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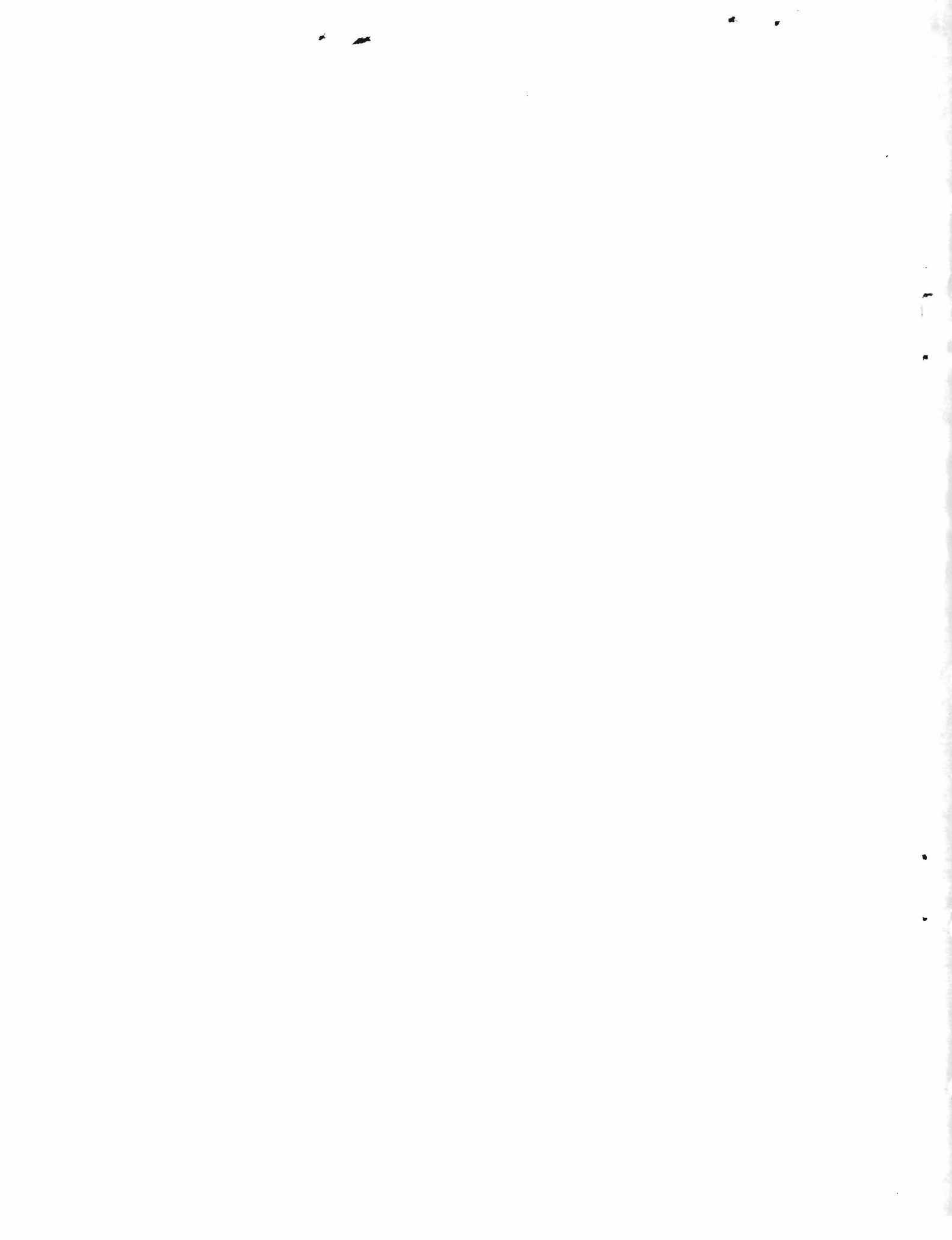
EPIDEMIOLOGICAL TRANSITION IN LATIN AMERICA: THE CASE OF CHILE

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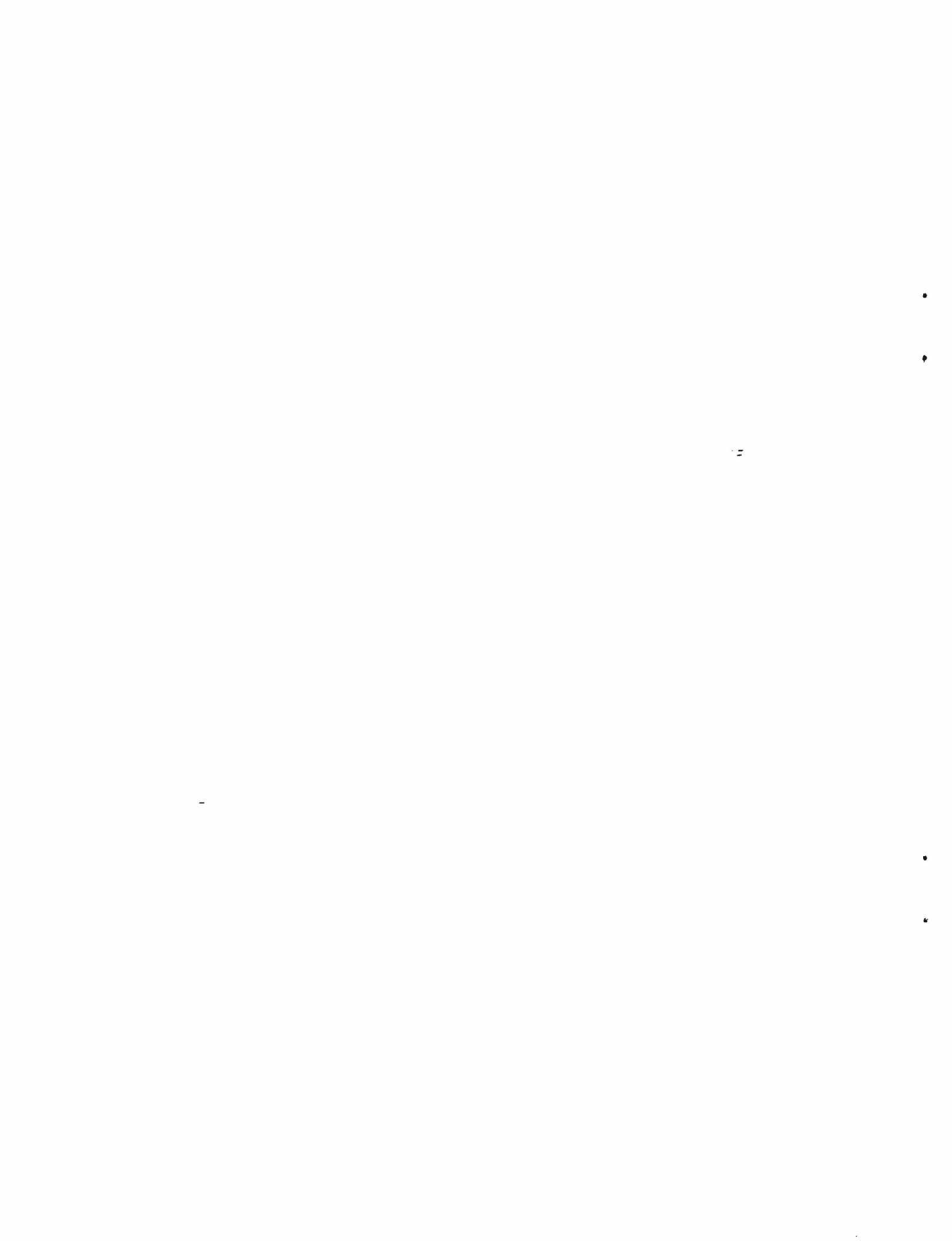
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Abstract

Aiming to describe the place that Chile has in the epidemiologic transition, a descriptive study of the changes in the demographic and epidemiologic profile in the country during the last twenty years is presented. The decline in Total Fertility Rate from 3.4 in 1970 to 2.6 in 1992 and the important decrease in General and Infant Mortality Rate, has led to an increase of Life Expectancy in 8 years in males and 9 years in females. These changes have produced modifications in age structure and causes of mortality, and correspondingly, of morbidity. A reduction of 82% in the proportion of deaths among less than one year old children and a 73% increase of mortality among 65 years and older is observed. In agreement with these changes, non-communicable diseases have increased from 53.7% of all deaths in 1970 to 74.9% in 1991. In the same period, mortality rates from cardiovascular causes have decreased from 189.6 to 161.1 per 100.000 inhabitants, while its relative participation among all causes has increased from 22.3% to 29%. High prevalence of risk factors should led to an important increase of chronic diseases in the next years. Regarding morbidity, persistence of high tuberculosis incidence rate, increase of digestive infections and sexually transmitted diseases, and decrease in immunopreventable diseases is noted. It is concluded that according to mortality, Chile is in a post transition stage, with a persistence of some infectious diseases, corresponding to a transition stage.





INTRODUCTION

In the last decades, Latin American countries have experienced important changes in health conditions based on demographic, socioeconomic and environmental conditions, such as the industrialization and urbanization process. Improvement in medical care as well as technological advances in the health sector has also been significant. Demographic changes from high levels to low levels of fertility and mortality has been called demographic transition¹. Demographic, socioeconomic and environmental changes produce transformations in the epidemiologic profile in the countries, in general with a reduction of communicable diseases and a progressive increase of chronic diseases and injuries as causes of mortality and morbidity. Coexistence of communicable diseases with chronic diseases and injuries as causes of death is the main characteristic of the epidemiological transition². Analysis of demographic and epidemiological changes are crucial to determine health policy in Latin American countries adequating the health systems to new epidemiological situations³.

The decreasing fertility and reduction of Infant Mortality Rate (IMR) in most of Latin American countries have produced an increase in life expectancy as well as an increase in population over 60 years old. As a consequence, there is a shift of evitable deaths from children to older ages, produced by different causes of death such as cardiovascular diseases, cancer, injuries and congenital and metabolic diseases⁴.

Chile is a country located in the western south of South America with more than 4,000 Kms of seaside to the Pacific Ocean and its continental territory has an area of 756,626 Sq. Km. The political administrative structure of the country has 13 regions and 335 districts. The total population of Chile is estimated for 1992 in 13,599,441 inhabitants of which the 49.45% are

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males. The 29.3% are younger than 15 years of which 11.0% goes from 0 to 4 years, a 49.0% range from 15 to 44 years while a 21.7% of the population is older than 44 years, being a 6.6% over 65 years.

The urban population reaches 83.5%. The Metropolitan Region, where Santiago, capital of the country is cited, concentrates the 40.5% of the population, followed by Bio Bio Region in the south of the country with a 12.4% and Valparaiso, sited in the central coast with 10.4%⁵.

Chile has an open market economy and it is placed in the group of countries of middle income economies. After two heavy recessions in 1975-1976 and 1982-1983, the trend seen in Chile's Gross Domestic Product (GDP) per capita has been characterized by a notable recovery in real terms. Chile has had a continuous economic growth in the last years with a growth of the GDP at an average rate of 6.4% per annum during 1990-1994. However, income distribution is skewed. The share in total income is 51.8% for the highest 20% of the population, and only 6.5% for the lowest 20% of the population.

Chile's social development is impressive. While a GNP per capita of US\$2,726 in 1992 places Chile among middle-income countries, its social indicators closely resemble those of an industrialized country. Public investments since the 1920's in health and nutrition, as well as basic education and potable water and sanitation, have had a significant impact in reducing the incidence of communicable diseases and malnutrition, playing a decisive role in overall health improvements⁶.

Chile has had a huge decrease in IMR caused by diarrhoeal and respiratory diseases in the last twenty years, more than double that most of Latin American countries⁷. This decrease has

produced a rapid change in the epidemiological profile of the country increasing the noncommunicable diseases from 53.7% of all deaths in 1970 to 75.1% in 1990.

In relation to mortality, the Chilean epidemiological pattern, is close to developed countries, in which chronic diseases are 70 to 80% of all deaths⁵. Regarding morbidity, Chile has still high rates of digestive infectious such as hepatitis and typhoid fever, AIDS and sexually transmitted diseases, and persistence of high tuberculosis incidence rate⁶. This special situation will be reviewed in the current study.

The objective of the study is to analyze the Chilean epidemiologic profile in relation to the epidemiological transition stages.

METHODS

This is a descriptive, population based study, to analyze mortality and morbidity trends in the last twenty years in Chile, including main demographic and socioeconomic variables.

Source of data

Secondary data was collected from official information. For mortality analysis Annual Demographic Reports of the National Institute of Statistics (INE)^{9,10,11} and population data projections from the same Institute and United Nations Latin America Demographic Center (CELADE)^{12,13} were utilized. Information arising from Ministry of Health^{6,12}, Pan American Health Organization (PAHO.WHO)^{15,16,17}, The World Bank¹⁸ and United Nations (UN)¹⁹, were also used.

Variables

Demographic and socioeconomic changes were analyzed with the following variables: life expectancy at birth, birth rates, crude and adjusted mortality rates, proportional mortality, fertility rates, age structure of the population, and population growth rate.

Socioeconomic data variables were urban and rural distribution, Geographic Domestic Product (GDP) per capita, water and sanitation, literacy and food availability.

For mortality analysis, specific causes by group of age and causes were defined by the International Classification of Diseases (ICD). Until 1981 defunctions causes by group of age were published according list A of the International Classification of Diseases, eighth revision (ICD-VIII)²⁰, and since 1982 according to the detailed list of 999 causes of the International

Classification of Diseases Ninth Revision (ICD-IX) ²¹. For this study, both revisions were compatibilized.

For comparative analysis, broad causes of mortality were grouped in three groups: Group I "Communicable diseases and maternal and perinatal causes" including all deaths from infectious diseases listed in ICD-9, plus influenza and pneumonia, nutritional disorders and anemia, maternal causes of death (including abortion), and perinatal causes of death. Group II "Injuries" include ICD-9, Section XVII E. Group III: "Noncommunicable diseases" include all other causes of death¹⁸.

According to WHO specifications about the quality of the data, ill defined causes (780-799) are also mentioned. The study of rate tendencies of ICD-IX major group of causes was developed using adjusted mortality rates for 1982 Chilean population. With the aim to stabilize the rate comparison, biannual rates were utilized.

Specific mortality rates by groups of age and groups of causes, and incidence rates of some infectious diseases are also analyzed.

RESULTS

Among Latin American countries, Cuba, Chile and Costa Rica present the lower Infant Mortality Rates (IMR). These values are almost a third of the average in Latin American countries, but is still twice the rate in high-income economies.

Despite a relatively low GDP per capita, IMR declined in Chile from 82.2 per thousand in 1970 to 14.3 in 1992 (- 82.2%). This decrease has been double of the decrease in all Latin American and Caribbean countries, in the same period of time (-46.3%) (Table 1).

Chile has suffered a progressive urbanization process since the thirties, with a 83.5% of the population living in urban areas in 1992. Despite GDP per capita had not changed dramatically in the last 20 years (only in 1993 was over US\$ 3000), literacy, water and sanitation coverage in urban areas and health expenditure per capita have been increasing steadily (Table 2).

In the last 20 years, General Mortality Rate has decreased, but Natality and Total Fertility Rate have been maintained after a decrease in the 70s. As a consequence, there has been an extension of Life Expectancy at birth, an increase of 2.6 years in the Median of Age with a stable population growth in the period (Table 3). However, population structure by groups of age has changed drastically: 39.2% of the total population was in the age-group 0 - 14 years in 1970, decreasing to

29.4% in 1992. In the age-group 65 years and older, population increased from 5% in 1970 to 6.6% in 1992. The proportion of deaths by groups of age has also changed dramatically: 31.8% of all deaths occurred in the age-group 0 - 14 years in 1970, decreasing to only 7.8% in 1992. On the other hand, 34.6% of all deaths occurred over 65 years in 1970, increasing to 60% of all deaths in 1992 (Table 4).

Perinatal Mortality Rate (PNMR) has decreased steadily since 1970, as well as Mortality under-5 per 1000 live births (MR<5). The ratio MR<5/PNMR has decreased to be close to 1, alike the relation observed in developed countries. Maternal Mortality Rate (MMR) has decreased rapidly, simultaneously with the increasing coverage of institutionalized births to almost 100% in 1992 and despite public health expenditure as a percentage of GDP, has been maintained over time. Total health expenditure and health expenditure per capita have increased in the same period of time (Table 5).

Perinatal diseases have been maintained as the main cause of death in the group under 1 year old. However, diarrhoeal diseases and nutrition deficiencies have been significantly reduced as causes of death in the last 20 years. Congenital diseases moved from the fifth to the second place as cause of death in the same period. Regarding IMR, Chile was in a pre-transition stage in 1970 with a high proportion of deaths caused by diarrhoeal and respiratory diseases. As a consequence, the pattern of mortality in infants has changed to a post-transition stage in the last twenty years (Table 6).

In the pattern of mortality for all ages in 1970, infectious and parasitic diseases were 11% of all deaths; in 1992 the proportion decreased to 2.9%. The same change was seen in perinatal diseases from 5% of all deaths in 1970 to 1.9% in 1992. Cardiovascular diseases and malignant tumours

are in the first places and both have increased as a proportion of causes of death. Injuries have decreased from 19 to 12% in the last 20 years (Table 7). In agreement with these changes, non-communicable diseases have increased from 53.7% of all deaths in 1970 to 75.1% in 1990 (Figure 1).

In the case of cardiovascular diseases, rate decreased from 189.6 in 1970 to 161.1 per 100.000 in 1992, while its relative participation among all causes has increased from 23.2% to 29.0% in the same period. The rate from coronary heart diseases has decreased from 97.2 in 1970 to 80.6 per 100.000 in 1992; however, for cerebrovascular diseases the rate has been maintained in the last twenty years (Figure 2). Total cardiovascular and ischemic deaths in the 35 to 74 year age range has also decreased.

Malignant tumours have increased from 8% in 1970 to 20% in 1992 of the total causes of death. The age adjusted mortality rate from cancer reached 102.6 per 100.000 inhabitants in 1990. Mortality rates for 15 years and over are shown in Table 8. Stomach cancer is the leading cause of cancer deaths in Chile, but its prevalence has decreased in almost 50% in the last 20 years. On the other hand, gall bladder cancer has increased in a 115% in the same period of time. The decline (-24.3%) of mortality by cancer of the cervix could be explained by an spread of the official programme of free Pap smears. The great decline of mortality from malignant neoplasms of stomach and the steep increase of cancer from the gall bladder, are shown on Figure 3.

Regarding infectious diseases, despite mortality and morbidity have decreased, there is a persistence of high tuberculosis incidence rate (49.3 per 100.000 in 1990), gonorrhoea and syphilis (92.5 per 100.000), and hepatitis and typhoid fever (128.7 per 100.000). Immunopreventable

diseases have decreased significantly in both mortality and morbidity in the last 20 years, but morbidity is still high (Figure 4).

DISCUSSION

The change produced in the pattern of disease proceed in two steps. The first is demographic transition, when mortality from infectious diseases declines and, partly as a result, fertility decreases as well. In the second, a consequence of declining fertility and differential rates of decline among causes of death, a coexistence of chronic diseases with infectious diseases as causes of ill health is produced. This situation is called epidemiologic transition. Some countries are in the pre-transition stage with adverse environmental conditions, with lack of potable water and sewage, high incidence of infectious diseases (diarrhoeal and immunopreventable diseases), malnutrition, tuberculosis and malaria. Countries in the pre-transition stage have high fertility and mortality, illiteracy and low GDP per capita. Haiti, Bolivia and some Central American countries are in this situation, and Chile was in a pre-transition stage until the 70s, when the improving of coverage in education, water and sanitation systems, immunizations, family planning, births in maternities, and nutrition programs produced a rapid decline in IMR, maternal mortality rate and malnutrition²².

When environmental conditions are improving, and fertility and mortality decrease as a consequence of health programs, countries are in the transition stage. In this stage, risk factors for chronic diseases (alcohol, drugs and tobacco consumption, inadequate diet, lack of exercise, and others) increase because of the urbanization process. The population gets older, and the first causes of death are chronic diseases (cardiovascular, cancer) and injuries, but infectious diseases

are still important. This is the situation of most of Latin American countries, and Chile was in this stage in the 70s and 80s. In Chile, the rapid decrease of diarrhoeal diseases, infectious diseases and malnutrition produced a change in IMR causes of death: at the end of the 80s perinatal diseases and congenital malformations, followed by respiratory diseases and trauma were the main causes of death in 1990 (Table 7). This pattern is similar to the infant's pattern of death in developed countries. With the decrease of malnutrition, other problems appear as important causes of illness in children, such as micronutrients deficiency (anemia, goiter, growing deficiencies arising from lack of calcium, zinc, copper, fluor) and metabolic and congenital diseases.

Despite cardiovascular diseases are decreasing, they are the first cause of death. The risk of death by malignant tumours has increased in particular for cancers related to life style (diet, tobacco), such as gall bladder, prostate, breast, and lung. Besides, and similar to what is happening in developed countries, mental disorders appear as important causes of morbidity, disability and risk factors for chronic diseases (tobacco consumption, alcoholism, and drug addiction, with violence and injuries as sequelae).

In relation to risk factors, alcohol consumption is a common habit in the population: 70% of adults consume alcohol, 20% of adult men are considered excessive drinkers with a 5% of alcoholics⁶. Smoking affects 37.9% of men and 25.1 of women. Obesity has also a high prevalence: 13.2% of men and 22.7 of women are obese, particularly in low socioeconomic level; and lack of exercise is the norm in Chile²³. In general, diet fit international recommendations: 60-65% of carbohydrates, 12-18% of proteins and 20-25% of fat, with an adequate relation of saturated and non-saturated fat. The pattern of fat consumption and lipid

profiles is different according to socioeconomic levels: in high socioeconomic level fat consumption and hyperlipidemias are higher than in low socioeconomic levels²⁴.

Adjusted mortality rates to U.S. population show a lower mortality from cardiovascular diseases in Chile (ratio=0.6), lower ischemic heart disease but a higher one from cerebrovascular diseases in all age groups compared with those reported in U.S.²⁵. The lack of preventive programmes for early detection and treatment of hypertension, and differences in the prevalence of risk factors such as diet, hyperlipidemia, and smoking may underline this different mortality pattern from cardiovascular diseases between U.S. and Chile^{23,24,25}.

There is no explanation for the stomach cancer mortality decrease, which seems to be a worldwide phenomenon. A number of studies have found that gallbladder cancer is much more common in Chile than in other countries and this fact does not correspond to misclassification. The great majority of cases of gallbladder cancer are diagnosed in the hospitals by surgical biopsy which assures the correctness of the diagnosis. On the other hand, medical certifications of gall bladder cancer deaths (ICD-9 156) is 99.7%. The most significant risk factor for gallbladder cancer is gallstone disease, a prevalent condition in the country. Although no apparent changes in the prevalence of gallstone disease has occurred during the last decade, cholecystectomy rates have consistently decreased during the decade, specially among young women^{26,27,28}. No international information has been found of an increase in gall bladder cancer mortality like the one shown in Chile. The high prevalence of gallstone disease, particularly among women, and deterioration in the timely surgical elimination of the gallbladder, in the last two decades, may explain this phenomenon^{6,29}. Breast cancer follows the trend observed in developed countries. There seems to be an increase in estrogen treatment of menopause which could explain the increase in breast

cancer in older women. However, other risk factors like fewer children, first children at older ages, lack of breastfeeding and obesity have also been associated with breast cancer²⁹.

In general, the epidemiological profile of mortality in Chile is in the post-transition stage. But in morbidity there are still high incidences of TB and some infectious diseases such as typhoid fever and hepatitis, with the maintenance of high incidence of Sexually Transmitted Diseases (STD) and the increasing incidence of AIDS.

A drastic reduction of IMR in a short period of time occurred in Chile between 1970 and 1992. Changes were produced by a decline in infant mortality by diarrhoeal and respiratory diseases, as well as a decline in maternal mortality rate and malnutrition, in a period of rapid demographic and socioeconomic changes. Now, in the 90s, with the urbanization process and the extension of life length, there exists a predominance of chronic diseases with a pattern of mortality according to the post-transitional stage, but some infectious diseases corresponding to a transition stage, are still present.

It is concluded that according to mortality, Chile is in a post transition stage, with a persistence of some infectious diseases, that corresponds to an epidemiological transition situation.

The Chilean situation has been different to other Latin American countries where a "prolonged or lengthy model" is the characteristic, with a lack of resolution of the transition process so that the countries appear to be caught in a state of mixed morbidity and mortality².

However, the rapid change from a pre-transition to a post-transition stage in Chile has not been accompanied with an adequation of the health system model. The Chilean health system is still caught in the pre-transition model, with most of the programs focused in maternal and child programs, without a health policy and programs related to other population groups. The absence

of preventive programs for chronic diseases in Chile is a high risk situation for the country in the next ten years. Different experiences in developed countries have demonstrated that chronic diseases can be prevented introducing changes in the lifestyle of the population. Decreasing alcohol and tobacco consumption, improvements in diet and physical activity, and reduction of obesity are important challenges for developing countries in epidemiologic transition.

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FIGURE 1. Changes in proportion of major groups of causes of death in Chile, 1970 and 1990.

FIGURE 2. Mortality by cardiovascular diseases, coronary heart diseases, and cerebrovascular diseases in Chile, 1970 - 1992. Rate per 100.000 inhabitants.

FIGURE 3. Stomach and gall bladder cancer. Mortality rates per 100.000 15 years and over, by sex. Chile, 1968 - 1990.

FIGURE 4. Incidence of infectious diseases in Chile. Tuberculosis, Gonorrhoea & Syphilis, Hepatitis & Typhoid Fever, and Immunopreventable Diseases, 1980 - 1990. Rate per 100.000 inhabitants

TABLE 1. Infant Mortality Rate and Geographic Domestic Product per capita in selected Latinamerican and developed countries 1970-1991.

COUNTRIES	IMR*		% CHANGE	GDP p.c. † US\$ 1991
	1970	1991		
CHILE	82.2	14.6	-82.2	2160
CUBA	38.7	12.0	-69.0	not available
COSTA RICA	62.0	14.0	-77.4	1850
VENEZUELA	53	34	-35.8	2730
NICARAGUA	106	56	-47.2	460
HAITI	141	95	-32.6	370
LATIN AMERICA & CARIBBEAN	82	44	-46.3	2390
HIGH-INCOME ECONOMIES	20	8	-60.0	21050

* IMR - Infant Mortality Rate

† GDP p.c. - Geographic Domestic Product per capita

Sources: The World Bank - World Development Report 1993 - Washington, D.C.

WHO/PAJIO. Health Conditions in the Americas, 1990 Edition. PAJIO Scientific Publication No. 524.

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TABLE 2. Chile: socioeconomic changes 1970, 1982, 1992.

	1970	1982	1992	% Change 1970-1992
% urban population	75.1	82.2	83.5	+ 11.2
% urban dwellings with drinking water	58	87	95.2	+ 64.1
% urban dwellings with sewers	35	62	84.4	+ 141.1
% adult illiteracy	11.0	8.2	5.7	- 48.2
GDP p.c. * US\$	2230	2148	3020†	+ 35.4
Health expenditure per capita US\$	52	76	116	+ 123.1

* GDP p.c.: Geographic Domestic Product per capita.

† 1993

Sources: INE Demographic Annual Report 1992

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The World Bank. World Development Report 1993. Washington, D.C

WHO/PAHO. Health Conditions in the Americas, 1990 Edition. PAHO Scientific Publication No. 524.

WHO/PAHO. Health Conditions in the Americas, 1985-86 Edition. PAHO Scientific Publication No. 500.

TABLE 3. Chile. components of demographic changes. 1970, 1982, 1992.

Year	Natality Rate	IMR*	Total Fertility Rate	GMR †	Life expectancy		Median of age	% Pop Growth §
1970	26.4	82.2	3.4	8.7	60.5	66.8	27.5	1.8
1982	23.8	23.6	2.8	6.1	67.8	74.8	29.3	1.8
1992	21.6	14.3	2.6	5.4	68.7	75.8	30.1	1.6

* IMR : Infant Mortality Rate

† GMR : General Mortality Rate

§ % Pop Growth : % Population Growth

Source: INE Demographic Annual Reports 1970, 1982, 1992.

TABLE 4. Proportion of population and deaths by groups of age. Chile, 1970, 1982, 1992

GROUPS OF AGE (years)	% POPULATION				% DEATHS			
	1970	1982	1992	% Change 1970-1992	1970	1982	1992	% Change 1970-1992
0-14	39.2	32.2	29.4	- 25.0	31.8	13.4	7.8	- 75.5
15-64	55.8	62.0	64.0	+ 14.7	33.6	34.4	32.2	- 4.2
65+	5.0	5.8	6.6	+ 32.0	34.6	57.2	60.0	+ 73.4

Sources: INE, Demographic Annual Report 1992

INE, Chilean Women, Radiograph in Numbers, 1994

TABLE 5. Economic and biomedical indicators Chile 1970, 1980, 1992.

Indicators	1970	1980	1992
IMR*	82.2	32.0	14.3
PNMR†	38.3	22.0	12.4
MR<5/ 1000 L.B‡	92.9	38.0	18.1
MR<5:PNMR	2.43	1.73	1.46
MMR§	1.72	0.40	0.31
% Institutionalized Births	85.1	96.5	99.2
Public Health Exp. (%GDP)¶	2.8	2.1	2.5
Total Health exp. (%GDP)	3.3	3.4	5.5
Health Exp. US\$ (1991) per capita	52	76	116

- * IMR : Infant Mortality Rate
† PNMR : Perinatal Mortality Rate
‡ MR<5/ 1000 L.B. Mortality Rate under 5 years old per 1000 Live Births.
§ MMR : Maternal Mortality Rate
¶ GDP : Geographic Domestic Product

Sources: INE: Demographic Annual Reports 1970, 1982, 1992.
The World Bank: World Development Report 1993. Washington, D.C.

TABLE 6. Main causes of defunctions in the group under 1 year old. Proportion of total deaths < 1 year. Population under 1 year old. Biennial means. Chile 1970-1992

Causes of death	1972-73 %	1975-76 %	1977-78 %	1979-80 %	1989-90 %	1991-92 %
Perinatal	32.0	29.9	28.7	32.6	34.6	33.7
Congenital	4.5	6.2	7.6	11.2	22.9	26.5
Trauma	4.8	2.9	3.5	4.9	14.8	25.1
Respiratory	25.7	20.5	16.8	16.3	15.7	14.6
Diarrhoea	14.2*	10.9	10.7	6.9	1.6	1.4
Nutr Def †	4.1	4.6	3.9	2.4	0.45	0.52
Total Deaths < 1y ‡	18628	14045	10332	8528	5184	4297

* Mean 1971-74

† Nutr Def - Nutrition deficiencies

‡ Total Deaths under 1 year old

Source: INE: Demographic Annual Reports 1971-1992

TABLE 7. Defuncions by groups of causes. Proportion of total deaths. Chile. 1970, 1982, 1992.

Groups of Causes	1970*	1982†	1992†
Cardiovascular diseases (390-459)† (A80-88)*	22.3	27.6	29.0
Malignant tumours (140-208)† (A45-59)*	12.0	16.8	20.0
Injuries (800-999)† (AV138-150+AE138-149)*	19.0	12.1	12.0
Respiratory (460-519)† (A89-96)*	17.4	8.5	11.1
Digestive (520-579)† (A97-104)*	6.9	8.6	6.3
ill defined (780-799)† A137*	4.5	8.8	5.6
Infectious and parasitary (0-139)† A1-44*	10.9	3.8	2.9
Perinatal causes (760-779)† A131-135*	5.0	3.5	1.9
All others	2.0	10.3	11.2
Total	100.0	100.0	100.0

* ICD-VIII

† ICD-IX

Source: INE Demographic Annual Reports 1970, 1982, 1992

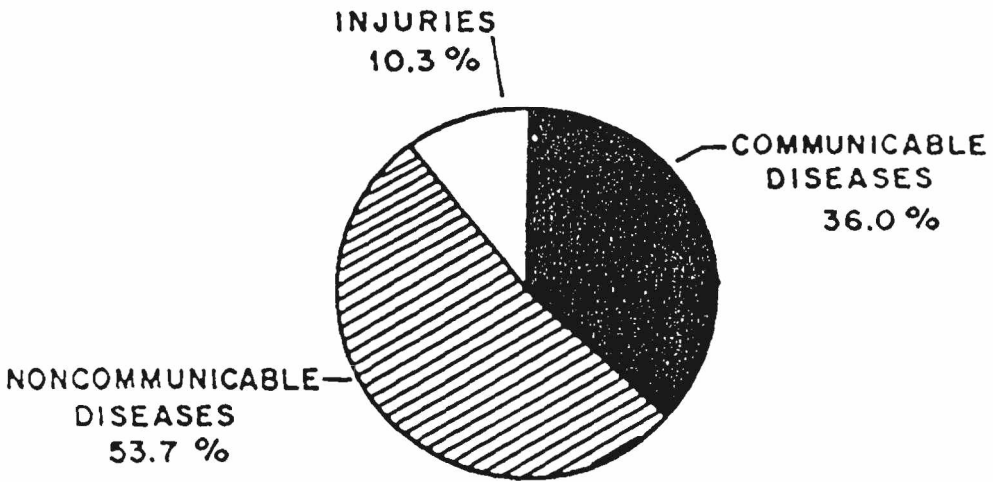
TABLE 8. age-adjusted* mortality rates per 100.000 population 15 years and over by malignant tumours. Chile 1969 and 1989 (Average Rates for three years, centered at shown Year)

SITES	1969	1989	% Change 1969-1989
Stomach cancer (151)	54.74	27.48	- 49.8
Gall Bladder cancer (156)	6.55	14.09	+ 115
Cancer of Respiratory Organs (161, 162)	13.37	15.99	- 19.6
Female Breast* cancer (174)	13.53	16.17	- 19.5
Cervix Uteri* cancer (180)	25.23	19.10	- 24.3
Prostate* cancer (185)	9.54	10.78	- 13.0

* Standard population: Chile 1982. Rates from Cancer of breast, cervix uteri and prostate, age-adjusted by sex specific population.

Source: I.N.E. Demographic Annual Reports 1968, 1969, 1970, 1988, 1989, 1990.

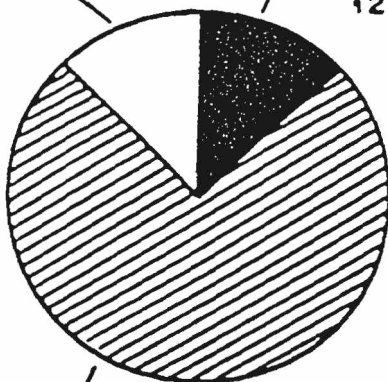
1970



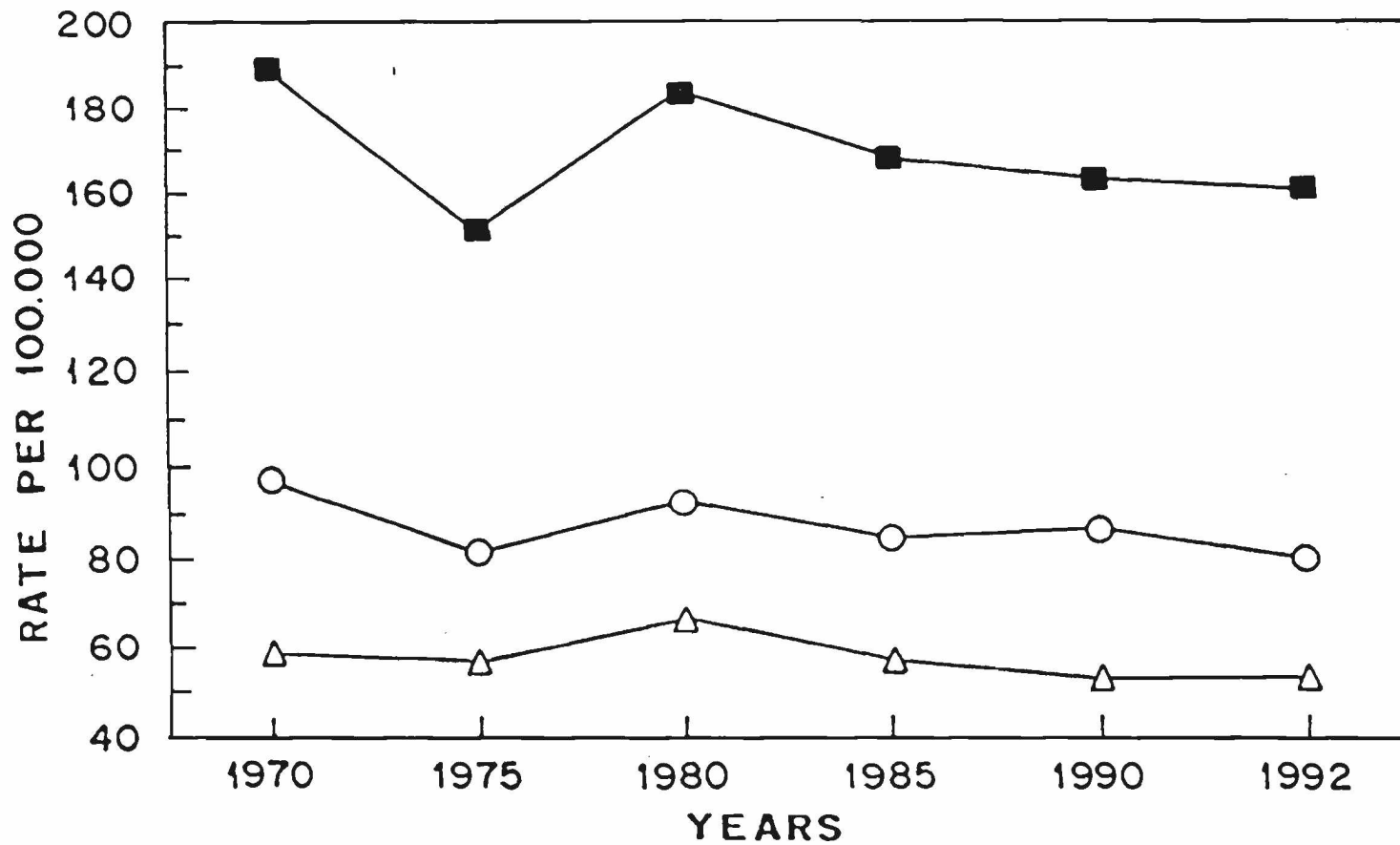
1990

INJURIES
12.2 %

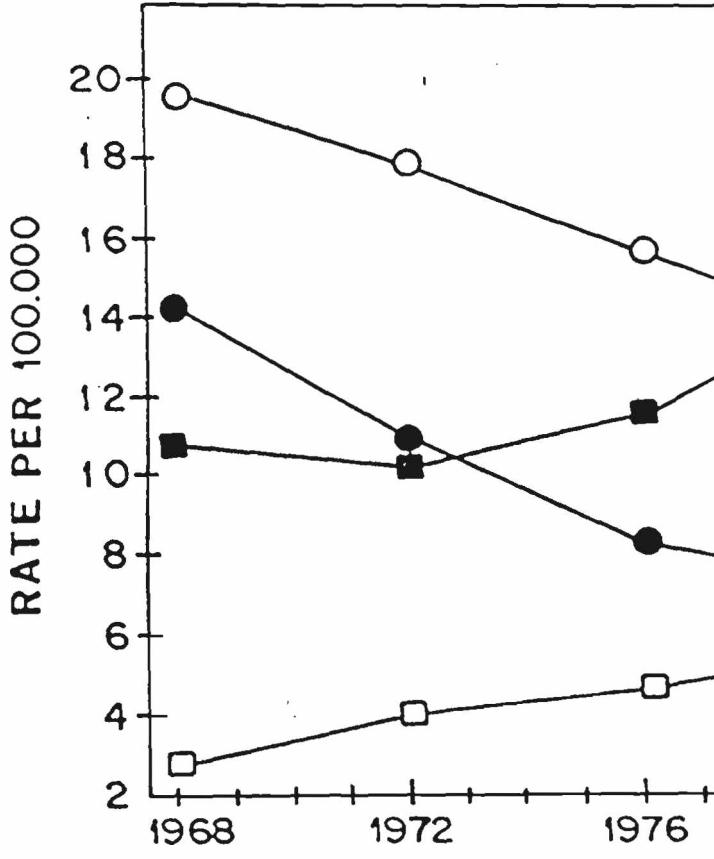
COMMUNICABLE
DISEASES
12.7 %



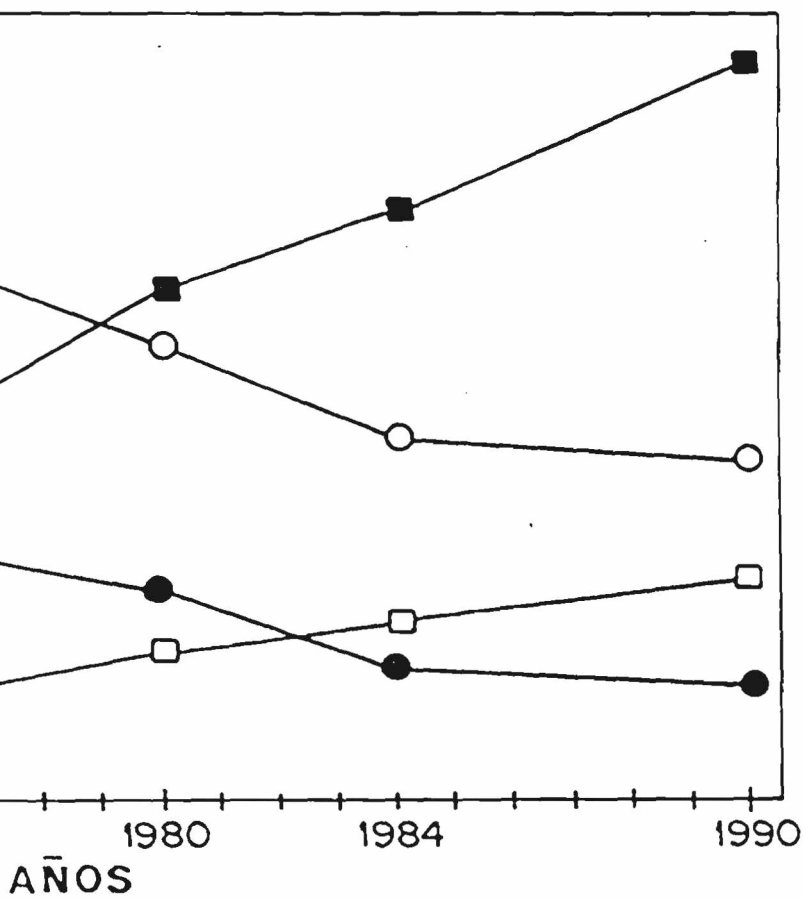
NONCOMMUNICABLE
DISEASES
75.1 %



- CARDIOVASCULAR DISEASES
- CORONARY HEART DISEASES
- △ CEREBROVASCULAR DISEASES

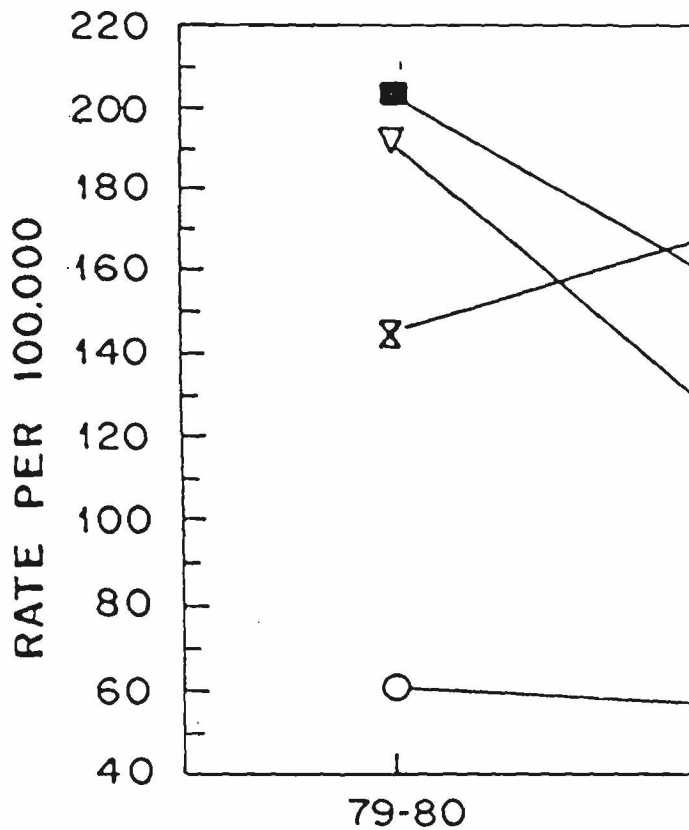


○ STOMACH MALES
● STOMACH FEMALES



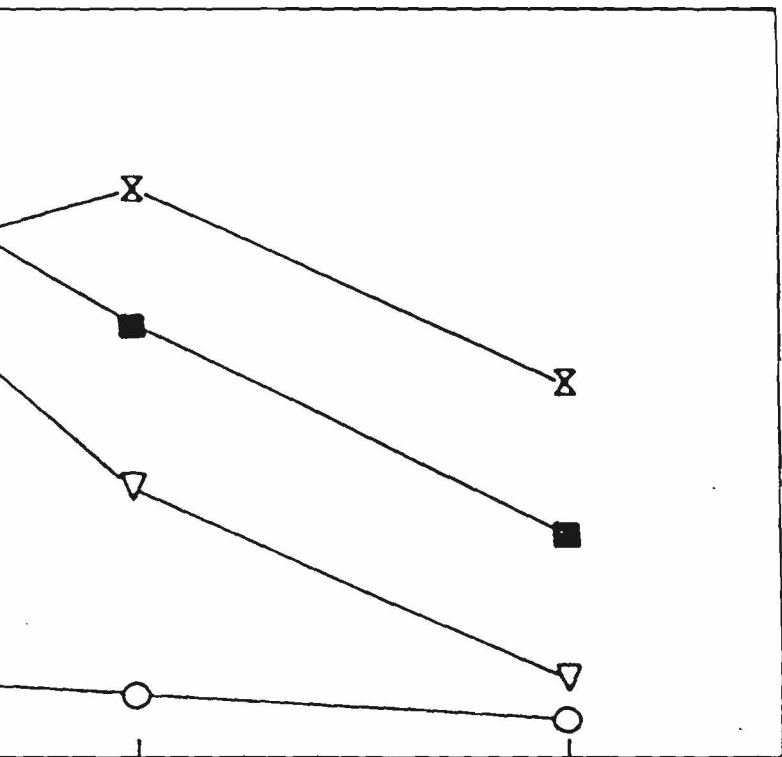
-□- GALLBLADDER MALES

-■- GALLBLADDER FEMALES



—○— TUBERCULOSIS

—X— HEPATITIS & TYPHOID



84-85
89-90
YEARS

■ GONORRHEA & SYPHILIS

▽ IMMUNOPREVENTABLES