Chennai District in Tamil Nadu is a medical hub for South Indian States. The research is carried out to find the linkages between and the role of Public Health and Pharmaceutical Industrial Development in Tamil Nadu.

6.1. THE STATEMENT OF PROBLEM

The eminent British historian Howard Sir Michael has made the point that peace is much more than the absence of war. A similar case can be argued with respect to health: as noted at the outset, it is clearly much more than the absence of disease. This ‘short introduction’ has sought to show that health is dynamic process: it changes across the life course, and it differs depending on historical and social circumstances. Such processes will obviously influence exposure to particular health risks and the experience of illness, including the use and outcomes of health care. Someone born in United Kingdom (UK) or the United States of America (USA) in 2005 will not experience the same health risks as someone born in those societies in 1905 or even 1955. To be born into a less developed society, even today, carries with its risks to health (for a crisis rarely experienced in the west. Periods of economic decline, political upheaval and war can cut across the health of individuals and the public in any society.

Tamil Nadu is a multilingual and multicultural society inhabited with un equal income groups. Obesity is a problem of rich and survival is a crisis of poor. The cry of the society altogether is cholesterol reduction, depression and diabetes. Simply the need of the hour is public health care. This has necessitated the genesis of a research problem – Public Health and Pharmaceutical Industrial Development in India – A Case Study of Tamil Nadu.
Edward A. Winslow has defined public health like “The science and the art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing sciences for the early diagnosis and preventive treatment of diseases, and the development of the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health”.

Hence, the thesis is evolved to find the role of pharmaceutical industrial development suiting to the needs of emerging diseases in Tamil Nadu.

6.2. HEALTH CARE SECTOR IN INDIA

By Roman times, it was well understood that proper diversion of human waste was a necessary tenet of public health in urban areas. The Chinese developed the practice of variolation following a smallpox epidemic around 1000 Before Christ (BC). An individual without the disease could gain some measure of immunity against it by inhaling the dried crusts that formed around lesions of infected individuals. Also, children were protected by inoculating a scratch on their forearms with the pus from a lesion. This practice was not documented in the West until the early-18th century, and was used on a very limited basis. The practice of vaccination did not become prevalent until the 1820s, following the work of Edward Jenner to treat smallpox.

During the 14th century Black Death in Europe, it was believed that removing bodies of the dead would further prevent the spread of the bacterial infection. This did little to stem the plague, however, which was most likely
spread by rodent-borne fleas. Burning parts of cities resulted in much greater benefit, since it destroyed the rodent infestations. The development of quarantine in the medieval period helped mitigate the effects of other infectious diseases. However, according to Michel Foucault, the plague model of govern mentality was later controverted by the cholera model. A Cholera pandemic devastated Europe between 1829 and 1851, and was first fought by the use of what Foucault called "social medicine", which focused on flux, circulation of air, location of cemeteries, etc. All those concerns, born of the miasma theory of disease, were mixed with urbanistic concerns for the management of populations, which Foucault designated as the concept of "biopower". The German conceptualized this in the Polizeiwissenschaft ("Police science").

The science of epidemiology was founded by John Snow's identification of polluted public water well as the source of an 1854 cholera outbreak in London. Dr. Snow believed in the germ theory of disease as opposed to the prevailing miasma theory. Although miasma theory correctly teaches that disease is a result of poor sanitation, it was based upon the prevailing theory of spontaneous generation. Germ theory developed slowly: despite Anton van Leeuwenhoek's observations of Microorganisms, (which are now known to cause many of the most common infectious diseases) in the year 1680; the modern era of public health did not begin until the 1880s, with Louis Pasteur's germ theory and production of artificial vaccines.

Other public health interventions include latrinization, the building of sewers, and the regular collection of garbage followed by incineration or disposal in a landfill, providing clean water and draining standing water to prevent the breeding of mosquitoes. This contribution was made by Edwin Chadwick in 1843 who published a report on the sanitation of the working class population in Great Britain at the time. So began the inception of the modern public health. The industrial revolution had initially caused the
spread of disease through large conurbations around workhouses and factories. These settlements were cramped and primitive and there was no organized sanitation. Disease was inevitable and its incubation in these areas was encouraged by the poor lifestyle of the inhabitants.

6.3. MODERN PUBLIC HEALTH

With the onset of the epidemiological transition and as the prevalence of infectious diseases decreased through the 20th century, public health began to put more focus on chronic diseases such as cancer and heart disease. Previous efforts in many developed countries had already led to dramatic reductions in the infant mortality rate using preventative methods. For instance in the United States, public health worker Dr. Sara Josephine Baker established many programs to help the poor in New York City keep their infants healthy, leading teams of nurses into the crowded neighborhoods of Hell's Kitchen and teaching mothers how to dress, feed, and bathe their babies.

During the 20th century and early in the next, the dramatic increase in average life span is widely credited to public health achievements, such as vaccination programmes and control of many infectious diseases including polio, diphtheria, yellow fever and smallpox; effective health and safety policies such as road traffic safety and occupational safety; improved family planning; tobacco control measures; and programmes designed to decrease non-communicable diseases by acting on known risk factors such as a person's background, lifestyle and environment. One of the major sources of the increase in average life span in the early 20th century was the decline in the "urban penalty" brought on by improvements in sanitation. These improvements included chlorination of drinking water, filtration and sewage treatment which led to the decline in deaths caused by infectious waterborne diseases such as cholera and intestinal diseases. In Cutler and Miller's, "The
Role of Public Health Improvements in Health Advances", they display evidence of the decline in typhoid fever deaths in Chicago, Baltimore, Cincinnati, and Cleveland after these American cities adopted chlorination, filtration, or a sewage improvement.

Meanwhile, large parts of the developing world remained plagued by largely preventable/treatable infectious diseases and poor maternal and child health outcomes, exacerbated by malnutrition and poverty. The World Health Organization (WHO) reports that a lack of exclusive breastfeeding during the first six months of life contributes to over a million avoidable child deaths each year. Intermittent preventive therapy aimed at treating and preventing malaria episodes among pregnant women and young children is one public health measure in endemic countries.

Front-page headlines continue to present society with public health issues on a daily basis: emerging infectious diseases such as Severe Acute Respiratory Syndrome (SARS), rapidly making its way from China to Canada, the United States and other geographically distant countries; reducing inequities in health care access through publicly funded health insurance programmes; the Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) pandemic and its spread from certain high-risk groups to the general population in many countries, such as in South Africa; the increase of childhood obesity and the concomitant increase in type II diabetes among children; the social, economic and health impacts of adolescent pregnancy; and the ongoing public health challenges related to natural disasters such as the 2004 Indian Ocean tsunami, 2005's Hurricane Katrina in the United States and the 2010 Haiti earthquake.

Since the 1980s, the growing field of population health has broadened the focus of public health from individual behaviors and risk factors to population-level issues such as inequality, poverty, and education. Modern
public health is often concerned with addressing determinants of health across a population. There is recognition that our health is affected by many factors including where we live, genetics, our income, our educational status and our social relationships - these are known as "social determinants of health." A social gradient in health runs through society, with those that are poorest generally suffering the worst health. However even those in the middle classes will generally have worse health outcomes than those of a higher social stratum. The new public health seeks to address these health inequalities by advocating for population-based policies that improve health in an equitable manner.

6.4. This study has gained significance in the following respects

1. To identify the relationship between the role of pharmaceutical industry and public health.
2. To signify the importance of outlays on research on public health.
3. To narrate the competition and product safety of pharmaceutical industry.
4. To rejuvenate profitability and power thoughts on marketing strategies.

6.5. This phenomenon has been chosen for the study due to the following reasons.

1. To estimate the all location of public funding in health care.
2. To study the development of pharmaceutical industry.
3. To study the importance of public and private partnership in health care.
Thus, uniqueness of the event, relevance of the phenomenon and appropriateness for the period of the study contributed to the choice of this research problem occurring the study period.

6.6. RESEARCH DESIGN

Public health and pharmaceutical industrial development in India is an inception of the thesis, time constraint and plethora of objectives restricted the thesis to Tamil Nadu. 200 respondents from pharmaceutical industry 200 respondents who are using their products and five industrial units are selected for the study. Data relating to employment, investment, employability, competition and market brands and shares to carry out the thesis in a regulated manner. The thesis is carried out with the following objectives are collected from the field survey.

6.7. OBJECTIVES

1. To study the allocation of public funding in health care.
2. To study the development of pharmaceutical industry.
3. To study the public and private partnership in health care.
4. And finally to study the relevance of the growth of pharma industry in Tamil Nadu along with healthcare practices.

6.8. HYPOTHESIS

1. Government spending is reduced on public health care
2. Pharmaceutical units are contributing extensively for the promotion of health care.
3. The researcher has applied simple statistical and mathematical tools for the analysis simple linear regression is used to validate the hypothesis.
6.9. PILOT STUDY

Based on a review of studies on Public Health and Pharmaceutical Industrial Development around Tamil Nadu, the researcher prepared a set of questions on the following aspects.

1. Pricing policies
2. Profitability
3. Competition and product safety
4. Outlays in research
5. Marketing and the introduction of Multi National Companies (MNC’s) in pharmaceutical industry.

Based on the preliminary survey, the researcher designed the tools and selected sources for data collection; questions on Public Health and Pharmaceutical Industrial Development in detail were set apart for interviews. On the other hand, questions pertaining to the development of public health and pharmaceutical industry were complied into the schedule for surveying with 400 respondents. Thus the methodology and design of the research were conceptualized based on the pilot study.

6.10. COLLECTION OF DATA

In Tamil Nadu Chennai District, Coimbatore District and Thiruchirapalli District are selected as field sample areas.

Therefore, to gain an understanding of the Public Health and Pharmaceutical Industrial Development, the researcher took up field trip to Indian Drugs and Pharmaceutical Industry, Orchid Pharmaceuticals, Tablets India Limited, TTK Health Care units.
6.11. TOOLS OF DATA COLLECTION

The researcher has developed three tools of data collection to gather data for this study. They are the following.

6.11.1. Schedule of employers

In order to conduct in depth interview with employer’s of pharma industry an interview guide was prepared. It covers the following:

1. Pricing policies
2. Competition and product safety
3. Outlays in research

6.11.2. Schedule of employees

The researcher designed a schedule for collection of data from employees. The schedule comprises the following:

1. Working schedule
2. Entry of Multi National Companies (MNC’s) in the field
3. Remuneration and duty schedule
4. Promotion and incentives
5. Training and skill promotion attitudes.

6.11.3. Schedule to patients using the brands

In order to ascertain the actuality with regard to the Public Health and Pharmaceutical Industrial Development the primary stakeholders viz., people have been consulted to provide the information. For this purpose a schedule was constructed consisting the following:

1. Source of knowledge of the product.
2. Reliability of the drug.
6.12. METHODS OF DATA COLLECTION

Survey method has been used to collect primary data for this research.

6.12.1. Primary Data

Primary data is collected from 400. Purposive random sampling technique issued to collect the data.

6.12.2. Secondary Data

Secondary data is collected from various books, magazines, published and unpublished research works, media and net.

6.12.3. Census Survey

Purposive random sampling technique has been adopted as the method of collection data in the following two cases:

1. Public health
2. Pharmaceutical Industry

6.13. ANALYSIS OF DATA

The data collected has been subjected to editing and coding by numbers and symbols. The data has been in relation to the variable and attributes studied.

Simple conventional methods are used in the study, percentages and exponential growth rates are worked out. Cost-benefit analysis, and linear regression analysis are used to test the hypothesis.
Arithmetic Mean

$$\bar{X} = \frac{X_1 + X_2 + X_3 + \ldots + X_n}{N}$$

$$\bar{X} = \frac{\sum X_i}{N}$$

Average Deviation

$$D_{\bar{X}} = \frac{|X_1 - \bar{X}| + |X_2 - \bar{X}| + \ldots + |X_n - \bar{X}|}{N}$$

$$D_{\bar{X}} = \frac{\sum |X_i - \bar{X}|}{N}$$

Linear Regression

\[
\text{Slope} = \frac{n \sum_i X_i Y_i - \sum_i X_i \sum_j Y_j}{n \sum_i X_i^2 - (\sum_i X_i)^2}
\]

\[
\text{Intercept} = \frac{(\sum_i X_i^2) \sum_i (Y_i) - \sum_i X_i \sum_i X_i Y_i}{n(\sum_i X_i^2) - (\sum_i X_i)^2}
\]

6.14. LOCATION OF THE STUDY

Tamil Nadu is one of the most important states in the country situated in the Southern part of India. It is bordered on the north by Andhra Pradesh state, on the northwest by Karnataka state, on the west by Kerala state, and on the east and south by the Bay of Bengal and the Indian Ocean. Occupying the extreme south of the Indian peninsula, Tamil Nadu has an area of 1,30,058 sq km.
The state of Tamil Nadu is divided into 32 Administrative Districts which in turn are further bifurcated into smaller divisions and subdivisions including a total of 17,272 villages. The state Capital, Madras now renamed as Chennai is the fourth largest city in the Indian sub-continent. It extends over an area of 174 Sq.km.

6.15. THE STUDY AREA

The study is carried out in Chennai District, Coimbatore District and Trichirapalli District of Tamil Nadu state with a specific focus on Public Health and Pharmaceutical Development. The three districts are endowed with medical tourism and mushrooming private health sector. Medications in private health units are costlier. Middle income group respondents are attracted by the Information Technology Companies and Business Process Outsourcing outlets for their survival. Low-income group respondents are working in small companies and unorganized sectors. These two categories of the respondents are earning their money income loaded with stress. Stress, changes in duty shifts, lack of adequate money income, burden of growing number in the family, birth preferences, food inflation are igniting health care issues.

Therefore, the researcher has selected public health care and Pharmaceutical industrial Development in Tamil Nadu as the thrust area.

6.16. LIMITATIONS OF THE STUDY

1. Investment outlays of private health care units are not studied.
2. Profit maximization strategies of pharma industries are not studied.
3. A study on bio-medical waste is an exemption of the study.
4. Extensive research of bio-technology is not covered in this study.
5. Government subsidies are not dealt because they are absent from 2007 onwards.
6. Role of public health inventories is an exception to the study.

6.17. CHAPTERIZATION SCHEME

1. The first chapter deals highlights on health care-A cross country analysis.
2. The second chapter deals with public health and pharmaceutical industrial development.
3. The third chapter deals with public and private participation in health care units.
4. The fourth chapter outlines a brief profile of study area and profile pharmaceutical industries.
5. The fifth chapter narrates review of literature.
6. The sixth chapter describes the methodology followed.
7. The seventh chapter deals with the economic analysis of the study.
8. And, the eighth chapter deals with summary and policy frame work.