CHAPTER 1
INTRODUCTION

1.1 URBANIZATION

India has a long tradition of urbanization with the cities of the Indus valley civilization. While looking back to 600 B.C, cities like Ayodhya and Indraprastha were built by the Aryans during the Vedic period. The treatise on Hindu architecture provides evidence of planned towns. In the medieval period, several small trading centres and industrial towns grew into large cities. During the British period, new colonial cities such as Kolkata, Chennai, Mumbai and Delhi were developed. After independence, many new towns and cities appeared with the development of industries, commerce and infrastructural facilities. The process of growing, spreading and developing the towns and cities, is known as urbanization.

Urbanization is a worldwide phenomenon. In some of the countries, this process is faster than other countries. In the context of India, this process got momentum after industrialization. Following are some of the definitions of urbanization given by geographers and other scholars.

1. G. T. Trewartha: The level of urbanization is defined as the proportion of total population residing in urban places.

2. G. Taylor: Urbanization is a shift of people from village to city.

3. E. E. Bergel: The conversion of villages into urban areas is known as the process of urbanization.

4. Kingsley Davis: Urbanization refers to the proportion of the total population concentrated in urban settlement or else to arise in this proportion. He also said “Urbanization represents a revolution change in the whole pattern of social life. It is itself a product of basic economy and technological development. It tends in turn, once it comes in to being, to affect every aspect of existence."

5. B.N. Ghosh: Urbanization is the process by which villages turn into towns and towns develop into cities.
In this way, urbanization is the shift from a rural to an urban society, and involves an increase in the number of people in urban areas during a particular year. Urbanization simply does not mean increase in number of urban people and increase in number of urban centre. The concept of urbanization specifically means a process involving an increase in the proportion of the population that is urban in relation to the increase of the total population as in relation to the proportion of non-urban population of a region. Therefore, urbanization can also be said as the outcome of social, economic and political developments that lead to urban concentration and growth of large cities, changes in land use and transformation from rural to metropolitan pattern of organization and governance.

Urbanization also finds expression mainly in outward expansion of the built-up area and conversion of prime agricultural lands into residential and industrial uses. The conversion of farm lands and watersheds for residential purpose have negative consequences on food security, water supply as well as the health of the people, both in the cities and in the peri-urban area.

Urbanization is a process which continuously goes on and on. More illusions are felt on the basis of specific determinants responsible for changes. Many factors such as geographical, economic, social, cultural and political determinants play a vital role. Cities serve as engines of growth in most developing countries by providing opportunities for employment, education, knowledge and technology transfer and ready markets for industrial and agricultural products. High urban population places enormous stress on natural resources and imposes 'ecological foot prints' on the peri-urban areas. (Rees, 1992 and Wackernagel. 1994)

Cities impact health in many ways. In the areas of the environment and health, problems of emission, supply of clean drinking water, sewage and rubbish disposal, food security and poverty reduction are the most important. Vulnerability of the urban population towards natural disasters and disease is more. Especially HIV/AIDS and atmospheric pollution have also been recognized as major problems in urban areas although data about pollution levels are fragmentary. The air and water quality in many cities threatens the health of millions of city residence. Thus urbanization process has both positive and negative impact on urban dwellers.
1.2 INDUSTRIALIZATION

According to Pred, A. (1965) industrialization is referred as a change in the social and economic activities of people, which involves a shift to manufacturing, innovation and the replacement of farming and other minor economic activities. The process of industrialization began in 1760s in Britain. There was marked growth in the population and the income that people gained during that period. Industrialization has featured more in the social and economic aspects of people. Urbanization was one of the major phenomena that transpired due to industrialization. Industrialization can be said as process of development which has structurally changed the methods of production and commodities based on scientific studies and research. (Vishvkosh)

The period between 1760 and 1830 is the beginning of industrial revolution in England. Major factors contributing to the industrial revolution were geographical location of England, trade with other countries, market, transportation, etc. The industrial revolution started with the textile industry and later on new things were added into manufacturing.

1.3 URBANIZATION AND INDUSTRIALIZATION PROCESSES

Many theories of development view urbanization and industrialization as essentially synonymous. In fact, the connection between the two is so strong that urbanization rates are often used as a proxy for income per capita (Acemoglu, Johnson & Robinson, 2002, 2005).

Between industrialization and urbanization a close high level positive co-relation is generally found. Industrialization in the western countries is the cause of urbanization. Industrial development also develops the instruments of transportation, trade, business, industries, services etc. The transportation sector had already developed before 20th century. Therefore, in the beginning of 20th century the speed of industrialization and urbanization was acute and rapid. 80% population lived in urban areas in industrialized countries in the beginning of 20th century. With the establishment of new industries, new towns were made. People from rural areas migrated to towns and cities to work in factories. This migration is in large number. This resulted into extension and development of cities.
The process of industrialization is different from the urbanization. Both of them are inspired by different things. Industrialization is the result of an expansion in the manufacturing process of a company. Industrialization was a shift in the manufacturing process that was influenced by a transformation in the technology and innovation spheres. The innovation and better ways of effecting the production of manufactured commodities led to industrialization.

The process of urbanization had its own inventions as well. People invented new ways to build better houses. Construction became sophisticated. Architectural and civil engineers found out better ways to make long lasting roads. Better means of transporting people were being discovered. Carriages continued to be refined for use by people. Walking became less stylish than using a carriage. City guards evolved to become administrative authorities who started to concern themselves over city planning and public health. Health centres came into the picture and the nursing profession was born. (Shafik. N, 1994)

As the inventions in industrialization led to better ways of manufacturing and transporting, urbanization led to inventions that aimed at a much more cosy life for the developing working class.

Urbanization without industrialization can be also found among some of those countries with particularly high urbanization rates but low shares of manufacturing and services in GDP. For instance, oil producing countries such as Brunei, Gabon, Libya, Kuwait, Qatar and Venezuela have high urbanization with less industrialization. (Gollin, D. 2016)

Thus urbanization and industrialization processes are complimentary to each other. They both have adverse impact on society.

1.4 BENEFITS TO THE SOCIETY AND COUNTRY

It is almost side-splitting that the advantages for both industrialization and urbanization are different. (Gollin, D. et al, 2015)

URBANIZATION BENEFITS

- Health care was more efficient and reliable
- Modernization led to the creation of jobs as well
- More cities developed
- People had dependable jobs and increased earnings
• Quality education was provided to sustain the needs of the industries
• The lifestyle of the people improved
• Urbanization is an important indicator of development for any country.

INDUSTRIALIZATION BENEFITS
• Industrialization led to the creation of jobs for the poor village peasants
• More industries were developed
• The GDP of the industrialized nations grew.
• The manufactured products sold at a cheaper price.
• The process of production was short, reliable and very effective.

1.5 CHALLENGES OF URBANIZATION & INDUSTRIALIZATION
Urbanization in the developing countries has affected the structure and functions of the various social institutions, which include the family, economy, policy, religion, health and education. Industrialization and modernization which are intertwined with urbanization have led to the diminished functions of the various institutions in urban centre. Urbanization has increased the poverty level in cities due to the alarming population growth of urban centres, and this is further aggravated by unemployment, underemployment, decrease in real wages due to persistent inflation and uncontrolled migration. The challenges of urbanization are felt in almost all the aspects of urban centres. Some of these challenges are discussed below.

• Housing: Many researchers have described the conditions of the housing where urban dwellers live in urban area as highly deplorable, overcrowding substandard building, poor sanitary conditions and lack of inadequate basic facilities, crime and poverty among other things. Some are even homeless there by sleeping around in different abandoned vehicles and buildings under bridges, in stores and so on. This is as a result of high housing rent and cost of land in urban centres which the rural migrants cannot afford.

• Crimes and Insecurity: The incidence of crime tends to increase in any region, where we have high population of people, and such incidence is reduced in a region with low population of people. Rapid urbanization, industrialization and
migration to the cities are major factor that contribute to higher crime rate. Robbery, child trafficking, fraud, political violence, kidnapping, rape, murder fake currency printing, other crime communal violence etc are prevalent in urban areas.

- Environment and Health problem: Environment related diseases or accidents remain among the major cause of illness, injury and premature death. Most of these diseases are caused by pathogens in water, food, soil or air. The link between environment and health is evident. Poor environment, housing and living condition are the main reasons to the disease and poor health. The lack of sanitation, sewage and different types of pollution are common in urban areas. Pollution of groundwater resources is one of the biggest problems. Groundwater has often proven to be a clean and reliable source of water, but now it is threatened due to a careless disposal of industrial wastes. The groundwater resources are also often taken for granted and not being protected. Water sources in urban areas are heavily contaminated with sewerage and other industrial pollutants. Rapid urbanization and migration has made urban areas congested. Poverty and absence of urban planning has further led to the development of slum from where human and household wastes are thrown into open areas and water sources increasing the risk of disease to population living nearby and in surrounding areas. These areas are becoming major reservoir of vector-borne disease, such as diarrhoea and typhoid. (Amis, P. & Kumar, S., 2000) Many are also exposed to arsenic contaminated ground water causing severe skin lesions and systematic manifestation like lung disease or neuropathy. A number of industrial effluents and emission especially toxic gases are spread into the air daily. Thus the environment is deteriorated to such an extent that it has crossed the critical limit and has become lethal to all organisms including man (Mazumbder, D. G. et al, 2010).

Indoor air pollution in the developing world is the most often associated with the use of biomass fuels such as coal, wood, animal dung, and kerosene. Indoor air pollution affects both rural and urban populations (Bruce et al, 2000).

"Brownfields" are a hazard in some cases to the poor who attempt to take up residence and are exposed to the chemicals previously used in the manufacturing processes. Cleaning up these Brownfield's is hampered by a lack of knowledge about contaminated land management (Butler, 1996)
Solid wastes: The volume of per capita waste is increasing with the income level due to higher consumption. This is a big problem in rapidly growing cities where it is really hard to keep up with the waste production. Authorities face enormous challenges managing solid waste mountains. On the other hand the solid waste generated from industrial sources contains a large number of chemicals, some of which are toxic. In some cities, industrial, residential and commercial areas are mixed and thus all waste gets intermingled.

Disease and Injuries: The major health related diseases found in urban areas are malaria, HIV/AIDS, tuberculosis and cardiovascular disease, dengue, chikungunya and diarrhoea. Additional challenges such as stroke, cancer, age related ophthalmic diseases, road traffic accidents and injuries have now become the leading cause of morbidity and mortality. Non communicable diseases such as diabetics, obesity, high cholesterol and abnormal blood pressure are also highly prevalent. Life style changes and demographic shift have increased the number of people suffering from alcoholism which are crucial risk factors increasing the possibility of suffering from cardiovascular disorder, stroke, cancer, mental health, depression and injuries such as burns, fractures, etc. (Chow, C. et al, 2007)

1.6 MEDICAL GEOGRAPHY

In India the period extending from about 600 B.C. to 400 A.D. is considered to be the creative period of Indian medicine. During this period Takshashila and Varanasi developed as great centres of medical research. Several books and monographs were written to elaborate, add or modify the medical knowledge contained in the Vedas. Atreya, the father of Indian Medicine says; "All suffering whether the body or mind, has its basis in ignorance. All happiness has its foundation in pure scientific knowledge." Susruta recognized three causes of disease: physical, environmental and natural.

After Indians the Greeks were supposed to be the first medical geographers to study the spatial pattern of diseases. In 400 B.C. probably Hippocrates was the first Greek person to emphasize about the spatial pattern of diseases in a temporal framework. Hippocrates was the first to have visualized relationship between the habits, physiques and weather conditions with disease in a person.
Disease, nutrition and medical (health) care are covered under the concept of medical geography. Medical geography is a branch of human geography related to health status and health care system. It is related to medical anthropology, medical sociology, health economics, epidemiology, zoology, botany, meteorology, parasitology, geology, urban planning, environmental engineering and biostatistics to make our understanding broad. It studies the health of the people. According to Meade and Erickson (2000), medical geography draws on the concepts and uses the techniques of all these disciplines and adds spatial and ecological perspectives. The idea that place and location can influence health is a very old and familiar concept. Environmental condition is the root cause of many diseases. Health of an individual is put in danger by organisms when internal and external environments are favourable for their multiplication. Internal environment means human body in which it grows and external environment means in which it originates. External environment is related to geographical and socio-culture environment (Misra. R. P, 1970).

Medical geography was first recognized as a formalized academic sub-discipline of geography in 1952, when the Commission on medical geography (Ecology) of health and disease gave its first report to the international geographic union (Meade & Earickson, 2000).

Today, medical geography is one of the fastest growing sub-disciplines of geography, and refinements in technology promise to continue to impact the field (Glass, 2000; Kamel Boulos et al, 2001). With increasing urbanization and industrialization, the issue of health and its study has attracted the attention of medical geographers. This study makes an effort to understand the impact of urbanization and industrialization on health of the workers. Such work is also carried out by multinational organization such as WHO and ILO at macro level. WHO defines health as "A state of complete physical, mental and social well-being, and not merely the absence of diseases or infirmity?" Further, the WHO regional office for the western pacific defines a healthy workplace as follows: "A place where everyone works together to achieve an agreed vision for the health and well-being of worker and the surrounding community." It provides all members of the workforce with psychological, social and organizational conditions that protect and promote health and safety. It enables managers and workers to increase control over their own health and to improve it.
At the same time, ILO report estimated that 2 million occupational fatalities occur across the world every year. (ILO, 2003b) The highest proportions of these deaths being caused by work related cancers, cardiovascular diseases and some communicable diseases. Recent data from International Labour Organization and World Health Organization indicate that overall occupational accident and disease rates are slowly declining in most industrialized countries (ILO, 2003a) but increasing in developing and industrializing countries.

The geography of health services is concerned with spatial aspects of access to health care, health care delivery, and the planning of health services. Medical geography is a holistic field that draws on the concepts, theories, and techniques of geography and other social and biophysical sciences. It spans the biological, environmental, and social sciences and uses both quantitative and qualitative methodologies.

1.7 OCCUPATIONAL HAZARDS

Bernardino Ramazzini (1633-1714) is regarded as the father of occupational medicine. His claim to that title result from his writing on Occupational disease which was published in his book namely De Morbis Artificum Diatriba in 1700. Ramazzini in his time noted the condition of work and the occupational disease of many traders as varied as miners, potters and soap makers.

The quality of human life is dependent on various natural and social factors like clean air, clear water, light, sunshine, equable temperature, nutritious food, peaceful surrounding, interpersonal relationships etc. Any deterioration of these factors can result in decline in the quality of life. Industrial activity is one of the leading instrumental causes of declined in quality of life. Following are the factors which affect the health of human being.

1.7.1 PHYSICAL FACTORS

These include excessive levels of noise, vibration, illumination, and temperature. Ionizing and non-ionizing electromagnetic radiation, are important tools in ensuring worker safety in occupations where there is exposure to ionizing radiation. Danger from radiation increases with the amount of time one is exposed to it; hence, less the time of exposure, less the radiation danger.
**Noise:** Continuous noise is produced by high-velocity air flow in compressors, fans, gas burners and motors. Crushing, drilling and grinding are important sources of continuous noise because a large amount of energy is used in a small place. The acute effects caused by noise depend upon the pressure and frequency. At high level of about 150db, immediate permanent hearing impairment may be caused. At sound levels in the range of 120-150 db, effects like dizziness, disorientation, loss of physical control, other physiological changes resulting in stress, nausea and vomiting may be caused. The major chronic effect of noise is the so-called noise-induced hearing loss. A person exposed to high noise level goes deaf more quickly than the one who is exposed to a relatively noise free environment during his day to day activities. This effect depends upon and increases with the pressure, frequency and the time of exposure.

**Heat:** Most of the industrial workers suffer from various hazards of heat. Continued prolonged exposure to heat as in heavy metal industries may lead to eye problems like irritation, watering, visual disturbance and blindness.

**1.7.2 CHEMICAL FACTORS**

Harmful chemical compounds in the form of solids, liquids, gases, mists, dusts, fumes, and vapours exert toxic effects by inhalation (breathing), absorption (through direct contact with the skin), or ingestion (eating or drinking). Airborne chemical hazards are born as concentrations of mists, vapours, gases, fumes, or solids. The adverse effects of a given exposure to a toxic material (chemical, cotton dust etc.) depends on the toxicity of substance and on the duration and intensity of contact with both long-term low level exposure and brief acute exposure and strive to characterize both.

There are four major routes of exposure

1. Direct contact with skin or eyes
2. Inhalation with deposition in the respiratory tract
3. Inhalation with deposition in the upper respiratory tract and subsequent transport to the throat and ingestion.
4. Direct ingestion of contaminated food or drink.
1.7.3 BIOLOGICAL FACTORS
These include bacteria, viruses, fungi, and other living organisms that can cause acute and chronic infections by entering the body either directly or through breaks in the skin. Occupations that deal with plants or animals or their products or with food and food processing may expose workers to biological hazards. Laboratory and medical personnel also can be exposed to biological factors. Any occupations that result in contact with body fluids pose a risk to workers from biological factors.

1.7.4 ERGONOMIC FACTORS
The science of ergonomic studies evaluates a full range of tasks including, but not limited to, lifting, holding, pushing, walking, and reaching. Many ergonomic problems result from technological changes such as increased assembly line speeds, adding specialized tasks, and increased repetition; some problems arise from poorly designed job tasks. Any of those conditions can cause ergonomic hazards such as excessive vibration and noise, eye strain, repetitive motion, and heavy lifting problems. Body posture is often related to stresses on the musculoskeletal system. To minimize postural stress, work station layout and work method should be developed. Unusually high stresses on muscles and joints are placed by jerky motions and sudden accelerations of objects.

1.7.5 EMOTIONAL FACTORS
One of the important emotional factors is stress. Stress at work place is considered a prime suspect in the etiology or exacerbation of many conditions, including gastric ulcers, hypertension, myocardial infarction, and musculoskeletal problem. In addition, work-related stress is thought to have negative effects on interpersonal relationships, job satisfaction and productivity at work as well as on life outside the workplace.

This study intends to contribute in the new areas of medical geography related to interrelationship among the process of urbanization, industrialization and disease pattern of workers with the following objectives.

1. To examine the demographic scenario of the city of Ahmedabad in Gujarat.
2. To review the process of urbanization.
3. To study the pattern and growth of industries.
4. To examine the study of basic facilities in Ahmedabad.
5. To assess the impact of industrialization on human health.
6. To know the type of disease, proportion and pattern of diseases in three GIDCs areas.

7. To formulate strategies for better health of urban residents.

The study focuses on health issues of urban worker and residence in three GIDCs areas of Ahmedabad.

1.8 ORGANIZATION OF THE WORK
The content of the present study has been divided into eight chapters along with bibliography and annexure.

CHAPTER 1. INTRODUCTION
This chapter has dealt with the conceptualization of urbanization, industrialization, process of industrialization and urbanization and listing the benefits and challenges of urbanization and industrialization. This chapter has made an attempt to explain the scope of medical geography and occupational hazards as the scope of the present research falls under medical geography. The research objectives of the study are also included in this chapter.

CHAPTER 2. LITERATURE REVIEW
This chapter has reviewed the work done on related topics by researchers and scholars. It is basically divided into three parts. The first part reviewed the work related to urbanization process. The second part looked into the work carried out on relationship between urbanization and health. The third part has assessed the process of industrialization and health.

CHAPTER 3. RESEARCH METHODOLOGY
This chapter covers research design, study area, data collection method, sampling techniques, sample size, tools for data analysis and limitations of the study.

CHAPTER 4. URBANIZATION TRANSDS AND PATTERN
This chapter has examined the trends and pattern of urbanization in the context of India, Gujarat and Ahmedabad.
CHAPTER 5. INDUSTRIAL PROFILE
This chapter has described industrial profile and pattern in the context of Gujarat and Ahmedabad.

CHAPTER 6. STATUS OF AMENITIES IN AHMEDABAD CITY
This chapter includes the assessment of spatial variation in basic services in Ahmedabad. Spatial variation is measured with the help of Gorard index. Choropleth maps were prepared to represent spatial variation in basic services.

CHAPTER 7. ANALYSIS OF FIELD SURVEY
This chapter has analysed primary data collected from workers working in GIDC and residents living near GIDC area. It has covered socio economic profile of respondents, their health status in terms of disease related symptoms, prevailing diseases, and their perception on environment and hygiene based on the primary data.

CHAPTER 8. FINDINGS, SUGGESTIONS AND CONCLUSION
This last chapter has summarized with conclusions of the research work and some recommendations for policy implementation with a view to strengthen the efforts of the government and society for better health of people.