenditure in India (%)

Proportion of Population Spending More Than 10% of Their Household Consumption or Income on Out Of Pocket Health Care Expenditure In India (%)		
YEAR	2011	2017
VALUE IN %	17.9	17.5
Proportion of Population Spending More Than 25% Of Their Household Consumption or Income on Out Of Pocket Health Care Expenditure In India (%)		
YEAR	2011	2017
VALUE IN %	4.55	6.67
Source: WHO & WORLD BANK(Retrieved on 26.08. 2023)		

From 2010 to 2019, India's average OOPE is highest among all the 24 selected countries having value 61.96. Indonesia and Mexico stand for 2nd and 3rd highest position in average OOPE (2010-2019) having values 45.51 and 41.42 respectively. Average OOPE for Thailand (Stands for 4th lowest country) from 2010 to 2019 is only 12.10. France achieved the lowest average OOPE from 2010 to 2019 among all the selected countries having value 9.79. Netherland and United States stand for 2nd and 3rd lowest countries in average OOPE (2010-2019) with values 10.68 and 11.86 respectively.(Table-4.1.7.2)

Average Annual Reduction Rate in OOPE from 2010 to 2019 is found in most of the selected countries except the five countries, United Kingdom, Netherlands, Italy, Spain and Russian Federation which show increasing tendencies (Table-4.1.7.3). Indonesia achieved the highest progress in AARR in OOPE from 2010-2019 having scores 5.94 (%). Thailand (ranks 2nd highest) is also

achieved much accelerated tendency in minimizing the OOPE having values 5.29. Australia, India , Sweden, Brazil, Poland, China, Japan, Korea Republic, France, Saudi Arabia and Belgium achieved less than 2 (%) of avg. annual rate of reduction in OOPE from 2010-19 and United States , Germany, Canada, Mexico and Switzerland have 1% of avg. annual reduction of OOPE. United Kingdom holds the lowest rank in average annual reduction in OOPE from 2010-19 among selected 24 countries having negative values -2.6.

In India, percentages of population spending more than 10% of their household consumption or Income on Out of Pocket expenditure was 17.9 and 17.5 in the year 2011 and 2017 respectively. Proportion of population spending more than 25% of their household consumption or income on out of pocket expenditure in India was 4.55 and 6.67 in the year 2011 and 2017 respectively. Increasing tendencies are clear based on initial year values and final year values in the table for proportion of population spending more than 25% of household consumption or income on Out of Pocket expenditure (Table 4.1.7.5) and also both the values for India are higher than the Global Avg. values. From 2010 to 2019 Global increasing is observed for both the cases (11.38% to 1346% and 2.72% to 3.77% respectively) (Table 4.1.7.4).

Table 4.1.7.6

Correlation among Health Indicators and CHE,GGHE-D and OOPE

Correlation coefficient (PEARSON) (r) among Health Indicators and CHE, GGHE-D and OOPE				
(r)	Current Health Exp. (% of GDP)	Domestic General Government Health Expenditure (% of CHE)	Out of Pocket Expenditure (%CHE)	
				Table values
Avg. IPA (11-17 Yrs.) (2010-16)	-0.163	0.056	0.075	0.423 (N=22, Df= 20, level of sig. 0.05)
Prevalence of IPA (ADULT) (2016)	0.276	0.107	-0.261	0.404 (N=24, Df= 22, level of sig. 0.05)
Avg. NCD Death (2010-19)	-0.279	**-0.405***	**0.549***	0.404 (N=24, Df= 22, level of sig. 0.05)
Avg. under Five Mortality (2010-19	**-0.0607***	**-0.0682***	**0.79***	0.404 (N=24, Df= 22, level of sig. 0.05)
Avg. Children Mortality Rate (5-14 Yrs.) (2010-19)	**-0.723***	**-0.585***	**0.701***	0.404 (N=24, Df= 22, level of sig. 0.05)
Avg. Adult Mortality (15-60 yrs.) (2010-16)	**-0.606***	**-0.516***	**0.617***	0.404 (N=24, Df= 22, level of sig. 0.05)
HALE at Birth (2019)	**0.563***	**0.5598***	**-0.6009***	0.404 (N=24, Df= 22, level of sig. 0.05)
HALE at 60 Yrs. (2019)	**0.616***	**0.499***	**-0.6021***	0.404 (N=24, Df= 22, level of sig. 0.05)
Avg. Stunting U-5 yrs. (2010-2019)	**-0.6208***	**-0.72***	**0.809***	0.5139 N=15, Df 13, level of sig. 0.05)
Avg. Underweight(5-19 yrs.) 2010-2016	**-0.592***	**-0.533***	**0.682***	0.404 (N=24, Df= 22, level of sig. 0.05)
Avg. underweight (20 Yrs. and older) 2010-16	**-0.5271***	**-0.575***	**0.715***	0.404 (N=24, Df= 22, level of sig. 0.05)
Avg. Overweight U-5 yrs. 2010-2019	0.0167	0.0163	-0.15	0.497 (N=16, Df =14, Level of sig. 0.05)
Avg. Overweight (5-19 yrs.) 2010-2016)	**0.476***	0.354	**-0.537***	0.404 (N=24, Df= 22, level of sig. 0.05)
Avg. Overweight(Adult) 2010-2016)	**0.465***	0.38	**-0.56***	0.404 (N=24, Df= 22, level of sig. 0.05)

(*) denotes significant relationship.

Details of the findings are stated elaborately in respective section of Health Indicators.

4.1.8 Sustainable Development Goal Index Score:

Table 4.1.8.1

SDG Index Score from 2010 to 2021

COUNTRIES	Year Wise SDG-Index Score											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
United States	73.12	73.45	73.6	73.69	73.99	74	74.21	74.2	74.11	74.4	74.5	74.5
China	65.32	66.12	67.1	68.11	68.97	69.5	69.93	70.6	71.48	72	72.3	72.4
Japan	77.72	77.97	78	78	78.02	78.4	78.34	78.6	79.15	79.3	79.5	79.6
Germany	79.04	79.23	79.5	79.92	80.35	81.6	81.94	81.9	81.87	81.9	82.3	82.2
United Kingdom	78.63	79.2	79.4	79.47	79.8	80.4	80.69	81	80.97	80.9	81	80.5
India	53.63	54.16	54.4	55.14	55.88	56.4	57.23	59.1	59.71	60.4	60.1	60
France	78.09	77.94	78.9	79.08	79.32	79.5	79.61	80.5	80.75	81.1	81.2	81.2
Italy	75.69	75.71	76.6	77.34	77.15	77.1	77.25	77.3	78.07	77.9	78.5	78.3
Canada	76.54	76.71	76.9	76.86	77	77.2	77.39	77.5	77.6	77.7	77.8	77.7
Korea Republic	76.12	76.06	76.5	76.38	76.39	76.9	77.01	76.8	77.41	77.4	77.7	77.9
Russian Federation	68.9	69.28	69.1	69.58	70.71	71.3	71.63	72.8	73.11	73.7	74.1	74.1
Brazil	70.29	70.18	70.6	71.15	71.73	72.5	71.42	72	72.39	72.7	72.6	72.8
Australia	73.42	73.56	73.9	74.96	74.76	75.1	75.35	75.6	75.36	75.5	75.5	75.6
Spain	76.79	76.54	76.8	77.07	77.96	77.8	78.42	78.2	78.92	79.4	79.7	79.8
Mexico	65.91	65.73	66.8	66.92	67.22	67.4	68.29	68.9	70.21	70.3	70.1	70.2
Indonesia	61.72	61.9	62.8	63.32	64.16	65	65.19	66.9	68.12	68.4	68.5	68.9
Netherlands	78.26	78.64	78.6	78.67	78.87	79.6	79.44	79.6	79.68	79.7	80	79.8
Saudi Arabia	60.01	60.29	60.4	61.14	62.07	62	62.51	64.2	64.68	65.5	65.8	66.4
Turkey	68.37	68.2	68.7	69.07	68.86	69	68.55	69.2	70.16	70.4	70.6	70.4
Switzerland	78.46	79.03	79.4	79.44	79.99	80.5	80.25	80.4	80.27	80.5	80.6	80.7
Poland	76.11	76.3	77	76.87	78	78.7	79.38	80.6	80.2	80.6	80.2	80.5
Sweden	84.77	84.89	85.3	85.16	85.22	85.3	85.15	85.2	85.06	85.1	85.3	85.2
Belgium	77.17	77.4	78.3	78.17	78.52	78.6	78.97	78.9	79.09	79.5	79.7	79.7
Thailand	71.05	71.78	71.2	71.73	72.32	72.9	72.98	73.1	73.69	74.2	74.1	74.1

Source: Sustainable Development Report, 2022. https://sustainabledevelopment.report

Table 4.1.8.2
Average SDG Scores from 2010-2021

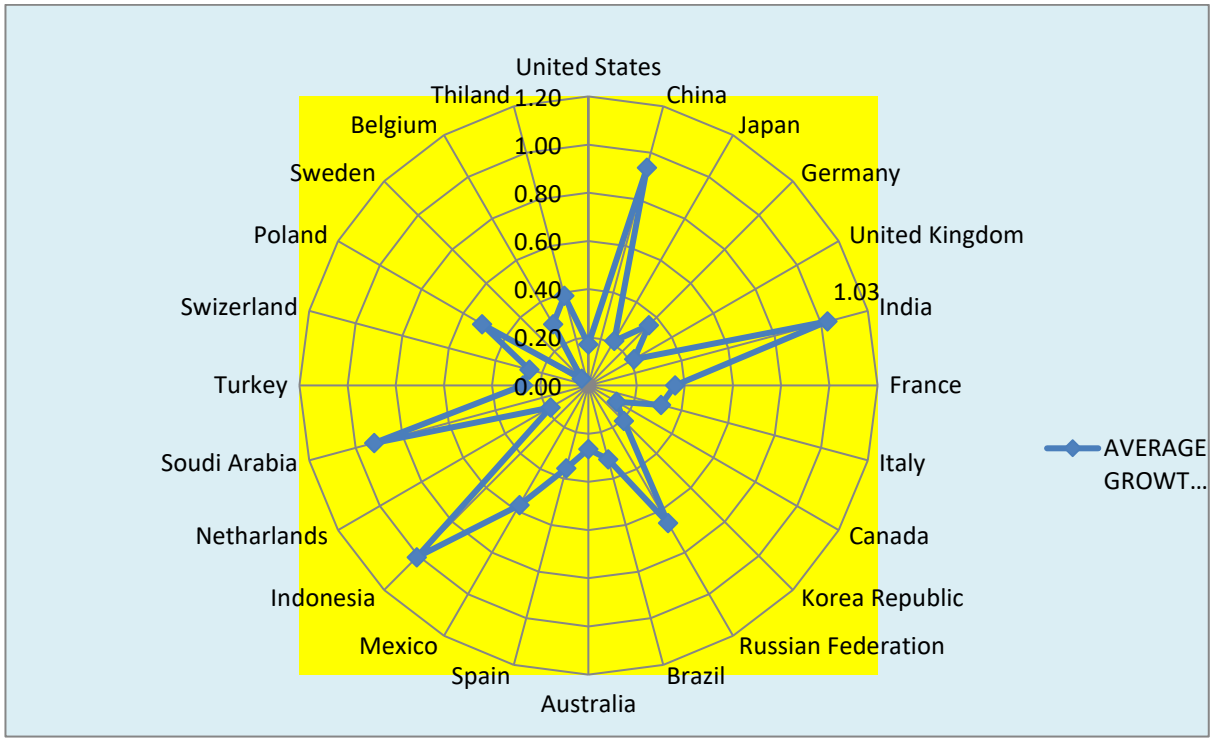
SL. No.	Countries	Avg. SDG Scores from 2010 to 2021
1	**Sweden**	85.14
2	**Germany**	80.98
3	**United Kingdom**	80.16
4	**Switzerland**	79.97
5	**France**	79.76
6	**Netherlands**	79.24
7	**Poland**	78.70
8	**Belgium**	78.66
9	**Japan**	78.54
10	**Spain**	78.11
11	**Italy**	77.24
12	**Canada**	77.23
13	**Korea Republic**	76.87
14	**Australia**	74.87
15	**United States**	73.98
16	**Thailand**	72.76
17	**Brazil**	71.68
18	**Russian Federation**	71.51
19	**China**	69.47
20	**Turkey**	69.29
21	**Mexico**	68.17
22	**Indonesia**	65.41
23	**Saudi Arabia**	62.91
24	**India**	57.18

Table 4.1.8.3
Average Annual Growth Rate in SDG Scores from 2010 to 2021

SL. No.	Countries	Avg. annual Growth % from 2010 to 2021
1	**India**	1.027
2	**Indonesia**	1.008
3	**China**	0.936
4	**Saudi Arabia**	0.921
5	**Russian Federation**	0.660
6	**Mexico**	0.573
7	**Poland**	0.510
8	**Thailand**	0.385
9	**France**	0.359
10	**Spain**	0.356
11	**Germany**	0.354
12	**Brazil**	0.317
13	**Italy**	0.311
14	**Belgium**	0.293
15	**Turkey**	0.272
16	**Australia**	0.264
17	**Switzerland**	0.254
18	**United Kingdom**	0.218
19	**Japan**	0.214
20	**Korea Republic**	0.208
21	**Netherlands**	0.182
22	**United States**	0.171
23	**Canada**	0.135
24	**Sweden**	0.041

Figure 4.1.8.1

Average Annual Growth Rate of SDG Score from 2010 to 2022 (%)



SDG score reflects the development in all aspects (including Health and wellbeing and education) of a country. Table 4.1.8.1 and 4.1.8.2 represents that India is the least developmental country in respect of achieving the Sustainable Development Goals having score 60.32 in 2022 and with an average annual SDG score (from 2010 to 2021) 57.18. The scores of China, Turkey, Mexico, Indonesia, Saudi Arabia and India are below 70. Sweden has achieved the highest SDG score 85.2 in 2021 with an average annual SDG score 85.14 (from 2010 to 2021). Germany and United Kingdom stand for 2nd and 3rd highest country having average annual SDG score from 2010-2021, 80.98 and 80.16 respectively, among the selected countries. In spite of having lowest SDG score India makes considerable progress having highest average annual growth rate (%) in SDG Scores from 2010 to 2021 among all the selected countries.

India's average annual Growth Rate in SDG Scores from 2010-2021 is highest (1.027%) among all selected countries. Indonesia and china scores score next, having average annual growth rate 1.008% and 0.936% respectively.

Table 4.1.8.4

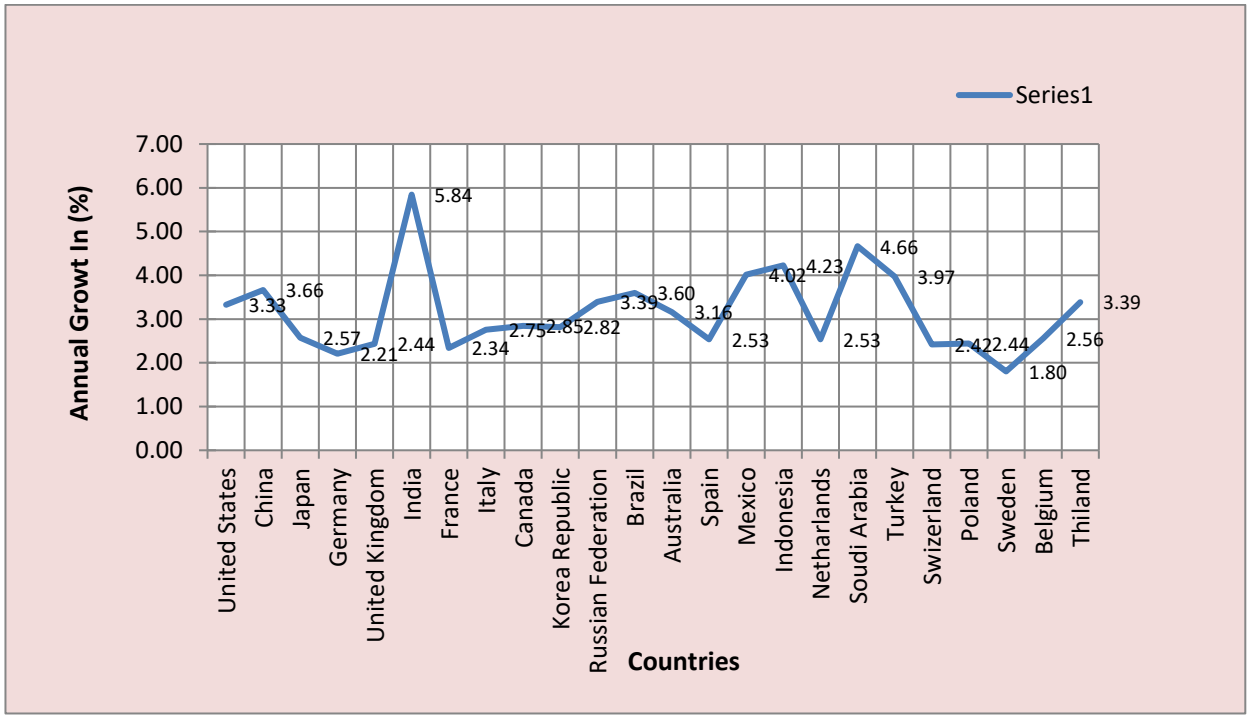
Required Annual SDG Growth to Reach the Score 100 By 2030 (in %)

Sl. No.	Countries	Average Annual Growth Rate in SDG Score (2010 - 2021) (%)	SDG Score In 2021	Probable SDG Score by 2030 (Based On Present Avg. Annual Growth.)	Required Annual SDG Growth to Reach The Score 100 By 2030 (In %)
1	**United States**	0.17	74.49	75.63	3.33
2	**China**	0.94	72.36	78.69	3.66
3	**Japan**	0.21	79.56	81.10	2.57
4	**Germany**	0.35	82.16	84.81	2.21
5	**United Kingdom**	0.22	80.53	82.12	2.44
6	**India**	1.03	59.98	65.76	5.84
7	**France**	0.36	81.22	83.88	2.34
8	**Italy**	0.31	78.31	80.53	2.75
9	**Canada**	0.13	77.68	78.63	2.85
10	**Korea Republic**	0.21	77.88	79.35	2.82
11	**Russian Federation**	0.66	74.06	78.58	3.39
12	**Brazil**	0.32	72.76	74.86	3.60
13	**Australia**	0.26	75.58	77.40	3.16
14	**Spain**	0.36	79.84	82.43	2.53
15	**Mexico**	0.57	70.16	73.86	4.02
16	**Indonesia**	1.01	68.9	75.41	4.23
17	**Netherlands**	0.18	79.83	81.14	2.53
18	**Saudi Arabia**	0.92	66.36	72.07	4.66
19	**Turkey**	0.27	70.43	72.17	3.97
20	**Switzerland**	0.25	80.67	82.53	2.42
21	**Poland**	0.51	80.47	84.24	2.44
22	**Sweden**	0.04	85.15	85.46	1.80
23	**Belgium**	0.29	79.68	81.80	2.56
24	**Thailand**	0.39	74.11	76.72	3.39

Data of Table 4.1.8.4 reflects the probable SDG scores by 2030 in column 5, based on average annual growth of SDG score (%) from 2010 to 2021 and based SDG scores of 2021. Column 6 of Table-4 reflects Required annual SDG growth rate based on the SDG scores in 2021 and targeted SDG scores for each country 100. In spite of having highest average annual growth rate (1.03%) India remains as the lowest scoring country (65.76) in predicted SDG Score by 2030 based on the average annual growth rate from 2010 to 2021.

Figure 4.1.8.2

Required Annual Growth to Achieve SDG Score 100 By 2030 In (%)



The formula adopted for computing Predicted SDG score:-

$P(SDGS_{2030}) = \{ (CSDGS_{2021}) \ (1+ AASDGS\%_{(2010\text{-}2021)} /100)^{9}\}$.

*$P(SDGS_{2030})$=Predicted Sustainable Development Goal Score by 2030 * $(CSDGS_{2021})$ = Countries' Sustainable Development Goal Score in 2021, * $AAGRSDGS\%_{(2010\text{-}2021)}$ =Average Annual Growth Rate in Sustainable Development Goal Score from 2010 to 2021.

The formula adopted for computing Required Annual Growth in (%):

$RAGR_{(2021\text{-}2030)}(\%)= [\{(100/ CSDGS_{2021})^{1/9} -1\}*100]$

*$RAGR_{(2021\text{-}2030)}$= Required Annual Growth Rate from 2021 to 2030.

*$CSDGS_{2021}$ = Countries' Sustainable Development Goal Score in 2021.

4.1.9 India's Relative Dis-advancement in Health Indicators in Brief

Table 4.1.9.1

India's Relative Dis-advancement (Rank with values among selected countries)

SL NO.	Indicators	Both sex (Rank)	Male (Rank)	Female (Rank)	Year/ Duration	Remarks
1	Prevalence of Insufficient Physical Activity among adult (18+ yrs.)(%)	10th Highest (34.03)	-	6th Highest (43.89)	2016	Ranks done among 24 countries
2	Total NCD Death	2nd Highest (4828004)	2nd Highest (2782104)	2nd Highest (2045900)	2010	II
3	Total NCD Death	2nd Highest (6046960)	2nd Highest (3339492)	2nd Highest (2707468)	2019	II
4	Avg. annual NCD Death	2nd highest (5443289)	2nd highest (2489658)	2nd highest (1971766)	2010 to 2019	II
5	Avg. annual Growth Rate in total NCD Death	5th highest (2.535%)	8th highest (2.055%)	highest (3.165%)	2010 to 2019	II
6	UNDER FIVE Children Mortality rate /1000	Highest(58.1)			2010	II
7	UNDER FIVE Children Mortality rate /1000	Highest(30.62)			2021	II
8	AVG. ANNUAL UNDER FIVE Children Mortality rate /1000	Highest (43.11)			2010-21	II
9	Children Mortality rate (5-14 Yrs.), /1000	Highest (9.03)			2010	II
10	Children Mortality rate (5-14 Yrs.) ,/1000	Highest (5.49)			2019	II

India's Relative Dis-advancement

SL NO.	Indicators	Both sex (Rank)	Male (Rank)	Female (Rank)	Year/ Duration	Remarks
11	AVG. annual Children Mortality rate (5-14 Yrs.)/1000	Highest (7.034)			2010 to 2019	Ranks done among 24 countries
12	Avg. annual Adult Mortality rate (15-60Yrs)/1000 population	2nd highest (185.91)	2nd highest (220.60)	2nd highest (147.66)	2010 to 2016	II
13	Healthy life expectancy at Birth(Yrs.)	Lowest (57.3)	2nd Lowest (57)	Lowest (57.6)	2010	II
14	Healthy life expectancy at Birth(Yrs.)	Lowest (59.1)	2nd Lowest (59.1)	Lowest (59.2)	2015	II
15	Healthy life expectancy at Birth(Yrs.)	Lowest (60.3)	Lowest (60.3)	Lowest (60.4)	2019	II
16	Healthy life expectancy at 60(Yrs.)	Lowest (12.57)	2nd Lowest (12.12)	Lowest (13.03)	2010	II
17	Healthy life expectancy at 60(Yrs.)	Lowest (13.06)	2nd Lowest (12.54)	Lowest (13.32)	2015	II
18	Healthy life expectancy at 60(Yrs.)	Lowest (13.25)	3rd Lowest (13.02)	Lowest (13.47)	2019	II
19	Growth Rate in Healthy life expectancy at 60 (Yrs.)	7^{TH} LOWEST (1.78 %)	7^{TH} LOWEST (2.09%)	9^{TH} LOWEST (1.51%)	2015 & 2019	II

India's Relative Dis-advancement

SL No.	Indicators	Both Sex (Rank)	Male (Rank)	Female (Rank)	Year/ Duration	Remarks
20	Average annual prevalence of stunting children under 5 yrs. age.	HIGHEST (37.59%)			2010 to 2020	Among 15 countries based on data availability.
21	Average % of prevalence of thinness among children & adolescent (5-19 yrs.), 2010-16 BMI< 18	Highest 27.11	Highest 31.27	Highest 22.49	2010 to 2016	Among selected 24 countries
22	AARR in prevalence of thinness among children and adolescent(5-19 yrs.) from 2010 to 2016	11^{TH} Highest 0.25	11^{TH} Highest 0.58	6^{TH} LOWEST -0.22	2010 to 2016	Among selected 24 countries
23	AAGR in overweight prevalence (bmi≥25) among children & adolescent(5-19 yrs.) 2010-2016 (in %)	HIGHEST 7.53	HIGHEST 8.25	HIGHEST 6.85	2010-2016	II
24	Average annual underweight prevalence among adult 20yrs & older, 2010-16 BMI< 18 (in %)	Highest 24.7	Highest 24.30	Highest 25.24	2010-2016	II
25	AAGR in overweight prevalence (bmi≥25) among adult (20 yrs. & older) 2010-2016	3^{rd} HIGHEST 3.00	3^{rd} HHIGHEST 3.36	3^{rd} HIGHEST 2.71	2010-2016	II

India's Relative Dis-advancement

SL No.	Indicators	Ranks	Year/ Duration	Remarks
26	Average health expenditure (2010-2019)	2nd Lowest (3.322%)	2010 to 2019	Among selected 24 countries
27	Percentage (%) of average annual growth in Health Expenditure	2nd Lowest (-0.66%)	2010 to 2019	II
28	Average annual Health Expenditure per capita in (US$)	Lowest 55.70	2010 to 2019	II
29	Average annual Domestic General Government Health Expenditure (%CHE)	Lowest (28.30%)	(2010 to 2019)	II
30	Average Out of Pocket Expenditure (% of CHE 2010-19)	Highest(61.96%)	2010 to 2019	II
31	Average annual SDG Scores from 2010-2021	Lowest (57.18)	2010 to 2021	II

4.1.10 India's Relative Advancement In Health Indicators In Brief

(Rank with value among selected countries).

Table 4.1.10.1

India's Relative Advancement

SL No.	Indicators	Both Sex	Male	Female	Year/ Duration	Remarks
1	**Avg. annual Prevalence in IPA (11-17 yrs.) in (%)**	**2nd Lowest (74.48)**	**5th Lowest (72.78)**	**Lowest (76.38)**	**2010 to 2016**	Among the 22 selected countries.
2	**Avg. Annual Rate of Reduction of IPA (11-17 yrs.) in (%).**	**3rd highest (0.25)**	**3rd highest (0.45)**	**2nd Highest (0.026)**	**2010 to 2016**	Among 24 counties
3	**Prevalence of Insufficient Physical Activity among adult (18+ yrs.)(%)**	-	**10th Lowest (24.7)**	-	**2016**	II
4	**AARR under Five Children Mortality in(%).**	**4th highest (5.66 %)**			**2010 to 2021**	II
5	**AARR in Children Mortality (5-14yrs.) (%)**	**2nd highest (5.38% & 39.20%)**			**2010 to 2019 & also between 2010 & 2019**	II
6	**AARR in Adult Mortality rate in Female (15-60 yrs.)**	**5th Highest (2.37%)**			**2010 to 2016**	II
7	**Growth Rate in Healthy Life Expectancy at Birth (Yrs.)**	**2nd highest (3.14%)**	**2nd highest (3.68%)**	**Highest (2.78%)**	**2010 & 2015**	II

India's Relative Advancement

SL No.	Indicators	Both Sex	Male	Female	Year/ Duration	Remarks
8	Growth Rate in healthy life expectancy at birth (yrs.)	2nd highest (2.03%)	2nd highest (2.03%)	Highest (2.03%)	2015 & 2019	Among the 24 selected countries.
9	Growth Rate in healthy life expectancy at 60 (yrs.)	5th highest (3.90%)	2nd highest (5.69%)	7thHighest (2.23%)	2010 & 2015	II
10	AARR of stunting among children under 5 yrs. Age (2010-2020)	3rd HIGHEST(3.58%)			2010-2020	Ranking done among 15 countries based on data availability.
11	AAGR of overweight children under 5 yrs. Age (2010-2020) (bmi≥25)	LOWEST (-3.07)			2010-2020	Among the 24 selected countries.
12	Average annual overweight prevalence (BMI≥25) among children & adolescent (5-19 yrs.) 2010-2016	LOWEST 5.53	LOWEST 5.96	LOWEST 5.04	2010-2016	II
13	Average annual overweight prevalence (BMI≥25) among adult (20 yrs. & older) 2010-2016	LOWEST 18.06	LOWEST 16.17	LOWEST 19.96	2010-2016	II

India's Relative Advancement

SL. No	Indicators	Ranks	Year/Duration	Remarks
14	AAGR in per capita Health Expenditure (highest to lowest)	5th highest (4.03%)	2010 to 2019	Among the 24 selected countries.
15	AAGR in Domestic General Government Health Expenditure (% CHE)	2ND HIGHEST (3.29%)	2010-2019	II
16	AARR in Out of Pocket Expenditure (% of CHE) (2010-19) (%)	4th Highest (1.75%)	2010 to 2019	II
17	AAGR in SDG Scores from 2010 to 2021 (Highest to lowest value) (%)	Highest (1.03%)	(2010 - 2021)	II

4.2 Discussion:

Present studies has tried to make its effort to discuss India's health status taking some selective health and health related indicators and comparing it's health status with other 23 countries having highest GDP rank in the world and having GDP more than 5 lacks million US$ in the year 2021. Selected Health and Health related Indicators are: Prevalence of Insufficient Physical Activity (Both quantitative and qualitative aspects), Total NCD Deaths, Child and Adult Mortality, Healthy Life Expectancy, Stunting, Wasting, Underweight and Overweight Prevalence, Health Expenditure, Out of Pocket Expenditure and Sustainable Development Scores.

Globally, one in four adults and three in four adolescents (11-17yrs) do not presently meet the WHO's recommendations for physical activity. The target of 15% relative reduction in the Global prevalence of physical inactivity in adult and in adolescent by 2030 was adopted by member countries (World Health Organization, 2018, pp. 6 , 8). **Insufficient physical activity is considered as 4th leading risk factor for mortality. Every year, near about 3.2 million deaths and 32.1 million Disability Adjusted Life Years (DALYs) are accountable for insufficient Physical Activity. Insufficiently active people have 20-30% higher risk of all-cause of mortality** (WHO, n.d.).

To the Global Status Report on Physical Activity 2022(WHO 2022), World-wide 81% of adolescent and 27.5% of adult currently do not meet the recommended level of physical activity given by WHO. Report also illustrates that economic burden of physical inactivity is much high, between 2020 to 2030 almost 500 million new cases of preventable Non-communicable Diseases will occur which will incur the treatment cost over US$ 300 billion or approximate US$ 27 billion annually if the trend of current prevalence of physical inactivity does not change (World Health Organisation, 2022, p. vii).

With a view to reduce physical inactivity GAPPA recommends four strategies which are to create Active Societies(1), to create Active environments(2), to create Active System(3) and to create Active People(4) and WHO encourages member countries to have 'a whole -of -system approach' taking all four strategies together involving all the relevant government departments and engaging all the stakeholders across multiple sectors along with health, sport, education, transport and urban planning. The 4th strategy " To Create Active People" prioritizes the 6 policies among which first two policies are to enhance physical education and school based programme and to incorporate physical activity into health and social services(WHO,2022,pp. 13-15).

Although India's average annual value in prevalence of Insufficient Physical Activity for adolescent (11-17yrs) from 2010 to 2016 were comparatively lower than other countries (ranks as the 2nd

lowest for both sex, 5th lowest for male and lowest for female among selected countries) it's values for both sex, for male and for female (74.48%, 72.78 % and 76.38 % respectively) were considerably higher. In adult (18+yrs), prevalence of insufficient physical activity was higher in India in 2016 as per available latest data. India ranked as 10th highest country for both sex(34.03%) and 6th highest country for Female (43.89%) among 24 selected countries. Prevalence of IPA for Male adult were quiet lower (24.7 %) in compare to other selected countries. Average Annual Rate of Reduction in insufficient physical activity for school going adolescent (11-17Yrs.) from 2010 to 2016 was quiet better than other countries having percentage for both sex 0.25, for male 0.45 and for female 0.26 but the decreasing rate is not adequate to meet the **Global target of 15% reduction in Physical inactivity by 2030** as between the year 2010 and 2016 the reduction rate in adolescent (11-17yrs.) are very poor 1.47% for both sex, 2.70% for male and 1.57% for female. By 2030 India's predicted prevalence of Insufficient physical activity(11-17 Yrs.) will be 71.43 based on average annual rate of reduction from 2010-2016(Table 4.1.1.15).

No significant direct correlation is observed between current Health expenditure and IPA, between GGHE-D and prevalence of IPA, and between Out of Pocket Expenditure and IPA by computing the selected present data, but different socio-economic data should be considered to find out the actual relationship, as Zhao et al. (2022) and Carlson et al.(2014) observed association between Physical inactivity and OOPE and between inadequate physical activity and health care expenditure respectively.

With a view to investigate the patterns of Physical Activity in India, Podder et al. (2021) conducted a nationwide study on 233805 adult individuals (18+ yrs.) during Niyantrita Madhumeha Bharata (NMB) 2017 (phase-I), and concluded that 57% of surveyed population in India do not meet the physical activity regimen recommended by World Health Organisation.

India's Direct health care costs attributable to NCDS and mental health associated with physical inactivity is approx. 322 crore US$ (Global status report on physical activity WHO,2022) and India ranked as the 4th highest country among 24 selected countries(Table 4.1.1.6). **This status is much alarming for socio-economic development in India.**

Since Independence, All India Council of Sports was formed in 1954 to promote sports, the first sports policy was implemented in 1984, and in 2001, National Sports Policy was first updated, National Sports Development Code of India (NSCI) in 2011 was adopted and National Youth Policy was implemented in 2014 (By Ministry of Youth Affairs and Sports, Government of India) with a view to create a productive workforce, to develop a strong and healthy generation through **health and**

Healthy lifestyle and Sports, to instil social values, to facilitate participation and civic engagement and to support youth at risk and to create equitable opportunities for all disadvantaged and marginalised youth. Finally Honourable Prime Minister of India initiated 'Fit India Movement' in 29th august 2019 (Ministry of Youth Affairs and Sports, Government of India) with a great interest to make 'Physical fitness a way and integral part of daily life' and to make the nation more physically active and more healthier through behavioural changes to curb lifestyle related diseases and Non-communicable diseases. Ministry of Youth Affairs and Sports, Government of India, adopted different policies and action plans for three population groups: 5-18 yrs., 18-65 yrs. and 65 years and above. Sixty minutes (60 minutes) moderate to rigorous activities is recommended for 5-18 yrs.(Clarke and Mondal, 2022). As per Annual Report 2022-23, NITI Aayog, Government of India, **Mission 'LiFE'** (Life style For Environment) launched Globally in 20th October, 2022 by Prime Minister of India where one of the seven proposed actions was 'Healthy life style adoption' (Niti Aayog, Government of India, 2022, pp. 18 and 20).

Fit India movement 2019, to bring all the people of India under one umbrella of Health and wellness through guided physical activities and fitness is a good initiative from MYAS, Govt. of India, but efficacy of implementation, feedback from the population groups and evaluation in respect of various health indicators have yet to be come out.

India has taken several policies guided by WHO to reduce the physical inactivity except implementation of tax incentives to promote physical activity but reflections of different adopted policies taken by India is yet to be assessed in all the corners of the society.

It has been and will be a great challenge for all selected countries including India to reach the Global target for 15% reduction in physical inactivity by 2030 as recommended by GAPPA 2018-2030 (WHO, 2018) as average annual rate of reduction of physical inactivity is very poor for most of the selected countries and for some countries it bears negative values.

All non-communicable diseases together accounted for 74% of deaths globally in 2019 (WHO,2022). To present study, in India, the total number of death from non-communicable disease in the year 2019 is 6046960 for both sex, 3339492 for male and 2707468 for female. India ranked as the 2nd highest country among the 24 selected countries in total number of deaths from non-communicable diseases in the year 2019 and China scored as the highest country to have maximum number of deaths 9057956 for both sex,5293930 for male and 3764027 for female from non-communicable diseases among the selected countries in 2019 (Table 4.1.2.2).

Percentage of death from non-communicable diseases is least (66%) in India among the selected 24 countries, others have more than 70% of death from NCDs. But, the percentage of the probability of premature mortality from NCDs is considerably high (22%) and stands as the 3rd highest country among the 24 selected countries. Indonesia and Russian Federation rank as the highest and the 2nd highest country having 25% and 24% probability of premature mortality from NCDs respectively (Table 4.1.2.6).

India ranked as the 2nd highest country in average deaths from NCDs from 2010-2019 among all the selected countries. India possesses the highest value in female (3.165 %), 5th highest in Both sex (2.535%) and 8th highest (2.05%) in male among all the selected countries in case of Average Annual Growth Rate(AAGR) in number of deaths from NCDs from 2010 to 2019. It is alarming that annually growing tendencies in number of deaths from NCDs is observed in India, women are more vulnerable than male(Table-4.1.2.5 and Figure 4.1.2.4).

It is found that there are no significant direct association between total health expenditure and number of death from NCDs but **weak negative association is found between Domestic General Government Health Expenditure and number of death from NCDs** (Table-4.1.2.8 to 4.1.2.9 and Figure 4.1.2.5 to 4.1.2.6). **Out of Pocket of expenditure (% of CHE) is found as positively correlated to number of death from NCDs (Table-4.1.2.10 and Figure-4.1.2.7).** From 2010 to 2019, India's average annual Domestic General Government Health Expenditure (as % of Current Health Expenditure) were the poorest (28.30%) and average annual Out of Pocket Expenditure (% CHE) were the highest (61.96%) among all the selected countries.

Global Action Plan for the prevention and control of non-communicable diseases 2013-2020, was adopted by WHO 2013 with a vision ' A World free of the avoidable burden of non-communicable diseases' where 9 global targets were fixed to be achieved by 2025. Among the nine global targets two valuable targets were 25% relative reduction in risk of premature mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases and 10% relative reduction in prevalence of insufficient physical activity (WHO, 2013, pp. 3 & 5**). In 2015, Global target was adopted by all countries to reduce one third the premature deaths from non-communicable diseases (SDG target 3.4.1) by 2030** (**Non-Communicable Diseases progress monitor 2022, WHO, 2022, p v). But, Average Annual Growth Rate (2.54%) in number of deaths from non-communicable diseases from 2010 to 2019 in India and predicted number of deaths from NCDs which is** 7964244 **by 2030 reveal that India are far away from the target.**

Global Status Report on Physical Activity 2022 reflects that the progress has been slow and uneven regarding policy implementation to increase the levels of physical activity. The impact of this situation lies on health of 27.8% of global adult population (around one billion adults) and this situation constraints the contribution of physical activity for achieving Sustainable Development Goals 3.4 (By 2030 to reduce one third premature mortality from non-communicable diseases through prevention, treatment and promote mental health and wellbeing.) (WHO,2022,p.90).

India had Highest average under five child mortality rate from 2010-21 (43.11) and had highest average mortality rate among 5-14 yrs. from 2010 to 2019 (7.034) among the selected countries . Between 2010 to 2016, in India, average annual morality rate in adult (15-60 Yrs.) was higher (2nd highest for both sex, male and Female). But it is positive sign for India to have higher Average Annual Rate of Reduction (AARR) of mortality rate among under-five yrs. (5.66%, ranks as 4th highest country) and among 5-14 yrs. (5.38%, ranks as 2nd highest country) from 2010 to 2021 and 2010-2019 respectively. It is also good for India to have 5th highest rank for female in AARR in adult mortality rate (2.37%) from 2010 to 2016, but Average Annual Rate of Reduction for the same for both sex and for male are much lower.

SDG Target 3.2 for New-born and child mortality By 2030 is to end preventable deaths of new-borns (SDG 3.2.2) and children under 5 years of age (SDG 3.2.1), with all countries aiming to reduce neonatal mortality and under-5 mortality. India is far away from the Target, as in 2021, India's score is 30.62 and avg. annual reduction from 2010 to 2021 is 5.66% only. In 2021, most of the other selected countries' scores are under 10. There are only four countries (India, Indonesia, Brazil and Mexico) which scored more than 10. By the existing average annual reduction (5.66%) India's predicted U-5 mortality rate will be highest(18.13) by 2030.

The available data reveals negative correlation between average annual current health expenditure (% of GDP) and avg. annual under-five child mortality rate and also reveals the negative association between avg. annual current health expenditure (% of GDP) and avg. annual children mortality rate (5-14 yrs.) from 2010-2019 . Negative correlation also exists between Domestic General Government Health Expenditure and children mortality rate for both under five years and for 5-14 yrs. Direct negative association is also found between avg. annual current health expenditure (% of GDP) and avg. annual adult mortality rate (15-60 yrs.) from 2010-2016. Domestic General Government Health Expenditure is negatively correlated with adult mortality rate. It is also observed that rate of mortality in all ages is positively correlated to Out of Pocket Expenditure(Table 4.1.7.6). Non - communicable diseases are also a risk factor of children and adult mortality rate.

Preconception care could help to reduce childhood and maternal mortality and to improve child and maternal health outcomes. Preconception experience is growing in Italy, Netherlands and United States of America. Preconception care comprises biomedical, behavioural and social health. WHO suggested strong public health programme for a life-course perspective from infancy to adulthood (WHO, 2013,pp.6-8). ' More active people for healthier World ' is adopted by WHO in 'Global Action Plan on Physical Activity, 2018-2030' to promote behavioural and social health (WHO,2018,p.8).

Japan has the highest healthy life expectancy at birth and also at 60yrs. from in the year 2010, 2015 and 2019. Healthy Life Expectancies at birth for both sex in Japan were **73 yrs**. in 2010, **73.6** yrs. in 2015 and **74.1** yrs. in 2019. HALE at 60 yrs. for both sex in Japan were **19.69** yrs.in 2010, **20.04** in 2015 & **20.39** yrs. in 2019 among 24 selected countries. **'Health Japan 21'** a national health promotion movement was initiated in Japan in 2013 for achieving the two major targets for increasing healthy life expectancy and for reducing health inequality (Monma et al.,2019,p.2).

India's Healthy Life Expectancy at birth and at 60 yrs. for both sex were the **lowest** among all the selected countries having values 57.1 Yrs. (at birth) and 12.57 Yrs. (at 60 yrs.) in 2010, 59.1 Yrs. and 13.06 Yrs. in 2015 and 60.3 Yrs. (at Birth) and 13.25 Yrs.(at 60 Yrs.) in the year 2019 respectively. But, India's Growth rate in HALE at Birth between the year 2010 and 2015 and between the year 2015 and 2019 were 2nd highest for both sex and for male (3.14% and 3.68%, 2.03% and 2.03% respectively) and were highest (2.78% and 2.03%) for female among all the selected countries. Growth Rate in HALE at 60yrs. between the year 2010 and 2015 were 5th highest (3.90%) for both sex, 2nd highest(5.69%) for Male and 7th Highest(2.23%) for female. But, Growth Rate between the year 2015 and the year 2019 are not satisfactory, ranking for both sex was 17th (1.13%) among 24 countries.

It is very interesting fact that Globally Healthy Life Expectancy increased by 8% from 2010 to 2019 (58.3% to 63.7 %) owing to declining mortality rather than reduced years lived with disability (WHO, 2020).

While correlate current health expenditure(% of GDP) with the Healthy life expectancy at birth and at 60 yrs. in 2019 it is noticed that positive correlation exists between the current health expenditure (% of GDP) and the Healthy life expectancy at birth (Yrs.) having P value 0.0042 for both sex, 0.0027 for male and 0.0106 for female category and also between the current health expenditure(% of GDP) and the HALE at 60yrs (Yrs.) in 2019 for both sex, for male and also for Female having p values 0.0014, 0.0011 and 0.0024 respectively (Table-4.1.4.10 and 4.1.4.11 , Figure 4.1.4.11 and 4.1.4.12).

Domestic General Government health Expenditure (% CHE) is also positively correlated with HALE at Birth and HALE at 60 yrs. as per data in the year 2019 (Table-4.1.4.12-4.1.4.13 and Figure 4.1.4.13 and4.1.4.14). But, **Negative association** is found (based on the data of 2019) between Out of Pocket Expenditure(%CHE) and HALE at birth and between Out of Pocket Expenditure(%CHE) and HALE at 60 yrs.(Table-4.1.4.14-4.1.4.15 and Figure 4.1.4.15-4.1.4.16). Countries with higher Healthy Life Expectancy have lower Out of Pocket Expenditures. From 2010 to 2019 India's avg. annual Out Of Pocket Expenditure (% of CHE) remains highest (61.96%) among all the selected countries, on the other hand Domestic General Government Health Expenditure (%CHE) is the lowest 28.30 % among all the selected country for the same period 2010-2019.

Several studies reveals the association between Physical activities and Healthy Life expectancy. A Recent Study conducted through analysing 30 yrs. medical reports shows the maximum association in reduction of early death in people who engaged in 150 to 300 minutes /week of long term leisure-time- Vigorous Physical Activities (VPA) or 300-600 minutes/week of long term leisure- time-Medium Physical Activities (MPA) or an equivalent combination of both (Lee et al., 2022).

Monna et al. (2019) conducted a research through longitudinal survey in Japan to examine the relationship between exercise or sports in midlife and healthy life expectancy and they founded positive correlation between exercise and healthy life expectancy and concluded that middle-aged individuals engaging in exercise or sports with a higher ratio specially with families or friends have longer healthy life expectancy.

In 2020, globally 149.2 million (22%) of children under 5 years were affected by stunting, 45.4 million (or 6.7 %) of children under five were affected by Wasting, 85.4 million (or 12.6 %) of children under 5 were affected by underweight and 38.9 million (or 5.7 %) children under 5 were affected by overweight (WHO,UNICEF,WORLD BANK 2021, p.1).

India's average annual stunting prevalence under 5yrs age from 2010 to 2020 is highest (37.59%) among 15 countries (as per data availability). In the year 2020, India's stunting prevalence of children under 5 year-age was 30.9%. To the report of NFHS-5(2019-2021), the percentage of the children under 5 yrs. age who are stunned is 35.5. But India has been trying to reduce its stunting prevalence with an Average Annual Rate of Reduction 3.58 % from 2010 to 2020, ranking as 3rd highest country next to Saudi Arabia (2nd Highest ,4.52%) and China (Highest, 5.96%). Based on the AARR in stunting prevalence from 2010 to 2020 and taking initial stunting values of the year 2020, the projected prevalence of stunting children under 5yrs age by the year 2025 and 2030 will be

highest in Indonesia (30.01% and 28.33% respectively) and 2nd highest in India (25.75 and 21.46% respectively) (Table -4.1.5.1.2).

It is also observed that there are negative correlation of current health expenditure and Domestic General Government Health Expenditure with prevalence of stunting children under five years. Positive correlation is found between Out Of Pocket expenditure and prevalence of stunting children under five years.

Based on present reduction rate, only China will hit the interim Global Target adopted by World Health Assembly (2012) which was to reduce 40% reduction in stunting under five years children by 2025. India and Saudi Arabia will be closer to that target by 2025. Netherland, Germany, Belgium, Korea Republic, Poland, Australia, Saudi Arabia & China will be closer to the Global Target SDG 2.2 (To end all forms of malnutrition) by 2030. India along with Indonesia, Mexico and Thailand will be far behind from the Global target SDG 2.2 by 2030.

As per WHO report, in the year 2017 and 2020 India's prevalence of wasting children under 5 yrs. of age were 17.3 % and 18.7%, Indonesia's prevalence was 10.2% in 2018 and Thailand's prevalence of wasting was 7.7% in 2018. As per available sporadic data India's stunting prevalence is maximum.

To the report of NFHS-3(2005-06), NFHS-4(2015-16) and NFHS-5 (2019-21), India's wasting prevalence under five are 19.8%, 21% and 19.3**%. It is observed that wasting prevalence increases from NFHS-3 to NFHS-4 by approx. 6% and thereby decreases by approx. 8% from NFHS-4 to NFHS-5. India will not achieve the target fixed by WHA(2012) to reduce wasting under five years by less than 5% by 2025 and subsequently will not reach to the SDG 2.2 by 2030.**

The percentage of underweight children under 5 yrs. of age for India were 29.4, 36.3 and 33.4 in the year 2014, 2015 and 2017 (as per WHO) respectively which are much higher than that of the other countries as per available sporadic data. India's Underweight prevalence under five yrs. to NFHS-4 (2015-16) was 35.8% and to NFHS-5(2019-21) it was 32.1%. Reduction rate of underweight prevalence under five from NFHS-4 to NFHS-5 was only 10.34%. India will not hit the SDG 2.2 by 2030 based on that reduction trend.

India had the 2nd lowest (2.18%) average overweight prevalence under five yrs. children from 2010-2020. Japan had the lowest overweight prevalence with 2.11% and Australia had the highest prevalence with 15.97%. All the countries are showing increasing tendencies in Average Annual Rate of Reduction(AARR) in overweight prevalence under five except India and Mexico. **As per report of the WHO, India will be in save zone to be closed to the target (fixed by WHA, 2012), not to**

increase overweight prevalence under five year children by 2025 (WHO,2014). India also will be close to the SDG 2.2 by 2030 by the present trend of under-five overweight prevalence as per data of WHO. But, the report of NFHS-4(2015-16) and NFHS-5 (2019-21) reflects approx. 62% growth (2.1 to 3.4) in under five overweight prevalence. It will be much alarming for India.

The Prime Minister of India launched POSHAN Abhiyaan (Prime Minister's Overreaching Scheme for Holistic Nourishment) on 8th March 2018, with a budgetary allocation over 9000 crore (FY 2017-18 to 2019-2020) with a view to reduce numbers of stunting children, under-nutrition, anaemia & low birth weight (Niti Ayog, Goernment of India,2019,p.7).

The present report of NFSH-05 (2019-21) and available report of WHO, reflect India's very poor performance regarding stunting, Wasting and underweight children under 5 yrs. age in respect of selected countries and it will be a very difficult task to achieve the Sustainable Development Goal 2.2 (By 2030, end all forms of malnutrition, including achieving the internationally agreed targets by 2025 on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons).

Among the selected countries India had highest average annual prevalence of thinness(BMI<18) in children and adolescent (5-19 Yrs.) from 2010 to 2016 and also had highest average annual prevalence of underweight in adult (20yrs. and older) from 2010 to 2016 having values for Both sex, Male and Female 27.11%, 31.27% and 22.49% respectively in children and adolescent and for Both Sex 24.73%, Male 24.30% and Female 25.24% in case of adult. Very feeble improvement in Average Annual rate of Reduction in thinness for children and adolescent in both sex is found (only 0.25%) but mild increasing tendencies is also noticed in female from 2010 to 2016. In case of adult the AARR in adult are 1.54%, 1.63% and 1.38% for both sex, male and female which are not up to the mark (Table No 4.1.5.3.2 - 4.1.5.3.5)(Figure no. 4.1.5.3.1 - 4.1.5.3.4).

In spite of having the lowest values in average annual over weight prevalence (BMI≥25) in children and adolescent (5-19 yrs.) for both sex (5.53%), male(5.96%) and female(5.04%) India had highest Average Annual Growth Rate(AAGR) in prevalence of overweight children and adolescent for both sex (7.53%), male (8.25%) and female (6.85%) from the year 2010 to 2016 among selected 24 countries. Same tendency is also found in case of adult where average annual overweight(BMI≥25) prevalence in India was lowest for both sex(18.06%), male(19.96%) and female(19.96) from 2010 to 2016 but AAGR for that time being (2010-2016) was much higher(for both sex 3.00%, male 3.36% and female 2.71%) and ranked 3rd highest country next to Thailand (Highest) and Indonesia(2nd highest) among all the selected countries (Table 4.1.5.4.3-4.1.5.3.6).

It is much alarming that the Percentages of women and men (age 15-49 yrs.) in India whose BMI is below normal(BMI<18.5 kg/m2) are 18.7 and 16.2 and the Percentages of women and men (age 15-49 yrs.) in India who are overweight or obese (BMI≥25Kg/m2) are 24 and 22.9. Increasing tendencies in overweight prevalence for women and men are also noticed between NFSH-4 (2015-16) and NFHS-5 (2019-21) (Table No. 4.1.5.4.7).

Present study shows the negative associations among Average Health expenditure(% of GDP) and Avg. Domestic general government health expenditure with average prevalence of thinness or underweight among the children and adolescent (5-19yrs), and adult from the year 2010-2016. But somewhat strong positive correlations are found between Out Of Pocket Expenditure and average prevalence of underweight among the children and adolescent (5-19yrs), and adult from the year 2010-2016. No direct association among current health expenditure, GGHE-D and OOPE with prevalence of overweight children under 5 years is observed. In case of overweight child and adolescents (5-19 yrs.) and in overweight adults mild direct positive correlations are found with health expenditure. Mild negative correlation is found between OOPE and of overweight child and adolescents (5-19 yrs.) and adult. There may be other qualitative factors to define the association between health expenditure and prevalence of overweight children and adult. Preventive health care expenditure as percentage of current health expenditure may be considered.

Different studies prove that maternal factors such as maternal nutrition during preconception, underweight, maternal short stature owing to nutritional vulnerability (under-nutrition, overweight, obesity and micronutrient deficiency), life course approach of diet, nutrition and prevention of chronic diseases, exercises before and during childbearing year and maternal education are associated with children malnutrition. (Agus et. al. 2022; Young et.al.2018; James et al. 2022; Hill et al. 2004; Terrones et al.(2019); Hammer et al. 2000; Stephension et.al. 2018; Abuya et al. 2012; Hossain & Khan, 2018).

One of four objectives of Global Strategy on Diet, Physical Activity and Health was to increase the overall awareness and understanding of the influences of diet and physical activity on health and of the positive impact of preventive interventions(WHO, 2004). In 3rd National Health Policy of India(2017), one of the seven priority areas of preventive and promotive health policy for improving environment for health was '**Balanced, healthy diets and regular exercise'**(Ministry of Health and Family Welfare, Government of India (MoHFW), 2017, p. 6).

Over the past two decades global spending on health becomes more than doubled and reaches to 9.8 % of global GDP but the distribution is unequal having approx. 80 % in high income countries. In

case of Low income countries, health spending was primarily contributed by Out-of Pocket expenditure (44%) and external aid (29%) but in high income countries government expenditure was dominated by 70% (WHO,2021,p.vi).

Several studies, Cremieux et al.(1999), Nixon et al.(2006), Novignon et al.(2012) and Rahaman et al.(2018) establish that health expenditure plays a crucial role for health status improvement.

India ranks as the 2nd lowest country among 24 selected countries in average annual health expenditure (as % of GDP) from 2010-19. The average annual health expenditure of five countries from 2010-19, China, Turkey, Thailand , India and Indonesia are below 5% having values of each 4.814%, 4.311%, 3.648%, 3.322% and 2.913% respectively. Negative growth in average annual health expenditure(as % of GDP) from 2010 to 2019 is observed for India (-0.66% and ranks as 2nd lowest country). India's average annual health expenditure per capita income in US$ and average annual domestic general government health expenditure (% of CHE) from 2010 to 2019 are lowest among all the selected countries having values 55.70 US$ and 28.30 % respectively but accelerating tendencies are found both in AAGR in health expenditure per capita (4.03%, rank 5th highest) and in AAGR in domestic general government health expenditure (3.29%, rank 2nd highest) from 2010 to 2019.

India's average annual out of pocket expenditure (as % of CHE) from 2010 to 2019 was highest (61.96%) among all the selected countries but India ranks as the 4th highest (1.75%) countries in Average Annual Rate of Reduction in out of pocket expenditure from 2010 to 2019.

'To achieve Universal Health Coverage, including financial risk protection, access to quality essential health care services and access to safe, effective, quality and affordable essential medicines and vaccines for all' is an important targets (3.8.) of Sustainable Development Goal 3 (To ensure healthy lives and promote well-being for all at all ages.). The indicators of 3.8.2 are the population spending more than 10% of their household consumption or income on Out of Pocket health care expenditure and the population spending more than 25 % of their household consumption or income on health Out of Pocket. Any amount spent on health out of pocket is considered as a source of financial hardship for the poor. 9.96 million people in the World comes under financial hardship owing to Out of Pocket expenditure (3.8.2, > 10%) in 2017 out of which 435 million people were pushed for further into extreme poverty and 70 million people were pushed into extreme poverty(World Health Organisation and International Bank for Reconstruction and Development,2021).

Globally increasing tendencies in portion of population spending more than 10% household consumption or income on Out of Pocket expenditure and also more than 25% household

consumption or income on Out of Pocket expenditure are observed from the year 2010 to 2019, which are much alarming (Table 4.1.7.4). In India, in the year 2011 portion of population spending more than 10% of their household consumption or income on out of pocket expenditure was 17.9% and in the year 2017 it became 17.5% and portion of population spending more than 25% of their household consumption or income on out of pocket expenditure was 4.55% in the year 2011 and that of in 2017 was 6.67% (Table 4.1.7.5). **This scenario is very much concerning in socio-economic aspects.**

Zhao et al. (May, 2022) studied whether Out of Pocket expenditure associates with Physical Inactivity, Excessive Weight, and Obesity in China and they concluded that physical inactivity was significantly associated with greater OOPE at both higher percentiles and lower percentiles of OOPE spending.

Carlson et al. (Aug. 9, 2014) studied on inadequate physical activity and health care expenditure In the United States and observed that 11.1% of aggregate health care expenditure is associated with inadequate physical activity.

‘ Transforming our World : the 2030 agenda for Sustainable Development’ was adopted by UN General Assembly on 25th September 2015 having action plans for People, Planet, Prosperity, Peace and Partnership and fixing **17 Sustainable Development Goals with 169 targets**. India’s average annual SDG score from 2010 to 2021 was lowest (57.18) among all the selected countries but its Average Annual Growth Rate (AAGR) in SDG score was highest (0.99%). Projected SDG score of India by 2030 also will be lowest (65.76) among all the selected countries. Current average annual growth from 2010-2021 is not satisfactory for all the selected countries and all the countries will fail to achieve the SDG target(100) by 2030 if all the countries do not achieve the accelerated required annual growth rate. By 2030 Sweden will be the highest scoring country as per present growth rate and required growth rate to achieve the target will be lowest (1.80) among all the selected countries based on the score of 2021. India requires the highest Average Annual Growth Rate (5.84%) to reach the target score 100, by 2030 among all the selected countries, as India’s SDG-Score was very poor (59.98) in 2021 (Table 4.1.8.1-4.1.8.4) (Figure 4.1.8.1 - 4.1.8.2).

CHAPTER-V

SUMMARY, CONCLUSION and RECOMMENDATION

5.1 Summary:

Health is considered as an integral part of the development. The Global strategy for 'Health for all by 2000' was adopted by World Health Assembly in 1979. The healthy people and a healthy World is the main concern of the future Planners. Presently with a vision for 'More active people for healthier World' Global Action Plan on physical activity 2018-2030 taken by World Health Organization having four objectives: creating Active Societies, Active environments, Active people and Active system. More latest, the UNO is striving towards 'Transforming our World: the 2030 agenda for sustainable development'. India is also in the same boat with member countries to achieve the targets of this great mission.

Researcher intends to investigate the present status of the health in India, how much progress is made , where the constraints are and how far its health status remains from the Global target fixed by WHO, in respect of selected health indicators compared with the health status of other twenty three counties having highest GDP(%) in the World in 2021. Emphasis is given on the Physical Activity as a fundamental means of behavioural health. Countries selected for the present study are United States, China**,** Japan, Germany, United Kingdom, India, France, Italy, Canada, Korea Republic, Russian Federation, Brazil, Australia, Spain, Mexico, Indonesia, Netherlands, Saudi Arabia, Turkey, Switzerland, Poland, Sweden, Belgium and Thailand.

Both quantitative and qualitative data/information have been collected from open source of the websites of the World Health Organization, the World Bank data base and Ministry of Health and Family Welfare, Government of India, and other related websites for the study. Health related Indicators selected for the study are Insufficient physical activity, Deaths from non-communicable diseases, Children and adult mortality rate, Healthy Life Expectancy, Stunting, wasting, underweight and overweight prevalence, health expenditures and related indicator Sustainable Development Goal Index Score and qualitative indicators regarding different health policies for promoting physical activities. Arithmetic average, Growth Rate, Reduction Rate, Average Annual Growth Rate and Average Annual Rate of Reduction and predicted values based on AAGR and AARR of selected health indicators and correlation among health expenditures with other health indicators are conducted for the study. Data analysis and presentation are reflected through table and figure.

In regard to selected countries India's poor performance is noticed in in average number of Deaths from NCDs/year, avg. Under five Children Mortality rate, avg. Children Mortality rate 5-14 Yrs., avg. Adult Mortality (15-60 Yrs.)/1000 population, Healthy life expectancy at Birth(Yrs.) and at 60 yrs., avg. prevalence of stunting children under 5 yrs. of age, avg. prevalence of thinness among children and adolescent (5-19 yrs.), and in adult (20 yrs. or older). Finally, India earns the poorest SDG Scores.

But, India's Average Annual Rate of Reduction is much better in prevalence of Insufficient Physical Activity, stunting children under 5 yrs. of age , in Children mortality rate in under 5 yrs. and 5-14 Yrs.. Growth rates in HALE at birth in between the years 2010, 2015 and 2019 are also better.

India's average annual current health expenditure (% of GDP) from 2010 to 2019 is just 3.32% and ranked as 2nd lowest country, above Indonesia which ranks as the lowest (2.91%) countries among all the selected countries. India's average annual growth rate is -0.66(%).

Among all the selected countries, Average annual Per Capita Health Expenditure and Average annual Domestic General Government Health Expenditure (%CHE) are lowest in India from 2010 to 2019 having values 55.70 US$ and 28.30 respectively. On the other hand, India's average annual Out-Of Pocket Expenditure (%CHE) from 2010 to 2019 is highest, having values 61.96.

However, India has achieved progress in Average annual Growth Rate in per capita health expenditure, in Domestic general government health expenditure and in Average Annual Rate of Reduction in Out-Of-Pocket expenditure during 2010 to 2019.

A negative correlation is observed among children and adult mortality rate with current Health expenditure and Domestic general government health expenditure, but somewhat strong relation are found between Out Of Pocket (OOPE) expenditure and prevalence of children and adult mortality. Weak negative association between Domestic General Government Health Expenditure(% CHE) and number of NCD deaths, and positive relation between OOPE and number of NCD Deaths exist. Moderate positive correlation is found between current Health expenditure and HALE and also between Domestic general government health expenditure and HALE. Negative Association exists between HALE and Out of Pocket Expenditure. Negative correlations are also noticed among prevalence of stunting children(Under 5 Yrs.) and prevalence of underweight (among Children & adults) with current health expenditure (%of GDP) and with Domestic General Government Health Expenditure, but strong positive correlation exists with Out-Of-Pocket Expenditure(OOPE).

India's position is better than other selected countries in Prevalence of IPA(11-17 yrs.) although the average prevalence of IPA is considerably high in adolescent from 2010 to 2016 (74.48 %, both sex)

and in adult in 2016 (34.03% for both sexes). As per available qualitative data from WHO, India has taken most of the strategies and policies to promote physical activities except 'Existence of tax incentive to promote physical activity'.

India's average overweight prevalence are lowest in under five year children, in 5-19 year children and adolescent, and in adult (20 yrs. and older) but AAGR is much higher in overweight prevalence in 5-19 yrs. and in adult.

India will be very close to the Global targets fixed by the World Health Assembly (2012) by resolution 65.6, which were 40% reduction of under-five stunting children and not to increase childhood overweight by 2025.

India's latest health policy, which was adopted in 2017 with the goal of attaining the highest possible level of health and well-being. Mainstreaming AYUSH is one of the objectives of that policy. Emphasis is also given on Balanced, healthy diet and regular exercises. Ayushman Bharat launched in 2018 for setting up setting up of 150000 Health and Wellness Centres (HWCs) by 2022 and for delivering Pradhan Mantri Jan Arogya Yojana (PM-JAY). Fit India Movement launched in August, 2019 to promote fitness. Finally, India has extended its National Health Mission up to March 2026 fixing some targets: reduction of Maternal Mortality Ratio (MMR) to 90/100000, reduction of Infant Mortality Rate (IMR) to 23/1000 live births & reduction of under-five Mortality Rate (U5MR) to 23/1000 live births by 2025. But reduction of Insufficient Physical activity remains untold specifically in the projected targets under NHM 2025.

Several studies reveal the association between physical activity and many health indicators such as NCDs, child mortality and Nutrition and Healthy life expectancy.

Globally, more emphasize is being given to preventive health care. Different policies and strategies have been taken by WHO and UNO to reduce physical inactivity for healthier world, such as 'Health for all by the year 2000', Global Strategy on Diet, Physical Activity, and Health, 2004, 'Global Action Plan for the prevention and control of non-communicable diseases, 2013 -2020,' 2013 and in 'Global Action Plan on Physical Activity, 2018-2030'. India has also taken some recent policies in response of Global strategies such as 'Balanced, healthy diets and regular exercise', 2017, Ayushman Bharat, 2018, Fit India Movement, August, 2019 and Mission 'LiFE' (Life style For Environment), 20th October, 2022. India also adopted almost all the policies and programmes to promote physical activity selected for the present study except implementation of tax incentives.

India has already joined the Global Mission 'Transforming our World: the 2030 Agenda for Sustainable Development' for people, planet and prosperity. India has to achieve the global target such as 15% relative reduction in prevalence of insufficient physical activity, reduction of one third of the premature deaths from non-communicable diseases (SDG target 3.4.1) by 2030 and end of preventable deaths of children under 5 years of age (SDG 3.2.1) by 2030 and to end all forms of malnutrition by 2030 (SDG 2.2) along with fulfilling other related goals. However, the obtained data and the rate of improvements reflect that India is far away from the Global targets fixed by WHO and the UN by the year 2030.

5.2 Conclusion:

Present study, compares and evaluates India's health status with 23 countries having highest GDP (GDP > 5 lacks US$) in the World in 2021 as per World Bank Data Report 2022. India's health status is also evaluated with the Global targets fixed by WHO/UNO. India along with other country has already shouldered the great responsibilities 'Transforming our World' the 2030 Agenda for sustainable development. India also emerged as the 6th largest economy in the World in 2019, 2020 and in 2021. Available data on selected health indicators reflect that India's health status is not up to the mark. India has been struggling with highest average annual children mortality rate in both Under-five and 5-14 yrs. since 2010, highest average annual prevalence of stunting children under 5 yrs. (37.59%, 2010-2020), highest annual average prevalence of thinness among children and adolescent (5-19 yrs.), BMI< 18, (both sex 27.11%, 2010-2016), highest average annual underweight prevalence among adult (20yrs and older), BMI< 18(Both sex: 24.7%, 2010-2016), 2nd highest avg. annual number of deaths from non-communicable diseases (Both sex 5443289, from 2010-2019), 2nd highest avg. annual Adult Mortality rate (15-60Yrs)/1000 population(both sex, 186 from 2010-2016), highest average annual growth in overweight prevalence (BMI≥25) among children and adolescent (5-19 yrs.)(7.53% for both sex, 2010-2016) and highest average annual Out of Pocket Expenditure as % of total Health expenditure (61.96% from 2010-2019) among the selected countries.

India also has been facing hindrance in having lowest Healthy Life expectancy at birth(yrs.) in 2010, 2015 and 2019 (57.3, 59.1 and 60.3 yrs. respectively), lowest Healthy Life expectancy at 60 (yrs.) (12.57 yrs. in 2010, 13.06yrs. in 2015 and 13.25 yrs. in 2019), lowest avg. annual health expenditure per capita (55.7 US$ from 2010-2019), lowest average annual domestic general government health

expenditure (%CHE) (28.30% from 2010-2019), and finally having lowest avg. annual SDG scores (57.18 from 2010-2021) among the selected countries.

In spite of having higher initial values India made little beat progress in Average Annual Rate of Reduction(AARR) in under Five Children Mortality from 2010 to 2021, in AARR of children mortality for 5-14 years from 2010-2019, in Average Annual Rate of Reduction in Adult mortality rate in Female (15-60 yrs.) from 2010-2016, in Growth Rate of Healthy life expectancy at Birth (Yrs.) between 2010 and 2015 and also between 2015 and 2019, in rate of Growth in Healthy life expectancy at 60 (Yrs.) between 2010 and 2015, in Average Annual Rate of Reduction of stunting among children under 5 yrs. age (2010-2020) among selected countries.

It is good that India had the lowest average annual overweight prevalence (BMI≥25) among children and adolescent (5-19 yrs.) from 2010-2016, had the lowest average annual overweight prevalence (BMI≥25) among adult (20 yrs. and older) from 2010-2016 and had the lowest average annual growth (%) of overweight children under 5 yrs. age (BMI≥25) from 2010-2020. But highest Average Annual Growth Rate (AAGR) is found in prevalence of overweight among children and adolescent (5-19 Yrs.) and India ranked as the 2nd highest country in AAGR for female adult overweight and 3rd highest country in AAGR of overweight prevalence for both sex among all the selected countries.

In health expenditure, India also accelerated its Average Annual Growth Rate in per capita health expenditure (Ranked as 5th highest), Average Annual Growth Rate in Domestic General Government health expenditure (%CHE) (Ranked as 2nd highest) and its Average Annual Rate of Reduction in out of pocket expenditure (% Of CHE) (%)(Ranked as 4th highest) from 2010 to 2019 in comparing with other selected countries. Despite having lowest initial SDGs score in 2010 and in 2021 (53.63 and 60 respectively), India's Average Annual Growth Rate in SDG scores from 2010 to 2021 (%) is highest among selected countries.

Available data reveals that India is far away from the global target such as 15% relative reduction in prevalence of insufficient physical activity, to reduce one third of the premature deaths from non-communicable diseases (SDG target 3.4.1) by 2030, to end preventable deaths of children under 5 years of age (SDG 3.2.1) by 2030 and to end all forms of malnutrition by 2030 (SDG 2.2) in spite of having possibility to remain very close to the internally fixed Global targets adopted by WHA(2012, Resolution 65.6) which are reduction of stunting children under five by 40% and not to increase childhood overweight by the year 2025.

Globally, preventive health care is being encouraged by WHO. Different plans and strategies such as Global Action Plan for the prevention and control of non-communicable diseases**,** 2013-2020 and

Global Action Plan on Physical Activity, 2018-2030, have been taken by WHO to have more active people for healthier World. India has started its 3rd National Health Policy in 2017 for achieving highest possible health for all ages and adopted several missions like Ayushman Bharat in 2018, POSHAN Abhiyaan in 2018 and FIT India Movement in August 2019, Mission 'LiFE' and finally India extended its National Health Mission up to March 2026 fixing many targets to be achieved by the year 2025. India has become the highest populated country in the world. Average annual current health expenditure (% of GDP) from 2010-2019 is only 3.32% and negative annual growth rate (-0.66) is also observed from 2010 to 2019. Average annual per capita health expenditure from 2010 to 2019 is very low (55.7 US$). Average annual growth in Domestic General Government health expenditure form 2010 to 2019 is only 3.29%. Healthy Life Expectancy is positively associated with current health expenditures and also with Domestic general government health expenditure. On the other hand HALE is negatively correlated with Out of Pocket expenditure. Negative correlation is observed among children and adult mortality rate with current Health expenditure and Domestic general government health expenditure, but somewhat strong positive relation are found between Out Of Pocket (OOPE) expenditure and prevalence of children and adult mortality. Weak negative association between Domestic General Government Health Expenditure(% CHE) and number of NCD deaths, and positive association between OOPE and number of NCD Deaths exist.

Several studies establish the positive role of physical activity on health outcomes influencing many health indicators such as NCDs, child mortality and Nutrition and Healthy life expectancy.

Healthy life-style management and practice throughout life-course having guided physical activities, action plans and programmes, increased Domestic General Government Health expenditure and finally the awareness regarding growing healthy habits and adopting healthy guidelines and strategies to compel the every people as well as every nation to follow the standard guidelines can change the scenario of Health status in future.

5.3 Recommendation:

As India's average annual decreasing percentage In IPA among adolescent (11-17 yrs.) from 2010 to 2016 is not enough to meet the Global target i.e. 15% reduction of IPA by 2030, as the % of prevalence of IPA among adult 18+ yrs. in the year 2016 is considerably high & as to the report of 'Global status report on physical activity 2022' every year India's direct health care cost attributable to non-communicable diseases and mental health connected with physical inactivity is US$ 321,81,29877, **India should activate and implement all the policies in full swing regarding**

reduction of physical inactivity by 2030 and should take initiatives to evaluate existing policies, to take initiative to collect present data regarding physical inactivity and to modify and reform the earlier policies and also to have new policies as per GAPPA 2018-2030 and also to have innovative policies considering geographical and socio-economic compatibility. Special attention should be given on female adult and Female adolescent.

'To Create Active People' WHO emphasizes many policies along with the enhancement of Physical Education and school based programme and incorporation of Physical activity in health and social service (WHO, 2022, pp. 13-15). **India as well as the other countries should pay urgent attention regarding the enhancement of Physical Education and school based programme and incorporation of Physical activity in health and social service.**

The immediate strategies should be taken by India and by other countries for greater, extended & effective implementation of the existing policies and to have new policies to scale down physical inactivity as Physical activity is directly or indirectly associated with Sustainable development Goal 3 (SDG-3, Good health & well-being), SDG 2.2(Mal nutrition) etc.

As India's total number of deaths from NCDs in 2010 and in 2019 and the average number of death from NCDs from 2010 to 2019 are higher, fall just below China, and as the India's percentage of growth of NCDs deaths between 2010 and 2019 for female and percentage of average annual growth from 2010 to 2019 for female are highest among all the selected countries, India should take immediate steps regarding scale down of deaths caused by non-communicable diseases emphasizing policies and investment to increase active people for healthier nation.

Different policies with shared multi-sectorial responsibilities and action including the field of education have to be taken immediately to curb down the deaths from non-communicable diseases, to lessen the Direct health care costs attributable to NCDS and mental health associated with physical inactivity and finally to reach the global target (25% relative reduction in risk of premature mortality and 10% relative reduction in prevalence of insufficient physical activity by 2025).

As Out of Pocket expenditure is positively correlated with number of death caused by non-communicable diseases and as India's average annual Out of Pocket Expenditure (% CHE) were the highest (61.96%) among all the selected countries from 2010 to 2019 **special immediate attention should be given to manage the deaths from NCDs in the light of socio-economic condition of the people in India.**

India's health expenditure (% of GDP) and Domestic General Government Health Expenditure had been consistently low every year {less than 4 %(of GDP) and 35% (of CHE) respectively} from 2010 to 2019. India should hike the health expenditure immediately to cope up with the global target for reduction in children and adult mortality and should adopt the effective policies to counter the immediate problem.

As India's avg. annual Healthy Life Expectancy at birth and at 60 yrs. for both sex from 2010 to 2019 are lowest among all the selected countries and as the Current Health Expenditure(% of GDP) and Domestic General Government Health expenditure(% CHE) is positively correlated with HALE and as the Out Of Pocket Expenditure(%CHE) is negatively associated with HALE and as Physical activity is positively associated with HALE, **India should increase its Domestic General Government Health Expenditure immediately to lessen Out Of Pocket Expenditure and should make physical activity mandatory in every classes of people in any way to increase Healthy Life Expectancy.** Globally Healthy Life Expectancy increased 8% from 2010 to 2019 because of lowering mortality rather than reduced years lived with disability (WHO, 2020). So intervention of behavioural health emphasizing physical activity and nutrition is inevitable.

India's current Health expenditure(% of GDP) has been very low since 2010 which is less than 4% of GDP. So countries, whose Health Expenditure (% of GDP) consistently have been very low along with India should prioritize behavioural aspects of health including physical activity-action plan. **India may adopt a Health policy targeting increasing of HALE.**

As several studies reveals that health expenditure has a crucial role on health status and as India's average annual health expenditure from 2010 to 2019 is 3.322% (2nd lowest among selected countries), average annual per capita health expenditure is the lowest (55.70 US$) and average annual domestic general government health expenditure is also the lowest (28.30%) among all the selected countries from 2010 to 2019, **India should increase its current health expenditure(as % of GDP) along with per capita health expenditure and average annual domestic general government health expenditure immediately to reach to the global targets regarding health status by 2030**.

Out of Pocket Expenditure (as % of CHE) had been very high from 2010 to 2019 in India. Portion of population spending more than 10% and 25% of their household consumption or income on out of pocket expenditure were considerably high (17.5% and 6.67% respectively) in 2017. **So India should take immediate steps to lessen the Out of Pocket Expenditure and should emphasize on behavioural aspects of health.**

As all the development indicators have been merged with the Sustainable Development Goals fixing 169 targets with a view to transforming our World by 2030, India should adopt effective action plans immediately to increase SDG index- score to achieve Sustainable Development Goals.

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Appendix A

Recommended Level of Physical Activity For Health

Table A1

Recommended Levels of Physical Activity for Health (WHO, 2010)

Recommended Levels Of Physical Activity For Health (WHO, 2010)			
Age	**Duration of Activity**	**Intensity of Activity**	**Mode of activity**
5-17 yrs.	**60 minutes daily.** (For additional health benefit more than 60 minutes.)	Moderate to vigorous. vigorous activity should be incorporated at three times per week.	Play, Games, Sports, Transportation, Recreation & Physical Education & planned exercise.
18-64 yrs.	**At least 150 minutes** throughout the week. Or **At least 75 minutes** throughout the week. (For Additional Health benefit 300 minutes(moderate intensity) in a week Or 150 minutes vigorous aerobic activity)	Moderate aerobic physical activity (in a bouts of at least 10 minutes). Or Vigorous aerobic physical activity (in a bouts of at least 10 minutes). Or an equivalent combination of moderate and vigorous activity.	Recreational and leisure -time physical activities, Transportation(Walking & Cycling), Occupational, Household chores, Play, game, sports or planned exercise.
65 yrs. & above	**At least 150 minutes** throughout the week. Or **At least 75 minutes** throughout the week. (For Additional Health benefit 300 minutes(moderate intensity) in a week Or 150 minutes vigorous aerobic activity)	Moderate aerobic physical activity (in a bouts of at least 10 minutes). Or Vigorous aerobic physical activity (in a bouts of at least 10 minutes). Or an equivalent combination of moderate and vigorous activity.	Recreational and leisure -time physical activities, Transportation(Walking & Cycling), Occupational, Household chores, Play, game, sports or planned exercise.
Source: Global Recommendation on Physical Activity for Health, WHO, 2010, ISBN 978 92 4 159 997 9, P-7-8			

Table A2

Recommended Guidelines on Physical Activity for Health (WHO, 2020)

Recommended Guidelines On Physical Activity for Health (WHO, 2020)				
Age	**Duration of Activity**	**Intensity of Activity**	**Activities for Additional benefits**	**METs**
5-17 yrs.	**60 minutes daily & at least 3 days a week** vigorous intensity aerobic activities with incorporation of other means that strengthen muscles & bones.	Moderate to vigorous, mostly aerobic activity across the week & vigorous for at least three days.	NA	For Moderate activity **3 to < 6** For vigorous activity **≥6**
18-64 Yrs.	**At least 150 to 300 minutes** throughout the week. Or **At least 75 to 150 minutes** throughout the week.	Moderate aerobic physical activity Or Vigorous aerobic physical activity Or an equivalent combination of moderate and vigorous activity.	Muscle Strengthening activities at least 2 days in a week at moderate or greater intensity so that all major muscle groups involve & For Additional Health benefit 300 minutes(moderate intensity) in a week Or 150 minutes (vigorous aerobic activity) in a week.	For Moderate activity **3 to < 6** For vigorous activity **≥6**
65 Yrs. & older	**At least 150 to 300 minutes** throughout the week. Or **At least 75 to 150 minutes** throughout the week.	Moderate aerobic physical activity Or Vigorous aerobic physical activity Or an equivalent combination of moderate and vigorous activity.	Muscle Strengthening activities at least 2 days in a week at moderate or greater intensity that involves all major muscle groups. & at least 3 days a week varied multicomponent physical activity that emphasizes functional balance and strength training at moderate or greater intensity. & For Additional Health benefit 300 minutes(moderate intensity) in a week Or 150 minutes (vigorous aerobic activity) in a week.	For Moderate activity **3 to < 6** For vigorous activity **≥6**
For Pregnant & Postpartum women	At least 150 minutes in a week.	Moderate aerobic Physical activity.	NA	**3 to < 6**

Source: WHO Guidelines on Physical Activity and Sedentary Behaviour, WHO, 2020, ISBN 978 -92- 4 -001512-8 (ev) & 2018 Physical Activity Guidelines Advisory Committee. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. Washington, DC: U.S. Department of Health and Human Services, 2018.

1 MET(Metabolic Equivalent of Task) is rate of energy expenditure while sitting in rest which is approx.. 3.5ml O_2/KG Body Mass /Minutes (O_2 Consumption at rest). 1 MET=1Kilo Calorie /Kg Body Mass/Hour.

Table A3

Recommended Guidelines on Physical Activity for Health (WHO, 2020)

Recommended Guidelines On Physical Activity for Health (WHO, 2020)				
Age	**Duration of Activity**	**Intensity of Activity**	**Activities for Additional benefits**	**METs**
Adults & older adults with chronic condition (18 yrs. & older)	**At least 150 to 300 minutes** throughout the week. Or **At least 75 to 150 minutes** throughout the week.	Moderate aerobic physical activity Or Vigorous aerobic physical activity Or an equivalent combination of moderate and vigorous activity.	Muscle Strengthening activities at least 2 days in a week at moderate or greater intensity that involves all major muscle groups & at least 3 days a week varied multicomponent physical activity that emphasizes functional balance and strength training at moderate or greater intensity & For Additional Health benefit 300 minutes(moderate intensity) in a week Or 150 minutes (vigorous aerobic activity) in a week.	For Moderate activity **3 to < 6** For vigorous activity **≥6**
Children & Adolescent Living with Disability (5-17Yrs)	**60 minutes daily & at least 3 days a week** vigorous intensity aerobic activities with incorporation of those that strengthen muscles & bones.	Moderate to vigorous, mostly aerobic activity across the week & vigorous for at least three days.	NA	For Moderate activity **3 to < 6** For vigorous activity **≥6**
Adults living with Disability (18yrs & older)	**At least 150 to 300 minutes throughout the week. Or At least 75 to 150 minutes throughout the week. & at least 3 days a week** varied multicomp0nent physical activity that emphasizes functional balance and strength training at moderate or greater intensity.	Moderate aerobic physical activity Or Vigorous aerobic physical activity Or an equivalent combination of moderate and vigorous activity & varied multicomp0nent physical activity that emphasizes functional balance and strength training at moderate or greater intensity.	Muscle Strengthening activities at least 2 days in a week at moderate or greater intensity that involves all major muscle groups & For Additional Health benefit 300 minutes(moderate intensity) in a week Or 150 minutes (vigorous aerobic activity) in a week.	For Moderate activity **3 to < 6** For vigorous activity **≥6**

Source: WHO Guidelines on Physical Activity and Sedentary Behaviour, WHO, 2020, ISBN 978 -92- 4 -001512-8(ev) & 2018 Physical Activity Guidelines Advisory Committee Scientific Report. Washington, DC: U.S. Department of Health and Human Services, 2018.(Page: C6-C7).

* Light Intensity activity requires 1.6 to ≤ 3 METs.

* Sedentary Behaviour denotes energy expenditure ≤ 1.5 METs (Except Standing Quiet at 1.5 METs)

Appendix B

Sustainable Development Goals

Table B1

Seventeen Sustainable Development Goals

SL. No.	Goals
SDG-1	End poverty in all its forms everywhere.
SDG-2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
SDG-3	Ensure healthy lives and promote well-being for all at all ages.
SDG-4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
SDG-5	Achieve gender equality and empower all women and girls
SDG-6	Ensure availability and sustainable management of water and sanitation for all.
SDG-7	Ensure access to affordable, reliable, sustainable and modern energy for all.
SDG-8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
SDG-9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
SDG-10	Reduce inequality within and among countries.
SDG-11	Make cities and human settlements inclusive, safe, resilient and sustainable.
SDG-12	Ensure sustainable consumption and production patterns.
SDG-13	Take urgent action to combat climate change and its impacts.
SDG-14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
SDG-15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
SDG-16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
SDG-17	Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Source: UNO (21st October 2015), Transforming our world: the 2030 Agenda for Sustainable Development , A/RES/70/1

Appendix C

Gross Domestic Product(GDP growth) of Selected Countries

Table C1

Rank wise Gross Domestic Product (GDP) (Growth) in 2021

SL No.	Rank	COUNTRIES	GDP (Current US$) (Millions), year 2021
1	1st	United States	2,29,96,100.00
2	2nd	China	1,77,34,062.65
3	3rd	Japan	49,37,421.88
4	4th	Germany	42,23,116.21
5	5th	United Kingdom	31,86,859.74
6	6th	India	31,73,397.59
7	7th	France	29,37,472.76
8	8th	Italy	20,99,880.20
9	9th	Canada	19,90,761.61
10	10th	Korea Republic	17,98,533.92
11	11th	Russian Federation	17,75,799.92
12	12th	Brazil	16,08,981.22
13	13th	Australia	15,42,659.90
14	14th	Spain	14,25,276.59
15	15th	Mexico	12,93,037.87
16	16th	Indonesia	11,86,092.99
17	17th	Netherlands	10,18,007.06
18	18th	Saudi Arabia	8,33,541.24
19	19th	Turkey	8,15,271.75
20	20th	Switzerland	8,12,866.93
21	21st	Poland	6,74,048.27
22	22nd	Sweden	6,27,437.90
23	23rd	Belgium	5,99,879.03
24	24th	Thailand	5,05,981.66

Source: Website of the World Bank data-base, based on last up dated data on 20.07.2022.

Appendix D

Plagiarism Report

PROGRESS AND CONSTRAINTS OF HEALTH IN INDIA A CROSS COUNTRY ANALYSIS

ORIGINALITY REPORT

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Appendix E

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TRENDS IN MALNUTRITION AMONG THE UNDER FIVE YEARS CHILDREN OF INDIA

Kuntal Ghosh[1], Sanjib Mridha[2]
[1]*Research Scholar,* [2] *Professor, Department of Physical Education, Jadavpur University, West Bengal, India.*

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ABSTRACT

At least 1 in 3 children under 5 years (U-5) is not growing well in the World owing to malnutrition. Stunting, wasting, underweight, and overweight are important measuring indicators of malnutrition. Those indicators also reflect the population health of a country. India's economy is growing faster and already has emerged as the 5th largest economic country in the World. However, stunting, wasting, and underweight prevalence remain high in India. The purpose of this study is to find the trends of stunting, wasting, underweight, and overweight prevalence of U-5 children in India comparing its status with the Global average and to evaluate its status towards the Global target of Sustainable Development Goal (SDG) 2.2 by 2030. Data on stunting, wasting, underweight, and overweight prevalence of U-5 children are collected for 2010 to 2020 from the open website of WHO and the World Bank. The data from the reports of National Family Health Surveys (NFHS-3 to 5, India) are also considered for the study.

It is observed that India's average prevalence of stunting from 2010 to 2020 is 37.59%, which is higher than that of the World (24.55)%. However, India is accelerating its progress with an average annual reduction of 3.58%. Data on wasting and underweight of U-5 are very sporadic. India's wasting and underweight prevalence are found higher than that of the World average to available values in different years from 2010 to 2020. India's average overweight prevalence from 2010 to 2020 is much lower than that of the World's value (5.63%).

In the case of U-5 stunting and overweight prevalence, India will be closer - based on the average annual reduction rate - to the interim global target 2025 (adopted by WHA 2012) which was to reduce 40% stunting and not to increase the overweight prevalence but, India will be far away from the SDG 2.2 in all forms of malnutrition by 2030. An immediate acceleration of progress is required in the reduction of stunting, wasting, and underweight prevalence along with long-term future strategies to manage the growth of overweight prevalence to achieve the Global target (SDG 2.2) by 2030. Further in-depth research studies may be conducted having broader demographic features and on policy implementation.

KEY WORDS: ***Stunting, Wasting, Underweight and Overweight, Global target.***

INTRODUCTION

All the countries in the World are affected by either one or more forms of malnutrition. The greatest health challenge is to combat malnutrition in all its forms. Malnutrition comprises stunting, wasting and underweight (undernutrition), overweight and obesity, inadequate vitamins and minerals, and diet-related non-communicable diseases. The indicators of stunting, Wasting, Underweight, and Overweight prevalence are the important reflectors of the population health in India as well as in the World perspective (WHO, 2021). A child is considered to be stunted when its height-for-age is less than 2SD (Standard Deviation), a child whose weight-for-age is less than 2SD is considered underweight and a child is called wasted when its weight-for-height is less than -2SD (Jamison et al., 2006). A child under five is considered to be overweight when its weight-for-height is greater than + 2SD from the median(WHO, 2017).

Globally around 45% of deaths among children U-5 are linked to undernutrition. 1.9 billion adults in the world are overweight or obese and 462 million adults are underweight (WHO, 2021). Stunting, wasting, and overweight affected 148 million (22.3%), 45 million (6.8%), and 37 million (5.6%) of children under five respectively, in 2022 (WHO et al., 2023).

Undernutrition (with stunting and wasting) causes poor growth, infection, death, poor cognition, and poor school performance. Undernutrition (with stunting and underweight) causes perinatal complications, prematurity low birth weight, and chronic diseases for children in later life. Being overweight results in cardiovascular problems, infection, overweight, obesity and overweight and chronic diseases in for child in later life (UNICEF, 2019). Malnutrition increases healthcare costs, reduces productivity, and slows economic growth, which can prolong a cycle of poverty and ill health (WHO,2021).

Factors associated with malnutrition(Stunting, wasting, underweight & overweight) are the mother's nutritional status, anemia, lack of knowledge to feed children nutritionally, insufficient breastfeeding, early marriage and conception, short intervals between pregnancies, and Women's education and sanitation (Narayan, 2019).