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CHAPTER ONE
INTRODUCTION

1.1 INTRODUCTION

The health of the individual is closely related to the various geographical factors. There are various sub-disciplines which study the health of an individual and of society. Geography is one of them. Geographical factors are more influencing which determine the health of the individual and the community as well.

Medical geography is a systematic study of the spatial distribution of diseases, health and ill-health and the causes thereof. During the last few years, Medical Geography has acquired an increasing importance amongst the relatively newer fields of Geography.

Medical geography may be defined as the comparative study of the incidence of diseases and the distribution of physiological traits in people belonging to different areas and the correlation of these traits with pathological factors in relation to their respective geographical environment [May, 1950]. The pathological factors are causative agents, vectors, intermediate, hosts and reservoirs; while geographical factors are physical, human, social (socio-cultural) and biological factors.

In view of the above, the present study will deal with different environmental problems related to diseases in

urban areas of Kolhapur District of Maharashtra State.

To a medical geographer, geography in respect of pathogens is an important study; hence, the main aim of the medical geography is to analyse the geographical factors, which are responsible for the areal distribution of diseases and of health conditions. Thus, medical geography is concerned with the distribution of human diseases in relation to environment of society and of individuals.

1.2 AN OVERALL STUDY OF MEDICAL GEOGRAPHY

The term 'medical geography' has different shades or angles of meaning to different people. Medical Geography, Geography of Health, Geography of Life and Death are the synonymous terms. Here, the concept of health and disease is a very important aspect of human life.

Medical Geography is the systematic study of geographical factors or pathological factors. Medical Geography considers disease as a "maladjustment to the environment to which numerous factors contribute. Disease, therefore, becomes an anthoropological phenomenon with geographical distribution [Park and Park, 1986].

The World Health Organization (WHO) has expressed the definition of health as "Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity. It represents a relationship of the body and mind and complete adjustment to

the total environment". Disease has been defined as "A state which limits life in its power, duration or enjoyment". Disease is a departure from the state of health. It makes the change in living tissues which are essential for a living being inparticular of environment and hence, disease is nothing but a temporary maladjustment between man and his environment [Pandurkar, R.G., 1981]. But scientists in the medical field have not taken much cognizance of the relation between medicine and geography. It is only because of this, medical geographers who have concentrated their attention on the geographical factors which are responsible for the distribution of diseases and health conditions. Thus, the students of Medical Geography are related to environment disease occurrence in human life.

1.3 RESEARCHES IN MEDICAL GEOGRAPHY

The Commission of International Geographical Union has declared a separate status for the branch of Medical Geography, in Geography discipline in December, 1968. Medical Geography is a newly developing branch of Geography. Medical Geography is an inter-disciplinary branch of Medicine and Geography.

In the period of 4th century B.C. or A.D.? the influences of environment on the health of a man were known to the scientists. Hippocratus has mentioned in his article entitled "On airs, water and places, that man's health is directly exposed to the environment and the study of Medical

Table 1.1

Mid-year estimated population of Kolhapur District (Rural/Urban Area-wise) 1971 to 1991

Sr. No.	Years	Total			Rural			Urban		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
1.	1971	10,42,798	10,02,034	20,44,832	8,09,333	7,95,233	16,04,566	2,33,455	2,06,801	4,40,266
2.	1972	10,65,906	10,25,075	20,90,981	8,22,962	8,09,578	16,32,540	2,42,944	2,15,497	4,58,441
3.	1973	10,89,014	10,48,116	21,37,130	8,36,591	8,23,923	16,60,514	2,52,423	2,24,193	4,76,616
4.	1974	11,12,122	10,71,157	21,83,279	8,50,220	8,38,268	16,88,488	2,61,902	2,32,889	4,94,791
5.	1975	11,35,230	10,94,198	22,29,428	8,63,849	8,52,613	17,16,462	2,71,381	2,41,585	5,12,966
6.	1976	11,58,338	11,17,239	22,75,577	8,77,478	8,66,958	17,44,436	2,80,860	2,50,281	5,31,141
7.	1977	11,81,446	11,40,280	23,21,726	8,91,107	8,81303	17,72,410	2,90,339	2,58,977	5,49,316
8.	1978	12,04,554	11,63,321	23,67875	9,04,736	8,95,648	18,00,384	2,99,818	2,67,673	5,67,491
9.	1979	12,27,662	11,86,362	24,14,024	9,18,365	9,09,993	18,28,358	3,09,297	2,76,369	5,85,666
10.	1980	12,50,770	12,09,403	24,60,173	9,31,994	9,24,338	18,56,332	3,18,776	2,85,065	6,03,841
11.	1981	12,73,881	12,32,449	25,06,330	9,45,621	9,38,687	18,84,308	3,28,260	2,93,762	6,22,022
12.	1982	12,98,966	12,55,681	25,54,647	9,62,418	9,53,710	19,16,128	3,36,548	3,01,971	6,38,519
13.	1983	13,24,051	12,78,913	26,02,964	9,79,215	9,68,733	19,47,948	3,44,836	3,10,180	6,55,016
14.	1984	13,49,136	13,02,145	26,51,281	9,96,012	9,83,759	19,79,771	3,53,124	3,18,389	6,71,513
15.	1985	13,74,221	13,25,377	26,99,598	10,12,809	9,98,779	20,11,588	3,61,412	3,26,598	6,88,010
16.	1986	13,99,306	13,48,609	27,47,915	10,29,606	10,13,802	20,43,408	3,69,700	3,34,807	7,04,507
17.	1987	14,24,391	13,71,841	27,96,232	10,46,403	10,28,825	20,75,228	3,77,988	3,43,016	7,21,004
18.	1988	14,49,476	13,95,073	28,44,549	10,63,200	10,43,848	20,17,048	3,86,276	3,51,225	7,37,501
19.	1989	14,74,561	14,18,305	28,92,866	10,79,997	10,58,871	21,33,868	3,94,564	3,59,435	7,53,999
20.	1990	14,99,646	14,41,537	29,41,188	10,96,794	10,73,894	21,70,688	4,02,852	3,67,643	7,70,495
21.	1991	15,24,732	14,64,775	29,89,507	11,13,588	10,88,917	22,02,505	4,11,144	3,75,858	7,87,002

Source: Census Reports of Maharashtra State.

Geography is closely related with this environment.

Geographers have recently paid much attention to the development of Medical Geography. Realizing the importance of the study as of inter-disciplinary nature, many foreign geographers like Learmonth, A.T.A.; Howe, G.M.; Hunter, G.M., McGlanshan, N.D.; Stamp, L.D.; Pyle, G.F.; Mary, J.M.; Murray, M.A.; Light, R.D.; Brownlea, A.A.; Audy, J.R. and some others have shown much interest in the research in Medical Geography.

In India, Medical Geography is now in its initial stage. Prof.R.P. Mishra [1970] has published a book "Medical Geography of India", which helped Indian researchers in understanding the general information about Medical Geography. B.Bannerjee and J.Hazra, C. [1974] have worked on the 'Geo-Ecology of Cholera in West Bengal'. Dr.S.C.Sinha has contributed a paper on the trends of cholera epidemics in Uttar Pradesh at the 23rd International Geographical Congress held at Moscow. B.Hyma and A.Ramesh have contributed a joint paper on malaria in Tamil Nadu in the 23rd International Geographical Congress.

Research papers have also been published by the Indian geographers. Dr.R.Akhtar and N.Izhar worked on environmental factors and cancer distribution of India. Dr.R.G.Pandurkar's study on the "Spatial distribution of some diseases in Maharashtra" is a detailed study in a state at district level, while Dr.F.M.A.Shaikh's study on the "Spatial

Table 1.2
Mid-year estimated population of Kolhapur District (City-wise) 1971 to 1991

Sr. No.	Years	Kolhapur (M)			Ichalkaranji (M)			Jaysingpur (M)			Gadhinglaj (M)			Kurundwad (M)		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
1.	1971	1,37,180	1,21,870	2,59,050	47,689	40,042	87,731	8,981	8,154	17,135	7,595	7,068	14,663	7,513	7,097	14,610
2.	1972	1,41,395	1,25,812	2,67,207	50,145	42,187	92,332	9,321	8,501	17,822	7,791	7,259	15,050	7,630	7,227	14,857
3.	1973	1,45,610	1,29,754	2,75,364	52,601	44,332	96,933	9,661	8,848	18,509	7,987	7,450	15,437	7,747	7,357	15,104
4.	1974	1,49,825	1,33,696	2,83,521	55,057	46,477	1,01,535	10,001	9,195	19,196	8,183	7,641	15,824	7,864	7,487	15,351
5.	1975	1,54,040	1,37,638	2,91,678	57,513	48,622	1,06,135	10,541	9,542	19,883	8,379	7,832	16,211	7,981	7,617	15,598
6.	1976	1,58,255	1,41,580	2,99,835	59,969	50,767	1,10,736	10,681	9,889	20,570	8,575	8,023	16,598	8,098	7,747	15,845
7.	1977	1,62,470	1,45,522	3,07,992	62,425	52,912	1,15,337	11,021	10,236	21,257	8,771	8,214	16,985	8,215	7,877	16,092
8.	1978	1,66,685	1,49,464	3,16,149	64,881	55,057	1,19,938	11,361	10,583	21,944	8,967	8,405	17,372	8,332	8,007	16,339
9.	1979	1,70,900	1,53,406	3,24,306	67,337	57,202	1,24,539	11,701	10,930	22,631	9,163	8,596	17,759	8,449	8,137	16,586
10.	1980	1,75,115	1,57,348	3,32,463	69,793	59,347	1,29,140	12,041	11,277	23,318	9,359	8,787	18,146	8,566	8,267	16,833
11.	1981	1,79,332	1,61,293	3,40,625	72,250	61,501	1,33,751	12,383	11,629	24,012	9,555	8,980	18,535	8,686	8,398	17,084
12.	1982	1,82,612	1,64,586	3,47,198	76,391	64,479	1,40,870	12,868	12,119	24,987	9,759	9,160	18,919	8,884	8,583	17,467
13.	1983	1,85,892	1,67,879	3,53,771	80,532	68,457	1,48,989	13,353	12,609	25,962	9,963	9,340	19,302	9,082	8,768	17,850
14.	1984	1,89,172	1,71,172	3,60,343	84,673	72,435	1,57,108	13,838	13,099	26,937	10,167	9,520	19,687	9,280	8,953	18,233
15.	1985	1,92,452	1,74,465	3,66,917	88,814	76,413	1,65,227	14,323	13,589	27,912	10,371	9,700	20,071	9,478	9,138	18,616
16.	1986	1,95,732	1,77,758	3,73,490	92,955	80,391	1,73,346	14,808	14,079	28,887	10,575	9,880	20,455	9,676	9,323	18,999
17.	1987	1,99,012	1,81,051	3,80,063	97,096	84,369	1,81,465	15,293	14,569	29,862	10,779	10,060	20,839	9,874	9,508	19,382
18.	1988	2,02,292	1,84,344	3,86,636	1,01,237	88,347	1,89,584	15,778	15,059	30,837	10,983	10,240	21,223	10,072	9,693	19,765
19.	1989	2,05,572	1,87,637	3,93,209	1,05,378	92,325	1,97,703	16,263	15,549	31,812	11,187	10,420	21,607	10,270	9,878	20,148
20.	1990	2,08,852	1,90,930	3,99,782	1,09,519	96,303	2,05,822	16,748	16,039	32,787	11,391	10,600	21,991	10,464	10,063	20,527
21.	1991	2,12,141	1,94,229	4,06,370	1,13,667	1,01,283	2,14,950	17,235	16,531	33,766	11,602	10,784	22,386	10,665	10,252	20,917

Source: Census Reports of Maharashtra State.

Table 1.2 (contd.)

Sr. No.	Years	Kagal (M)			Pethvadgaon (M)			Murgud (M)			Malkapur (M)			Panhala (M)		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
1.	1971	6,927	6,501	13,428	5,680	5,245	10,925	3,824	3,664	7,488	2,310	2,223	4,533	1,205	1,014	2,219
2.	1972	7,089	6,650	13,739	5,859	5,416	11,275	3,883	3,717	7,600	2,325	2,238	4,563	1,225	1,034	2,259
3.	1973	7,251	6,799	14,050	6,038	5,587	11,625	3,942	3,770	7,712	2,340	2,253	4,593	1,243	1,054	2,297
4.	1974	7,413	6,948	14,361	6,217	5,758	11,975	4,001	3,823	7,824	2,355	2,268	4,623	1,265	1,076	2,341
5.	1975	7,575	7,097	14,672	6,696	5,929	12,325	4,060	3,876	7,936	2,370	2,283	4,653	1,281	1,092	2,373
6.	1976	7,737	7,246	14,983	6,575	6,100	12,675	4,119	3,929	8,048	2,385	2,298	4,683	1,285	1,096	2,381
7.	1977	7,899	7395	15,294	6,754	6,271	13,025	4,178	3,982	8,160	2,400	2,313	4,713	1,309	1,120	2,429
8.	1978	8,061	7,544	15,605	6,933	6,442	13,375	4,237	4,935	8,272	2,415	2,328	4,743	1,310	1,121	2,431
9.	1979	8,223	7,693	15,916	7,112	6,613	13,725	4,296	4,088	8,384	2,430	2,343	4,773	1,334	1,145	2,479
10.	1980	8,385	7,842	16,227	7,291	6,784	14,075	4,355	4,141	8,437	2,445	2,358	4,803	1,351	1,162	2,513
11.	1981	8,554	7,991	16,545	7,471	6,959	14,430	4,415	4,198	8,613	2,469	2,376	4,845	1,373	1,167	2,540
12.	1982	8,695	8,147	16,842	7,702	7,193	14,895	4,415	4,295	8,710	2,492	2,391	4,883	1,390	1,192	2,582
13.	1983	8,836	8,303	17,139	7,933	7,427	15,360	4,416	4,793	8,609	2,515	2,406	4,921	1,408	1,212	2,625
14.	1984	8,977	8,459	17,436	8,164	7,661	15,825	4,146	4,191	8,607	2,538	2,421	4,959	1,426	1,242	2,668
15.	1985	9,118	8,615	17,733	8,395	7,895	16,290	4,417	4,189	8,605	2,584	2,436	4,997	1,444	1,267	2,711
16.	1986	9,259	8,771	18,030	8,626	8,129	16,755	4,418	4,187	8,605	2,584	2,451	5,035	1,462	1,292	2,754
17.	1987	9,400	8,927	18,327	8,857	8,363	17,220	4,418	4,185	8,603	2,607	2,466	5,073	1,479	1,317	2,796
18.	1988	9,541	9,083	18,624	9,088	8,597	17,685	4,419	4,181	8,600	2,630	2,481	5,119	1,597	1,352	2,839
19.	1989	9,682	9,239	18,921	9,319	8,831	18,152	4,419	4,181	8,600	2,653	2,496	5,149	1,515	1,367	2,882
20.	1990	9,823	9,395	19,218	9,550	9,065	18,615	4,420	4,179	8,599	2,676	2,511	5,187	1,533	1,392	2,925
21.	1991	9,968	9,557	19,525	9,784	9,303	19,087	4,421	4,177	8,598	2,703	2,525	5,238	1,551	1,417	2,968

Source: Census Reports of Maharashtra State.

distribution of some diseases in cities of Solapur district" is a detailed study in a district and at city level. Now, the present work is an attempt at urban level in the district of Kolhapur.

1.4 CHOICE OF REGION AND PROBLEM

The researcher, in this dissertation, proposes to work on "Geographical Analysis of Diseases and Health Care Facilities in Urban Areas of Kolhapur District". The researcher has selected the urban among Kolhapur district with a specific purpose. As Medical Geography is concerned with study of areal distribution of diseases and its relationship to the existing environment, the physio-socio-cultural factors are the vital aspects, which serve to explain the spatial distribution and spread of certain diseases and other conditions of health.

Kolhapur District is located in the southern-most corner of Central Maharashtra and has latitudinal extent of 15°43' and 17°10' North and longitudinal extent of 73°40' and 74°42' East, with an area of 7,747 sq.kms. and a population of 29,89,507 as per 1991-Census. The urban population of the district is 7,87,002 which is 26.33 percent of the total population (fig.1.1).

The area under study comprises of 10 (ten) urban centres in Eastern part Kolhapur district, namely, (1) Kolhapur, (2) Ichalkaranji, (3) Jaysingpur, (4) Gadhinglaj, (5) Kurundwad, (6) Kagal, (7) Pethvadgaon, (8) Murgud, (9) Malkapur, and

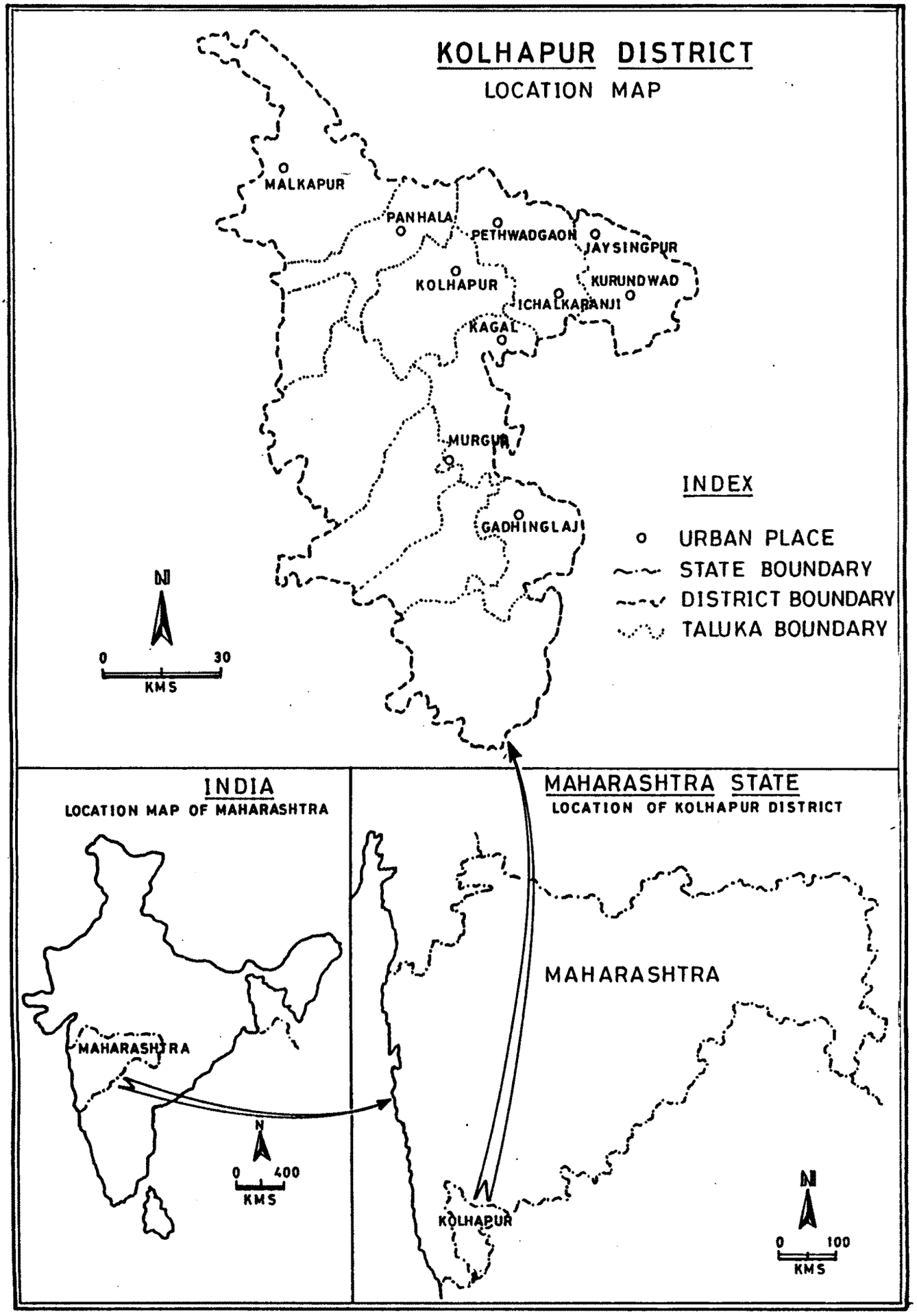
KOLHAPUR DISTRICT
LOCATION MAP
MALKAPUR
PANHALA
PETHWADGAON
JAYSINGPUR
KOLHAPUR
KURUNDWAD
ICHALKARANJI
KAGAL
MURGUD
GADHINGLAJ
INDEX
URBAN PLACE
STATE BOUNDARY
DISTRICT BOUNDARY
TALUKA BOUNDARY
N
0 30
KMS
INDIA
LOCATION MAP OF MAHARASHTRA
MAHARASHTRA
N
0 400
KMS
MAHARASHTRA STATE
LOCATION OF KOLHAPUR DISTRICT
MAHARASHTRA
KOLHAPUR
N
0 100
KMS

FIG.1-1

(10) Panhala.

The data used for this work is related to mortality and if possible, of morbidity of nine diseases, namely, (1) cholera, (2) dysentery and diarrhoea, (3) tuberculosis, (4) leprosy, (5) tetanus, (6) measle, (7) malaria, (8) cancer, and (9) pneumonia, for 20 years from 1971 onwards at urban level in Kolhapur district. The diseases which are easily spread from person to person or from animal to person and are caused by specific organisms are called 'Communicable Diseases'. These communicable diseases are studied citywise in Kolhapur District.

1.5 OBJECTIVES OF THE STUDY

The researcher in the present study has decided the following objectives:

(1) To map, describe and analyse the spatio-temporal distribution of selected diseases in the ten urban centres in Kolhapur District;

(2) To study the existing pattern of distribution of medical facilities in the urban areas and to suggest the probable new localization of facilities in the district as well as in the urban areas of the district.

In general, the aim of this study is to establish the relation of various environmental factors responsible for the distribution of different diseases spatially and temporally.

1.6 HYPOTHESES

(1) The physical factors such as relief and climate play a dominant role in disease distribution;

(2) The socio-cultural factors affect the disease distribution in urban areas of Kolhapur district;

(3) The health care facilities are unevenly distributed in urban areas of Kolhapur district;

(4) The health facilities are in deficit as per demands and needs of the population;

(5) The communicable diseases occur more in urban areas of Kolhapur district than its counterpart.

1.7 METHODOLOGY

The researcher proposes to analyse the available data at various stages. The collected data has been correlated with different physical and socio-cultural variables. As the data collected is for 20 years period, it has been analysed by mapping. The data is collected urban centre-wise and for the selected diseases. This data is processed by calculating the different rates and percentages, i.e. birth-rate, death-rate, cause-specific death-rate, infant mortality rate, still-birth rate, maternal mortality rate and also percentage of infant deaths to total deaths. The collected data has been classified and displayed through various cartographic techniques, i.e. line graph technique, bar graph technique, pyramid and disease ranking technique, for understanding the distributional pattern of diseases.

1.8 DATA SOURCES

The major task of a medical geographer is to portray the information which is related to space and he has to prepare the distribution map of morbidity and mortality. These maps are to be correlated with the environmental set up. For this, correct and reliable data are necessary. The researcher has collected data from different primary and secondary sources.

Data is collected from numerous sources. The area under study comprises of ten urban centres of Kolhapur district, so the researcher has collected the data from different primary and secondary sources.

The main sources of data will be the records of the District Health Office of Kolhapur and the District Statistical Office of Kolhapur and also the records of different municipalities in the district.

The data collected so far from the vital statistics and the records of different municipalities in the district is as follows:- it includes urban areawise deaths by different diseases, registered live births, registered deaths, registered infant deaths, vital statistical rates of major cities, registered deaths by age, registered deaths by causes, reported attacks and deaths by months, registered deaths by months, etc. The district census atlas, district gazetteers and town directory of Kolhapur district have also

been used for the data.

1.9 PROPOSED OUTLINE OF WORK

The entire work is divided into Five Chapters.

Chapter-I deals with the introduction, an overall study of Medical Geography, researches in Medical Geography , choice of region and problem, objectives and hypotheses of problem, methodology, data sources, etc.

Chapter-II deals with environment and its effect on the distrisbution of diseases, comprises the physical and socio-cultural factors which are responsible for the incidence, spread and distribution of communicable diseases in Kolhapur district. Certain physical factors have been correlated with the mortality rates so as to explain the spatial distribution and diffusion of certain diseases and other conditions of health.

Chapter-III deals with the pattern of infant mortality in urban areas of Kolhapur district, in which climatic effect on the occurrence of infant mortality are discussed. Infant mortality by age and sex and causes of infant mortality at city level are also discussed.

Chapter-IV deals with spatio-temporary distribution of urban diseases. The mortality data have been collected urban areawise of Kolhapur district from 1971 to 1990. In this Chapter, nine diseases have been selected, namely, (1) cholera, (2) dysentery and diarrhoea, (3) tuberculosis, (4) leprosy, (5) tetanus, (6) measle, (7) malaria, (8) cancer, and (9) pneumonia. These are studied in detail and the

trends of diseases mortality are discussed. Chapter-IV also deals with health care facilities in the urban areas of Kolhapur district where the author has attempted to study the spatial distribution of medical facilities in Kolhapur district.

Chapter-V deals with the summary of the work done and general conclusions and suggestions offered by the researcher.

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