Mortality Transition in Albania, 1950-1990

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ABSTRACT

Albania was noteworthy, not just for the isolationist policy of its government, or its domestic rigid policies applied to Europe's poorest country, but because of its high life expectancy at birth. At the end of the eighties, life expectancy at birth passed the boundary of seventy, although the country's GDP per capita was $2500 in 1990, the lowest in Europe (Madison 1995). This puzzled scholars, who either doubted the success of Albania, or because of the lack of firm information, speculated with different explanations (Watson, 1995).

This research was initiated by this controversy in trying to first, estimate the scale of Albania's success in improving life expectancy and document the mortality transition in Albania during the period 1950-1990. It also looks at the social, economic and political factors behind the success of improving life expectancy at birth from 51 to 71 years in a relatively short period of 40 years. The research attempts to explain why the Albanian pattern of mortality, with very high infant and child mortality and very low adult mortality, is so different from that of other East European countries, which had the same social and economic backgrounds. The analysis concludes that the life style factors are the most likely factors in explaining the controversial mortality pattern of Albania.

The research uses a new set of complete data, obtained from formerly-closed Albanian State Archives, which were made available only after 1994. It is the first time that the cause specific data are used to analyse the mortality transition in Albania.

The research starts with a description of country's cultural and historical background. It continues with the political, social and economic transition during the communist rule 1945-1990, which are of particular importance in understanding the demographic regime in general, and the mortality transition in particular (Caldwell, 1986). The research continues with a detailed analysis of the availability and quality of mortality data.

The analysis of mortality trends and patterns during this period confirms the success of Albania in achieving high life expectancy at birth by the end of eighties. It also shows that this was achieved by very low adult mortality, and relatively high infant and child mortality. The later analysis shows that this finding is related to the cause specific pattern of mortality, as well as regional differences within the country.

The research ends with an international comparison of mortality trends and patterns in Albania, in the context of whether the Albanian success was part of the experience of countries that had "a good health at low cost" (Caldwell, 1986), or if the Albanian way is another route to low mortality.

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Introduction

Albania is a unique country. For centuries it has been a closed book to other Europeans, a by-word for backwardness and inaccessibility. As a result, less is known about its medical and demographic history than for any other European country. This thesis goes some way to filling this void and, in doing so, uncovers several important aspects of mortality levels and trends in Albania that have a significance far beyond its borders. One issue of considerable interest which the thesis is able to address is how Albania, which remained overwhelmingly poor and rural throughout the communist era, was able to reduce mortality to levels comparable with far richer countries. The detailed answer to this question provides many additional insights on the role of life-style, diet and primary health care in achieving "good health at low cost". It also provides, for the first time, comprehensive and precise estimates of mortality trends and a detailed consideration of their determinants. Thus the thesis moves discussion of the Albanian case beyond the realms of speculation and semi-informed guesswork that have characterized some of the literature hitherto.

The depth of ignorance concerning Albania in other countries can scarcely be exaggerated. Thus chapter one provides an overview of Albanian geography, history and culture. The regional and cultural patterns evident in this chapter will be seen in later sections to have parallels in the study of mortality.

One of the most singular aspects of Albania's recent history has been the role of communism. In common with much of the rest of Eastern Europe, communism came into power in Albania in the aftermath of World War Two. However, even by the standards of other communist countries, the regime of Enver Hoxha in Albania was distinctive in its relentless suppression of opposition and its total collectivization of economic life. It also became increasingly isolationist over time, effectively cutting off Albania from all outside contacts. However, even if its economic and foreign policies proved disastrous, the regime achieved a transformation of Albanian social life that had many implications for health and mortality of its population. The reduction of long-standing traditions of discrimination against women, and the provision of universal education and primary health-care were achievements which even the regime's enemies acknowledge. Chapter two examines the distinctly mixed impact of communism on Albania.

Chapter three considers the data that are available for a demographic and epidemiological study of Albania. Until 1990 almost all statistical information on Albania was deemed to be a state secret, and any attempt to acquire it tantamount to espionage. However, surprising amounts of demographic, economic, and social statistics were produced by the central government, but were not published. In addition to information published since the collapse of communism, this thesis

makes use of previously secret information, held in government archives in Albania. Assessment of the data quality carried out in chapter three reveals that, although they have certain defects, the data provide a surprisingly consistent and comprehensive basis for analysis.

Having established the usability of the available data, chapter four investigates trends in mortality since 1950, with age- and sex-specific patterns analysed more completely than in any previous study. The results document the fact that Albania achieved relatively low mortality (with a life expectancy above 70 years) by the 1980s. However, they also indicate that gains were not equal at all ages. Consideration of the relative gains in adult mortality on the one hand and infant and child mortality on the other throws light on the underlying determinants of health improvement.

Chapter five extends the analysis to cover causes of death. It is the first detailed study of this topic carried out. The differences in age- and sex-specific mortality shown in chapter four are reflected in the cause-specific changes analysed in this chapter. The results indicate a crucial role for life-style and diet in the determining of trends in cause-specific mortality.

Chapter six examines regional patterns of mortality in Albania and its immediate neighbours. Marked regional differences are found within the country that have remarkably close parallels in Greece and Yugoslavia. Thus Albania can be seen to stand at a significant cultural frontier between "Balkan" and "Mediterranean" patterns of diet, life-style and health.

Chapter seven considers Albania in a wider international perspective. It demonstrates that Albania can be regarded as one example of how to achieve "good health at low cost", comparable with other success stories of this type, such as Costa Rica, China and Sri Lanka. However, it also shows that adult mortality is even lower in Albania than in those countries and is little worse than in neighbouring Mediterranean countries, such as Greece and Italy. In contrast, Albania is seen to have little in common with most other communist countries in Eastern Europe.

Chapter eight offers a brief conclusion to the thesis and considers the scope for further research into the issues it raises.

Chapter 1. ALBANIA AND THE ALBANIANS

1.1 GEOGRAPHY OF THE COUNTRY AND THE REGION.

Albania is not easily classified. Thinking of Albania as a region and a country, one can classify it in different ways. On one hand one can say that Albania is a Mediterranean country. But on the other, one can also say that is a Balkan country. A third dimension is to think of Albania as a country located in the Former Communist Block of Eastern Europe.

This geographical position of Albania in a way or another has played an important role in the past and the present history of the country. First Albania was the dividing line between the Byzantine and Roman Empire. This is reflected in the religious geography of the country, where some of the Northern-Western parts of the country are Catholic, such as Shkodra (Skutari), Lezha (Lisus), Durres (Durracium) (Selenica 1928, p. CXLVI-VII). Those cities were under Roman domination, while the rest of the country were under Byzantine rule. During much of the Ottoman occupation, the situation remained similar, some of the North-Western parts remained under Venetian control, some independent, and some under the Ottoman Empire. Even during the last fifty years Albania was the dividing line between the Eastern Block and the West.

Whatever the role geography has played in the past and present of the country, Albania is unquestionably a European Country, lying on the South Centre of Europe, and in the Western part of the Balkan Peninsula. It lies between 39°38' and 42°39' North, and between 19°16' and 21°40' East (INSTAT, 1992, p. 8). With an area of 28,748 square kilometres, extending of 340 km north-south and 150 km east-west, Albania is a small country (approximately the size of Wales). Albania borders on what remains of Yugoslavia (Montenegro and Serbia) in the North, Macedonia (FYROM) in the East, Greece in the South and South-East, and the Adriatic and Ionian Seas in the West and West-South of the country.

1.11 Land Formation

The country is predominantly mountainous, with 70% of its territory lying above 300 metres, and 30% above 1000 metres. There are two main topographic divisions of the country. The lowland zone is the costal area, while the mountains lie from the North-East of the country to the South-Central area (Hall, 1994, p. 17).

This mainly mountainous land formation has played an important role in the history, culture, civilisation and even in the language spoken in Albania. "The mountains are as a rule a world apart from civilisations, which are an urban and lowland achievement. Their history is to have none, to remain almost always on the fringe of the great waves of civilisation...To these hilltop worlds, out of touch with the towns, even Rome itself, in all its years of power, can have meant very little" (Braudel, 1972, p. 34). Those words used by F. Braudel to explain the penetration of religion and civilisation in the Mediterranean mountain areas, go very well with the history of Albania and Albanian population. It was this mountainous character of the country that saved the Albanians from assimilation by first the Romans, later the Slavs' invasion and lastly from the long night of the Ottoman occupation. "The North-East Albania, the region of the Albanian Alps, was not touched by Roman forces...It was there that the Illyrian (Albanian ancestors) way of life and the Illyrian language persisted..[1]" (Hammond, 1992, p. 39).

This divide between highlands and lowlands parts of the country, will be reflected in the geographical and regional differences in the demographic behaviour, especially mortality pattern - as we will see later, in Chapter 6.

1.12 Climate

Albania has a greater number of climatic regions than one would expect within so small an area. The main reason for this climate variation is the country's topography. The dividing line between the lowland and the highland formations is also the dividing line between a typically Mediterranean climate and the continental climate of the Balkan interior. The zone of the Mediterranean climate is limited to the coastal lowlands, where rainy and mild winters are followed by arid, hot, and almost cloudless summers. Average temperatures in this area in winter go from 5° to 10°C and in summer from 20° to 29°C (INSTAT, 1992, p. 16-7)[2]. The continental climate can be found in the mountainous interior of Albania, where temperatures in winter vary from -2° to 7°C, while in summer from 15° to 20°C.

It is possible to distinguish three types of summer climates in Albania: the northern mountains, the southern mountains and the costal lowlands. In winter the number of the climate zones is reduced to two. Strong Balkan winds collide with humid, warm air masses from the Mediterranean directly

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[1]Today's Albanian language is believed to be a continuation of Illyrian language.

[2]The temperatures used here are monthly averages

over Albania, so that heavy and frequent thunderstorms blanket the country. The continental cold air mass loses much of its force before it reaches the coastal plain. The average temperature remain rather high throughout the winter - the climate is still Mediterranean. In the mountains, on the other hand, one encounters cold waves of increasing severity as one proceeds eastward. All the uplands therefore have a continental climate during the winter (Skendi, 1956, p. 37-8).

This diverse climate of the country will also be reflected at the diverse mortality and morbidity patterns of the country, which will be analysed in detail in the later chapters.

1.13 Water Resources

The mountainous topography of Albania, as well as the continental climate, create a large number of rivers in the country. The dominant flow is westwards from the mountainous core over a relatively short distance to the sea. All the rivers reach the sea within Albanian territory. Five of the smaller basins discharge their waters into the Ionian Sea, while sixteen of the major watersheds empty into the Adriatic Sea.

A distinctive feature of the Albanian rivers is the considerable elevation at which they flow prior to reaching the costal plain. For this reason most of the streams, including the largest rivers, reach the lowland zone as mountain torrents. So, Albanian rivers have a hydro-electric power (HEP) potential, estimated at 2500 MW, which is second only to Norway within Europe (Hall, 1994, p. 21). However, the stream flow of Albania's rivers is highly irregular, with fluctuations which mirror the alternating periods of rain and drought. This irregularity of the streams is also reflected in the lowlands, where flooding has been a chronic occurrence.

Albania's internal waters encompass an area of 64,000 hectares. The country possesses over 150 lakes, which are of four types: (I) tectonic origin (the main lakes), such as Shkoder (370 km^2 within Albanian territory; this lake borders Montenegro), Ohrid (367 km^2; bordering Macedonia), and Prespa (285 km^2; bordering Macedonia and Greece); (ii) clastic origin; (iii) glacial, such as those of Lure in the North; and (iv) artificial, usually resulting from HEP constructions, like those over the Drin river.

The quality of water and the level of pollution, vary a lot, because of the wide period of study and also because of the different origins of the waters. Before industrialisation, Albanian rivers were characterised as unpolluted waters, and with a high content of solid particles, mostly due to the

erosion processes. With growing industry, during the communist period, amounts of industrial waste were visibly polluting some of the country's rivers. Some of those rivers today are very polluted, as for example the Seman (one of the largest rivers). In addition to receiving ammonia, arsenic and nitrates from a fertiliser plant, it receives every day 14 barrels of petroleum from poorly maintained oil wells (Cullaj, 1992). In upland areas mining activity has heavily polluted some rivers, such as the Shkumbin, which runs red downstream from the ferro-nickel mines, and the Mat contaminated with wastewater from copper and chrome mines.

The Albanian lakes are not as polluted as the rivers, and some of them are of international importance, because of their rich fauna (for example Ohrid, which is a UNESCO-recognised 'natural monument'). There is a growing concern about the danger of pollution, because four of the country's largest natural lakes are shared with neighbouring countries.

Drinking water has been and still remains a major problem in Albania, in terms of quantity of supply and its quality. By the early 1980s only 56% of the country's villages were supplied with drinking water. Today water quantity remains insufficient in most urban areas, where running water is sometimes limited (Shkodra; Ganiu, 1984, p. 36 and Hall, 1994, p. 152). Because of poor domestic and industrial plumbing and maintenance of water systems, bacteria and other harmful additions enter the domestic water supply, causing a high level of pollution of drinking water. The poor quality of water and the existence of swamps, even after World War II, have played a major part in the spread of epidemics, especially malaria, as we will see it later, in Chapter 5.

1.2 POPULATION BEFORE THE ACHIEVEMENT OF INDEPENDENCE IN 1912

1.21. Illyrians and their origin.

It is not by chance that most of the publications on Albania and Albanians start with Edward Gibbon's description in 18th century of Albania as a country "within the sight of Italy which is less known than the interior of America" (Konica, 1957, p. 12; Logoreci, 1977, p. 1; Prifti, 1978, p. 1; Winnifrith, 1992, p. 1). Of course this description refers to Italy and America 200 years ago when the author wrote it, but it contains some of the truth on outside knowledge on Albania, until late 1990 when communism collapsed and the country was opened. The supporting evidence for this claim is the fact that one could easily count the publications on Albania till late after the World War II. It is, however, only part of the truth, because today it is not scientific knowledge of the history,

civilisation and culture of the country that is lacking, but rather the number of publications about them.

As Winnifrith states, it is difficult to write about the history of a race which has spent so much time under foreign domination and whose records as well as being difficult to find, are usually to be found in the language of these foreign invaders (Winnifrith, 1992, p. 2). That is why in this study the main quotes come from recent authors on Albania and the Albanians.

The Albanians are considered as descendants of ancient Illyrian tribes, who belonged to a group of Indo-European tribes who came from the north to settle in the Balkan Peninsula towards the end of the second millennium BC at the latest (Harding, 1992, p. 17), thus, long before the Greeks. Other groups of scholars explain the origin of the Illyrians and Albanians from Pelasgi, whom some ancient writers quote as being the very ancient inhabitants of the Southern Balkans. No serious evidence is found to prove this theory. Whatever theory is true about the origin of the Illyrians one thing is now established that the Illyrians were an indigenous population in the Balkans by at least the second millennium BC.

The Illyrians as one of the most numerous populations of ancient Europe, occupied the western part of the Balkan Peninsula. The territories that they inhabited were bounded on the North by the Sava and the Danube, on the South by the Gulf of Ambracia and the Northern areas of Greece; on the East by the Morava and the Vardar which separated them from Thrace, on the west by the Adriatic and Ionian seas (Pollo and Puto, 1981, p. 4).

1.211. Language

These populations, whom the Greeks and the Romans referred to as Illyrians, spoke a different language from either Greek or Latin. The Greeks had a word for the speaking of Illyrian (illurizein) and recognized a language different from that of Macedonians and Thracians, as well as Greek (Wilkes, 1992, p. 69). What we find today is the Albanian language, a language with an Indo-European root, and different Illyrian names and places. Most of the studies on the relations of the modern Albanian and old Illyrian language have proven that the spoken Albanian today is a derivative of one of the Illyrian dialects spoken by the Illyrians living in the mountainous region of North-East Albania.

The distinctive language of the Albanians has become very important during the centuries.

Especially in the flowering of the European nationalism, language was the most frequent invoked attribute in support of national ideas and identity. In the case of Albania, religion was not a unifying factor on which the nation and national movements were based, as in other Balkan countries.

1.212. Religion

The Illyrian populations, like most of the prehistoric populations, before Christianity was introduced, believed in different objects of cult. For most of the Illyrian tribes, as with other people at this stage of development, sun-worship was the basis of all their religious manifestations.

Illyrians were among the first populations to accept Christianity. It was first introduced in the first century of its era. When the division of the Roman Empire into East and West occurred (AD. 395), Albania (Illyria) constituted administratively part of the Eastern Empire, but ecclesiastically was dependant on Rome (Skendi, 1957, p. 3). Later in AD. 732, Albania was detached from Rome and subordinated to the Patriarchate of Constantinople. The situation changed in the following centuries, when the two churches were drifting apart, but in general Albania tended to follow Constantinople. When the final schism took place in 1054, the northern part of the country had come under the Roman Catholic Church, and the South under the Orthodox one. Since that time this religious division has been present in Albania even when the Turks occupied the country and Islamized part of the population. We find this religious division even in the today Albania. But, this again proved that the religious differences had little lasting importance in contrast with Albanian national unity (Hall, 1994, p. 42). They also had a lasting effect in later regional differences, which on a large scale in the past, and still at the present time, determine demographic behaviour.

1.22. Illyria and its relations to Greece and Rome

Being between two of the dominant civilisations of the Mediterranean world, the Greek and the Roman, Illyrian tribes reached a high degree of cultural development. The first Greek colonies on Illyrian land, along the Adriatic coast, were created in the 7th century BC. The most important ones were Epidamnos or Dyrrachium (today's Durres) and Apollonia, between Durres and Vlora.

With a population of 40,000 - 50,000 each (Pollo and Puto, 1981, p. 7), those two city-states underwent brilliant growth. They became centres of trade between the native Illyrians in the hinterland and the other Greek centres. They also became centres of a refined culture.

These two Greek colonies, which were like scattered islands of Greek culture in the middle of an ethnically Illyrian sea, had a great influence in the future history and culture of the region.

After a century of constant war between the Romans and Illyrians, along the Adriatic coast, the Roman Empire annexed Illyria and made it one of its provinces. The Illyrians were brought under Roman rule in 167 BC (Hall, 1994, p. 5). Unlike the Greeks, the Romans spread colonies throughout today's Albania and other Illyrian lands in the Dalmatian seacoast. Like the Greek colonisation, the Roman rule brought civilisation and culture. But, this civilisation came also with a high degree of assimilation of the Illyrian populations and their culture. The only areas that the Romans could not penetrate were the mountainous regions of the Albanian Alps, where the Illyrian language and lifestyle persisted.

Long before the Greek and Roman influences, the first organisation of the Illyrians in their own state occurred in the 5th century BC. By the middle of the 4th century BC there were two Illyrian states: the *Kingdom of the Illyrians*, including the south-east regions of Albania, and the *Koinon of the Molossians* (Epirus). The Kingdom of Illyria had existed for a long time, till 168 BC, when the Romans brought down the resistance of the Illyrians and the Epirotes. The history of this kingdom tells us of a high level of organisation as a federative state, especially during the rule of Bardhylis (4th century BC) and the rule of Agron and Teuta (3rd century BC).

1.23. From Illyrians to the present day Albanians.

(Barbarian and Slav invasions).

In the sixth century AD the country of Illyria was entirely under the Eastern Empire. The country was heavily populated - with three million people living in the provinces of Illyria, out of seven million, who were to be found throughout the Balkan peninsula (Pollo and Puto, 1981, p. 24).

The year 529 AD marked the beginning of the barbarian invasions in Illyria with first the Huns, and ending with the Slavs. It was only the Slavs, starting at the end of sixth century AD, who settled in the Balkan Peninsula. The Illyrians and Romans were pressed back to the coastal areas of Dalmatia and present day Albania. The population of those provinces suffered the loss of many lives. The Illyrian population was reduced to a few hundred thousand people.

In the eleventh century for the first time the name of Albania appears (in the forms of Arbanon-

Arberia, Albanoi-Albanians). This name was used to describe the population living in the centre of the present day Albania, which eight centuries ago, was inhabited by the Illyrian tribe of Albanoi.

After the barbarian invasions and the Slav migration, the northern Illyrians disappeared from the historic scene. The southern Illyrians, who populated the New Epirus, the north of the Old Epirus, all of Dardania, and the south of Prevalitania, resisted all the attacks. But, during the course of the centuries, this old population was to lose its ancient name of Illyrian and to enter medieval times under the name of Albanian.

1.24. The long night of Ottoman Empire - Resistence and Occupation.

The later part of the 14th century saw the eruption of yet another formidable power in the Southern Europe - the Ottomans - one that was destined to have a profound effect on the historical developments of all the Balkan people, and in particular on the Albanians. The Ottoman occupation of Albania in 1385, found Albania divided into small territories ruled by independent semifeudal lords. At the end of the 14th century the Albanians were inhabiting a quadrangle area from Tivar (Bar)-Prizren in the North, Prizren-Ohrid-Ionina in the Eastern part, and Ionina-Butrinti in the South (Frasheri, 1985, p. 218, 221). The population was all Christian, with Catholics mainly in the North and Orthodox in the South and Centre. This religious geography was a reflection of the dominance of the Byzantium and Rome over the local feudal lords of Albania.

Albania's long night of Ottoman rule was lightened by the single flash of independence under Gjergj (George) Kastrioti or the Scanderbeg (1442-1468). He managed to stop Turkish progress in Europe for a period of 25 years, which was one of the most powerful periods of the Ottoman Empire. This is reflected at the fact that Scanderbeg was titled by the Pope Nicholas V, as the "Champion of Christendom". The death of Scanderbeg, did not break Albanian resistance, but gradually the Turks extended their territorial conquests in Albania and the year 1501 marks the beginning of a long period with lasting consequences of the Ottoman Conquest.

There are two main events in this long period. First, with the arrival of the Turks, Islam was introduced in Albania as a third religion. Secondly, this conversion caused a massive emigration of Albanians towards the Christian European countries. The conversion of people to Islam was a slow and uneven process. In the 16th century, most of Albania remained Christian. If we refer to the figures of the early Ottoman censuses (Winnifrith, 1992, p. 77), they show that in 1510 Christians in Vlore, exceeded the Moslems by thirteen to one, and in Gjirokaster, there were 53

Moslem families and 12,257 Christian ones. The major conversion happened during the 17th century. This came because, as the economic-political basis of the Ottoman Empire was not nationality, but religion, the converted Moslems seem to have had some privileges, notably avoiding taxes. This conversion had large consequences for the country, not because the conversion itself, but because many of the country's most gifted and ambitious men emigrated to Turkey, in search of careers. Some of them achieved high positions of power in different parts of the Empire. Their departure created a serious political and cultural vacuum in the country itself.

The other important event during this period was the large scale emigration. This emigration happened first among Christian Albanians, who did not convert to Islam. Tens of thousands of them emigrated to the South of Italy, where they settled as a community and still, to a certain degree, retain their Albanian tradition and language. The other emigration happened among the Moslems, who gradually were settled in Turkey or other parts of the Ottoman empire.

In addition to being divided by religion, the Albanians were divided into two main linguistic groups, the Ghegs and the Tosks, north and south of the Shkumbini river. The difference between the two was about the same as the difference in language between Lowland Scots and English, but cultural differences were also involved, with the Ghegs remaining in a tribal structure akin to that of the Scottish Highlands, while among the Tosks this structure had decayed, and there was more urbanisation.

1.3. INDEPENDENCE OF ALBANIA - THE CREATION AND THE CONSOLIDATION OF THE ALBANIAN STATE.

Albanians were among the last nations to become independent from the Turkish Empire. This has been attributed to a number of different explanations; the lack of unity among the Albanians, the Islamisation of part of the population, the privileged conditions of Albanians in the Empire, as well as to the lack of support for Albanian independence from the Western powers or Russia.

The independence of Albania did not come quickly; it went through a lot of difficulties for nearly a century, until 28 November 1912, when the country was proclaimed independent, and approved by the Great Powers at the London Conference of 1913.

One major internal event that helped towards independence was the creation of the League of Prizren, in 1878, which organised the movement within the country. Also important, as outside

events, were the Treaty of San Stefano (1878), which separated Albania from the neighbouring countries of Greece, Serbia, Bulgaria and Montenegro, the Berlin Congress (1878), which sanctioned this separation, and the London Conference (1913), where with the help of Austria and Italy, Albanian independence was recognised in approximately the present day borders.

The mixed outcome of this century long movement for independence, however, was not just the achievement of an independent Albania, but also the loss of nearly half of the territories inhabited by ethnic Albanians, creating a drama with lasting consequences (even to the present day) for the Albanian populations living in those territories. Thus, out of the Albanian infant state Kosova was given to Serbia, Ulqin and Tivar were given to Montenegro, the Eastern part of Albania was given to Serbia (today's Macedonian territory), and the South-eastern part of Albania (Çameria) was given to Greece. That is why today, there are about as many Albanians living in these neighbouring countries as within Albania. We will refer later to these populations.

After the independence of Albania in 1912 until the consolidation of the Albanian state (with King Zog's coming into power in 1924), the country went through an unstable period, politically, economically, and also in terms of national identity. It is important to mention here the Lushnje Congress in 1920, which gathered the Albanian leaders together, and made the Albanian problem international. As a result of pressure from the Lushnje Congress, in the same year Albania was admitted to the League of Nations.

1.4. PRE-WAR ALBANIA (The state of the country before World War II)

Until 1924, when Zog came into power, the political situation of Albania was considered unstable. Zog came into power first as prime minister, later as president, and then proclaiming himself King of Albania. From 1924 until 1939 (the occupation of Albania by the Italians), Albania went through the consolidation of the state, and also tried to reform the economy. Politically King Zog was very orientated towards the Western powers, and had their support to maintain his reign and to apply different economic reforms, in order to improve the country's feudal and very poor economy. The most influential country of all was Italy.

The state of the Albanian economy when Zog came in power was extremely poor. Farming was the main economic activity, occupying more than 80% of the population. The state of agriculture was shocking, and the methods used were primitive. Albania had no large industrial establishments.

There were primitive cottage industries supplementary to agriculture or stock-raising, and catering undertaken mainly for the needs of the household.

The recovery of the world economy after the World War I, stimulated an increasing demand for the country'sminerals, and other natural resources. Thus, more West European and American economic interests entered the country. Because of their political influence with King Zog, and because of the geographical position, it was the Italians who increasingly benefited from the country's oil and other natural resource wealth. With the increasing Italian presence in the Albanian economy, a number of reforms were undertaken to create and improve different sectors of the economy. Apart from Italian companies investing in country's economy, the Albanian economy also benefited from a large number of loans given by the Italian Government. From 1925 to 1939, Italian loans, largely for the improvement of Albania's infrastructure, amounted to 130 million gold francs (Hall, 1994, p. 104). 275 km roads were constructed from these loans, the three main ports were reconstructed, and some light industry developed.

So, at the beginning of World War II, the Albanian economy consisted of a largely primitive agriculture, which was not able to supply its own population, a very poor light industry orientated to the processing of farming products, with an antiquated mineral extracting industry, and a poorly developed international trade. In 1936 this was equal to 3% of the British trade, 12% of that of Greece, and 44% of that of the Yugoslavia. A low level of urbanisation existed, and only a minimum of infrastructure facilities that were needed to permit foreign economic exploitation.

The level of education was also very low, although some progress had been made between 1920-1939. Primary schooling became compulsory in theory (but in practice it was widely neglected) and nearly 650 primary schools were opened by 1938. By the beginning of World War II, no more than 20 secondary schools of various types, with an enrolment of 5,700 pupils, had been set up. This development was still very inadequate. Figures for 1927 (Selenica, 1928, p. CLVI) show that 92.4% of the population were illiterate. Among the literate population only 446 had a university degree, and 1773 had secondary schooling.

High birth and death rates - as a result of both, high infant mortality and adult mortality among males from the blood feuds in the North - characterised Albania's pre-war demographic situation.

The earliest census of the population was carried out in 1923, with a population of 814,380, of which Muslims comprised 67.7%, Christian Orthodox 21.7% and Catholics 10.7% of the population

(Selenica, 1928, p. CVI). A later census of 1930 shows a figure of 1,003,097 for the Albanian population. From 1923 to 1945 (the first census after the war) the Albanian population increased at an annual growth rate of 1.4%. The country's natural increase from 1930-1938 (5.6%), was lower than that of Bulgaria (13.8%) and Rumania (14.0%) (Mason et al., 1945, p. 129). This was due to a very high death rate in country during the pre-war period. According to the League of Nations in 1941, the crude death rate for Albania in 1938 was 17.7 per thousand. In a later study a figure on life expectancy at birth is given for 1938 as 38 years (Misja, Vejsiu and Berxholli, 1987, p. 114). Even these figures are thought not to be accurate, because death registration was not complete. There was no death certificate form, the posting of registers was always in arrears, and very little information on cause of death was recorded. The majority of villagers died without any medical intervention. In the early twenties over half of the country's 2,540 villages had never been visited by a doctor (Haigh, 1925). The high death rates were accompanied by a high birth rate - in 1938 the crude birth rate was given as 34.4 per thousand. This figure is believed to be a substantial under-statement, because registration of birth was very incomplete, as a result of a high tax that was introduced by the government for the registration of the birth (half a gold franc). More than half of the births were believed not to be registered in the North of Albania.

The situation in public health was even worse. Until 1922, when the first public health service was established, there was no health institution in the country. As a consequence, an almost complete lack of published information regarding health conditions and disease prevalence in Albania existed. Medieval conditions under Turkish rule left the country subject to all the common diseases, but with no machinery to fight them. The country had an entirely justified reputation for being unhealthy and very malarious.

The first data to be produced on the health conditions and the prevalence of disease with reference to malaria, were produced by Dr W.E. Haigh in 1925, after a survey carried out by him in 1923 in some of the main cities of the country. From his report (Haigh, 1925), for the first time it was documented that epidemics were widespread in Albania, especially of malaria. Haigh reported that the population was living at a very low economic level. Undernourishment was everywhere apparent. The average family income was insufficient to produce an adequate diet for the children.

However, although the situation with regard to malaria was appalling, Haigh's work did include

some good news. Smallpox, typhus fever[3], and relapsing fever were not endemic. Dysentery was rare. Mild outbreaks of scarlet fever, whooping-cough, and measles were of annual occurrence. Diphtheria was rare. Tuberculoses, however, was very common. So was syphilis in the rural areas. And, most of all, nearly everywhere there was malaria. Later figures, referring to 1932-1938 (Hackett, 1944, p. 121-33), from a survey carried out in seven Albanian cities, show that from 28,228 examined children, those with malaria parasite in the blood and with an enlarged spleen, were as follows: in Tirana 27%, in Durres 29%, in Shkoder 32%, in Berat 53%, in Kavaje 54%, in Elbasan 54%, and in Vlora 58%. The figures show that in Vlora, Elbasan, Kavaje and Berat, malaria was hyper-endemic, while in Shkodra, Durresi, and Tirana, it was severely endemic.

1.5. ALBANIANS IN THE BALKANS AFTER THE WORLD WAR II TO THE PRESENT DAY (Demographic aspects)

Albanians in the Balkans inhabit the territory of Albania, part of Serbian territory (the province of Kosova), the Western part of Macedonia, as well as some neighbouring areas with Montenegro and Greece. There are groups of ethnic Albanians living all along the Albanian border with Montenegro, Serbia, Macedonia and Greece. The most concentrated area inhabited by Albanians, apart from Albania itself, is Kosova with a population of 1,954,747 (S.Y.Y., 1992, p. 52) in 1991, where 82.3% or 1,607,690 are Albanians. Another 427,000 Albanians live in Macedonia, as well as 40,880 in Montenegro.

As outlined above, this geography of the Albanian population is related to the collapse of the Ottoman Empire at the end of 19th century, and the independence of Albania. The Congress of Berlin in 1878, decreed that certain Albanian-populated areas of the region be given to the slavic states, as well as to Greece. Later at the London Conference of 1913, this division was completed. Thus, North-East, and North-West Albania (Kosova and the Albanian territory of Montenegro and Macedonia) remained under Yugoslavia, while part of South-East Albania remained under Greece. The lands lost to Yugoslavia on these occasions amount to well over half the territory of the present Albania.

Different sources give different figures on the number of the Albanians living in these areas at that time. One Italian estimate referring to 1939 gives the figure of 915,000 Albanians living outside

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[3]While typhus fever was diagnosed, typhoid fever was occurring although it was not always diagnosed (Mason et al., 1945, p. 120).

Albania: 700,000 in Yugoslavia, and 215,000 in Greece (Mason et al., 1945, p. 131). This figure is similar to the Albanians living in Albania at that time (census of 1930 in Albania- 1,003,097). Apart from the Balkan areas inhabited by Albanians, there are two other concentrations of Albanians in Europe; one is in South Italy and Sicily, where in 1951 101,878 ethnic Albanians were living in 36 villages (I.C.S., 1958, p. 47-50) (this concentration is a result of the emigrations of Albanians in the 15th, 16th, and 17th century), and the other in Turkey.

The Albanian concentration in Turkey was created by three large waves of emigration in different times. The first one was the deportation of Albanians from Kosova in 1910, when 120,000 Albanians were deported to Turkey by the Serbian authorities (Islami, 1990, p. 50-1). The second one was in the period between 1926-1938, where under agreements between Yugoslavia and Turkey, about 400,000 Albanians emigrated to Turkey (Prifti, 1978, p. 227), and the last one was after W.W.II, in the period 1953-1966, when nearly 400,000 Albanians were forced to emigrate to Turkey from Kosova (Bajrami, 1990, p. 17).

Today, when we talk about the Albanian populations in the Balkans, we refer to 3 million Albanians living in Albania and also over 2 million Albanians living in what remains of Yugoslavia and Macedonia. The Albanians in Greece and Italy are mostly assimilated. The number of Albanians living in Yugoslavia and Albania are given in Table 1.1.

Table 1.1. Number of Albanians in Yugoslavia and Albania 1943-1991 (in census years)

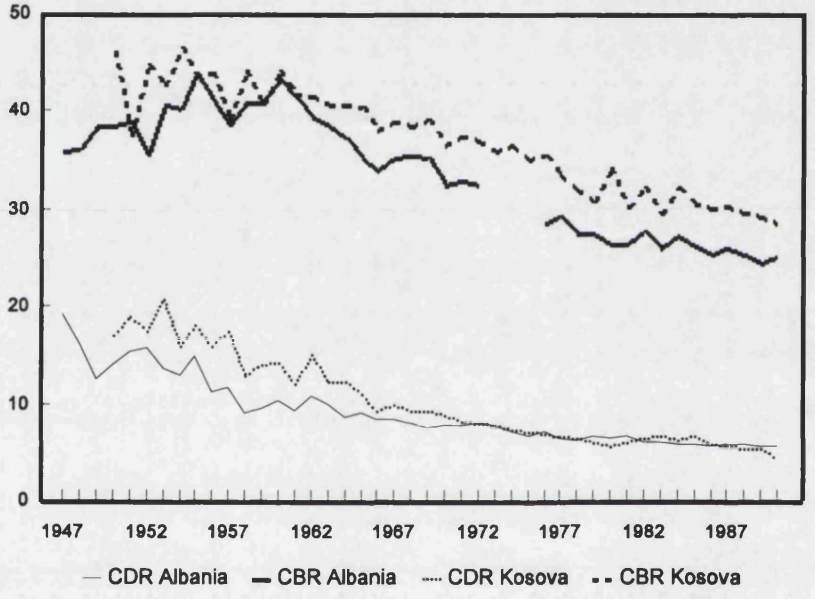
Countries	**1945**	**1950**	**1960**	**1969**	**1979**	**1989**
Albania	1,122,000	1,218,900	1,626,300	2,068,100	2,590,600	3,182,400
	1943	**1953**	**1961**	**1971**	**1981**	**1991**[4]
Yugoslavia	750,431	754,245	914,733	1,309,523	1,730,878	2,154,541
Kosova	498,242	524,559	646,605	916,167	1,226,736	1,607,690
Macedonia	197,389	162,524	183,108	279,871	377,726	427,000
Montenegro	19,424	23,460	25,803	35,734	37,735	40,880
Other Repub.	35,375	43,702	59,217	77,748	88,681	78,971

Source: Statistical Yearbook of Yugoslavia 1992; Demografiska Statistica 1960-1988; Statisticki Bilten 1972, 1982.

[4]The data on 1991 refer to what remained Yugoslavia (Serbia and Montenegro, including Kosova), and the data on Macedonia refer to the census in Former Yugoslav Republic of Macedonia.

The Albanian population has rapidly increased after World War II, on both sides of the border. The population of Albania has been increasing with an annual growth rate of 2.4%, while that in Yugoslavia at 2.2%. Both populations in Albania and in Yugoslavia have tripled in the last 50 years. Although the growth rate of both populations is slowing down, their level of fertility is still well above replacement level. In Albania the TFR in 1990 was 3.03 (INSTAT 1992, p. 59, while in Kosova in 1988 it was 3.96 (Demografiska Statistica, 1988). These levels of fertility in Albania and Kosova are by far the highest in Europe today.

Figure 1.1. Crude Rates for Albania and Kosova 1947-1990.



From Figure 1.1, where the crude rates are given for both the populations in Kosova and Albania, it is clear that the level of fertility is still very high in both the places; in 1990 CBRs were 28.7 for Kosova and 25.5 for Albania. After 1960, the level of fertility has constantly been higher in Kosova in comparison with Albania. However, the populations have been living in two different countries (with two different social and economic systems), it is significant that their changes in fertility are similar. The same can be said for mortality changes. The CDR was a little higher in Kosova from 1950 to 1972, but after 1972, the values of CDR are nearly identical. In 1990 CDR is 4.3 in Kosova and 5.0 in Albania. While the mortality transition looks as if it is close to completion for both populations, the fertility transition is still in its way. Mortality patterns in both Albania and Kosova will be analysed in details later in the other chapters.

Conclusion

This chapter has provided a historical and cultural overview of Albania and Albanians. This distinctive geography and history has some striking parallels in the mortality patterns analysed in

later chapters. Before getting on to demographic matters, however, we need to consider yet another distinctive chapter in Albania's history: the period of communist rule. This is the subject of the next chapter.

Chapter 2. COMMUNISM IN ALBANIA -Political, Economic and Social Implications

2.1 POLITICAL IMPLICATIONS

The history of Albania since World War II cannot be understood without a grasp of the impact of communist rule. This rule was established in Albania in 1944, at the end of the World War II, when the communist forces leading the Anti-Fascist coalition took control of the country. Communism in Albania lasted for more than 40 years until 1990, when the country participated in the political and economic changes sweeping all Eastern European countries.

When the communists under the leadership of Enver Hoxha took control in Albania they faced many problems, which of their nature were similar to those problems that had confronted the nation's founding fathers in 1912. The economy was in a shambles, and much of the progress that had been made in upgrading the infrastructure during the King Zog's regime had been negated by the actions of the anti-Axis guerrilla forces and the National Liberation Army, as well as by the retreating German army.

The new regime faced not only the need to reconstruct the country, but the necessity of building a modern economy, which did not exist and a whole new social system, in a predominantly agrarian society, where more than 80% of the population was living in extremely poor conditions in rural areas. The state of health of the population was extremely bad. Malaria was widespread in the country and was one of the major causes of mortality. In 1949 there were 238,266 malaria cases reported, which means that 20.1% of the population was infected (Skendi, 1956, p. 260). Also present were other epidemic diseases such as diphtheria. But most of all, tuberculosis was widespread, and in 1950 accounted for more than 15% of all deaths[1]. The education level of the population was in a similar state. More than 80%(1940) of the population were illiterate (Keefe et al., 1971, p. 83). There was a lack of professionals in all areas.

After focussing its initial efforts on undoing the damage the country suffered from the World War II, the new regime formulated its strategy for long term development, which was designed to transform Albania from a backward agrarian country into a modern industrial state. In pursuing this

[1]This figure was calculated based on the data from the Albanian State Archive

goal the Albanian leaders eagerly embraced the Stalinist system of centralized economic planning and management, which they believed was best-suited, given the conditions they had inherited, to build socialism and achieve modernisation. Under circumstances of widespread misery and poverty, a centralised system can offer a very effective mechanism for mobilising resources for growth and organising their allocation.

In the early fifties the communist state was established and consolidated. A specific version of the Soviet model was applied with two main characteristics. First, in terms of political life, a one party system was created, where the communist party had complete control of the state. Secondly, a highly centralised type of economy was introduced.

Until the mid-seventies the Albanian system was similar to that of other Eastern European Countries. The main difference during those years can be attributed to the fact that instead of decentralising the system, as started to happen in some other communist countries, the Albanian system was increasingly centralised.

In 1976 with the adoption of the new Constitution by the Albanian People's Assembly, a new policy was introduced in Albanian political and economic life - Albania sanctioned its "self-isolation". Any foreign credit was abolished, the government was prohibited from granting concessions to "capitalist and revisionist monopolies and states", and from forming joint economic or financial enterprises with foreign companies or countries. From then on, Albania was going to "construct socialism based on the principle of self-reliance"[2]. This policy of self isolation had a long lasting effect for the country, and it marked the beginning of the decline in the Albanian economy, which until 1976, had been supplied by the aids and credits, first from the Soviet Union and after 1954 from China.

2.1 Reforms after World War II.

The Albanian Government followed a policy not unlike that of the other socialist countries, in order to accomplish its development strategy, with emphasis on the development of an industrial base to bring about basic structural changes and a general neglect of agriculture. It was only due to the Chinese influence in the sixties that the emphasis toward agriculture changed. To initiate its policy was not an easy task, considering the low per capita income of the population ($83 in 1950 and still

[2]Citation from "The constitution of the Socialist Republic of Albania",1976, Article 14.

only $151 in 1960 and $173 in 1965) (Hoffman, 1972, p. 99) and the general underdevelopment of the country at the end of World War II.

To accomplish its strategic goal - the transformation of Albania from a backward agrarian country into a developed industrial-agrarian one, the Albanian Government started the immediate nationalisation of the existing production units. This task could easily be implemented in industry, but was very difficult in agriculture. Nationalisation of the land in the conditions of an 80% rural population was politically inexpedient for the Albanian communist leaders after World War II. It was this rural population that strongly supported the communists during and after the War, and its seizure of power, and this population was strongly attached to the land (KPSH, 1974, p. 32).

For this reason the Government adopted a gradualist approach to the transformation of the agricultural economy. The first step in this process was the beginning of the Agrarian Land Reform, which was sanctioned by Law in August 1945, based on the principle that "the land belongs to the tiller". So, based on this Law, the Albanian Government confiscated the large landed estates without making any compensation to the owners. The land was then re-distributed to the peasants, with the condition that it could not be sold, bought, or rented.

By applying this land reform, the Albanian Government not only satisfied the major part of the population of the country, but at the same time they changed the social structure of the population. It has to be mentioned that in 1945, 4% of the land was owned by 7 "great" families, 23% by rich families (3% of all families), 13% by the Government, and the rest by the remaining 83% of Albanian families in rural areas (Sjoberg, 1991, p. 33). This reform, which was completed in May 1946, had not only political and economic consequences, but it also brought some changes to the population structure and movements, which will be dealt with later in this chapter.

With the agrarian reform still to be fully implemented, starting in September 1946, the Albanian Government started the Collectivisation of Agriculture. This process of collectivisation of farms into joint cooperatives, which was first inspired by the experiences of the Soviet kholkozes, was not a rapid process like the Land Reform. On the contrary it was a prolonged process, which only slowly gained momentum. It continued for 20 years, until 1967, when collectivisation was considered completed.

The collectivisation process was carried out in various stages. At first each village constituted a

single cooperative farm; then several villages were joined into a larger unit; finally these units were joined to the nearest and more prosperous collective farms of the lowlands, which provided them with credits, technical equipment, seeds and fertilizers.

The collectivisation of agriculture, was one sphere in which Chinese influence has had a marked effect in Albania. Inspired by the Chinese experience, in 1959 it was decided to unify small cooperatives into larger units, and later in 1967, it was decided to bring this land under public ownership (state ownership), thus making Albanian farming the most thoroughly collectivised in the whole of Eastern Europe. The reasons behind this were not economic, but rather political and ideological. The development of this policy is shown by figures for the number of collectivised farms. In 1950 there were only 90 cooperatives, in 1960 the number increased to 1,484, while by 1965 and 1970 it was respectively 868, and 643 cooperatives (Drejtoria e Statistikes, 1970).

The collectivisation of agriculture is important, not just because of the changes it brought to the agriculture itself, but also, because it brought a lot of changes in the rural structure of the population as a result of the movements of the labour force, and from the unification of different villages (there will be a more detailed analyses later in this chapter). Secondly, through the collectivisation, the State took complete responsibility for education, health, food supply, as well as the whole social life of the population.

Although, the Albanian Government tried to keep a balance in its policy of development, between agriculture and industry, the main focus of this development for 50 years was going to be the industrialisation of the country. The Albanian Government based its policy on the Stalinist model of rapid industrialisation. Disregarding advice from the Soviet Union, the Albanians developed not merely light industry, but also heavy industry. This was related to Enver Hoxha's goal "of making the country economically as self-sufficient in as many fields as possible" (Biberaj, 1990, p. 68). That is why the development of heavy industry was seen in the later decades of communist rule, as a priority of economic policy. Thus, the Albanian economy, perhaps more than any other Eastern European economies, had to operate under politically imposed constraints.

The communist regime inherited a very limited industrial base. Until 1925 industry in Albania was non-existent. Later, during King Zog's reign, the Italians tried to develop light industry and mineral extraction, especially when they occupied the country in 1939, but World War II put a stop to their efforts and plans. Thus, in 1940 Albania possessed several sawmills, two modern olive oil extraction

plants, a few power mills, some cigarette manufacturing plants, a brewery and a cement factory, as well as several plants manufacturing furniture, handmade tools and other craft items. On the other hand the country was very rich in terms of mineral resources. The communists also inherited a mineral extraction industry with an average annual production of 1,500,000 barrels of petroleum, 5,500 metric tons of coal, 26,000 metric tons of chrome one, and other minerals including cooper, bitumen, bauxite, and nickel (Skendi, 1956, p. 179, 182, 184, 190). Although, the annual output of the mining sector was low, the reserves were extensive enough to develop a modern based mining industry.

One of the first measures applied by the communists, in order to get control of the economic life of the country was the confiscation of all industrial operations and other economic activities in the country. This was legalised in December 1944, when a Law on confiscation was approved, based on which "all Albanian industries and enterprises are[were] placed under state control" (Gazeta Zyrtare, 1945). After the industries, the nationalisation of banks, the transportation system, foreign and wholesale trade, mineral resources, pastures and forests followed. This confiscation was carried on without any compensation at all. Thus, at the end of 1946, 87% of the total industrial production was controlled by the state, and a year later all the private production of the industry was totally eliminated (Prifti, 1978, p. 53).

Based on the Soviet experience, Albania adopted the principle of long-term economic planning. At the end of the second five-year plan in 1955, it was announced that a light industrial base was created, and that Albania had now become an agricultural-industrial country. The total output of the mineral industry increased dramatically. Thus, in 1954 coal production was increased to 115,960 m.t. from 5,500 before WWII, while chrome ore production was 115,500 m.t., up from 26,188. It is important to mention that in development of industry during this period, a great impact was given by credits and aid from the Soviet Union. The total amount of unpaid credits and aid given to Albania by 1959 amounted to about a quarter of a billion US dollars (Prifti, 1978, p.78).

In the later economic plans of the Albanian economy, the focus still remained the intensification of industry, but now with a more difficult priority - the construction of heavy industry in Albania. Until the mid-seventies, the Albanian government was moderately successful in industrialising the economy. The government's rapid industrialisation policy had led to the creation of a relatively modern multi branched industry, which by 1985 was generating 43.3% of the total national income (Golemi et al., 1987, p. 180). Much of this success was due to the Chinese as well as Soviet credits

and technical assistance. The grand total of the Chinese loans to Albania for the period 1954-1975 amounted to approximately US$ 500 million (Marmullaku, 1975, p. 96).

Shortly after the break with China in the late 1970s, industry, as part of the whole economy, showed signs of declining. For a period of five years the communist government used the accumulated reserves to maintain the momentum of growth in industry, but the self-isolation made the transfer of technology from the developed countries of Western Europe impossible. Thus, the early eighties mark the beginning of the stagnation of Albanian industry and the whole economy, and by 1990 the industrial sector had collapsed totally.

One of the more significant results of industrialisation of Albanian economy was the change of rural-urban ratio. The urban population grew from 15% in 1938 to 36% in 1989. Although, the growth of urbanisation has not been as fast as in other East European countries, this increase to 36% marks a significant change, when compared with the figure of 85% for the rural population in 1939. The industrialisation brought also a change in working pattern for women, who in 1989 made up 47% of the total labour force.

2.2 ECONOMIC IMPLICATIONS

2.22 Economic Performance

It is difficult to describe the general economic performance of a country over a period of 50 years, not because of its complexity, but because of the up and down swings of the economy itself. For the Albanian economy, there are two main phases of economic performance that can be clearly separated from each other. The first one is the period from 1945 to 1975, and the second one from 1975 to 1990.

During the first period, the Albanian economy was relatively successful. It grew substantially until the break with China in the seventies. The growth of the Net Material Product from one five-year plan to the next was, on average, nearly 44 percent, with industry recording the fastest growth rates during this period. The average growth of industry from 1951 to 1975 was 82.5 percent (Blejer et al., 1992, p. 10, 11). The share of agriculture declined from 80 percent during the first five-year plan (1951-55) to 36% in the fifth plan (1971-75), while the corresponding figures for industry were 14 percent and 35 percent, respectively. It was not just that the industry that experienced rapid growth, infrastructure was also developed. The country's highway system was greatly expanded, and by 1985

consisted of 6,900 kilometres of roads capable of carrying motor vehicle traffic, and with a small rail network of about 603 kilometres (Pano, 1992, p. 46). Within industry, the mineral sector and the electricity generation were initially developed. During 1956-60, the production of chrome made great strides, giving Albania first place in the world in per capita production of chrome ore, and later in the eighties the third place in the world for total output. Because of the large number of rivers and their mountainous nature, Albania developed its hydro-electric potential HEP, estimated at 2500 MW, second to Norway within Europe. Thus, in the eighties Albania reached agreement with neighbouring countries (Yugoslavia and Greece) to supply them with electricity.

However, while Albania reached a surprisingly high level of economic development during the seventies, it has to be emphasised that the government could not reach its goals of development without financial and technical assistance from USSR and China. Most of the five-year plans faced large balance of payments deficits that were financed by Soviet and Chinese capital inflows.

In contrast with the previous period, the eighties witnessed a marked slowdown in economic activity, which virtually stagnated during the second half of the decade, reflecting Albania's self-imposed isolation since 1976 and the emergence of serious internal and external imbalances. The real NMP, which had grown by nearly 44% in the previous period 1970-1980, but in 1980-1989 rose only by an average of 1 percent per year, declining from an average of 1.6 percent during 1980-85 to no growth during 1985-90. Real GDP followed a similar pattern, growing by 1 percent during 1980-1990, declining from 2 percent during 1980-85 to a marginal negative growth during 1985-90 (see Table 2.1).

Table 2.1 Net Material Product and Gross Domestic Product. 1980-90

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
						(In constant 1986 prices)					
NMP	12198	12929	13281	13350	12964	13200	14013	13700	13631	15223	13229
GDP	14881	15737	16200	16378	16174	16462	17390	17254	17008	18681	16234
						(Annual percentage change in constant 1986 prices)					
NMP	.....	6.0	2.7	0.5	-2.9	1.8	6.2	-2.2	-0.5	11.7	-13.1
GDP	.....	5.8	2.9	1.1	-1.2	1.8	5.6	-0.8	-1.4	9.8	-13.1

Source: IMF - 1992, Albania: From Isolation Toward Reform, M. Blejer et al., p. 12

Although Albania made considerable economic progress under the communist regime, it still remained

the least-developed country in Europe with an estimated per capita gross national product of US$ 930 in 1986 (Pano, 1992, p. 47). There are many reasons that sent the Albanian economy into a dead-end street in the eighties. Most significant are the orthodox objectives and methods of management of the communist leadership; the lack of investment in the economy, which brought about a lack in advanced technology; and, most of all, the self-isolation of the country, which brought the Albanian economy to a state of total collapse in 1990.

2.23 The Economic System - A command type of economy

Based on the experience of the Soviet Union, the Albanian Communist Government introduced a central planned economic system. By 1951, the government replaced all the existing market forms and mechanisms by central planning. From then on the centralisation of the economy was intensified. The planning system was based on Five Year Plans, where all the economic decisions on production, pricing, wages, investments, external and internal trade were made at the beginning of the plan, and remained unchanged for the whole period. Changes between the plans were also minimal in terms of wages and prices.

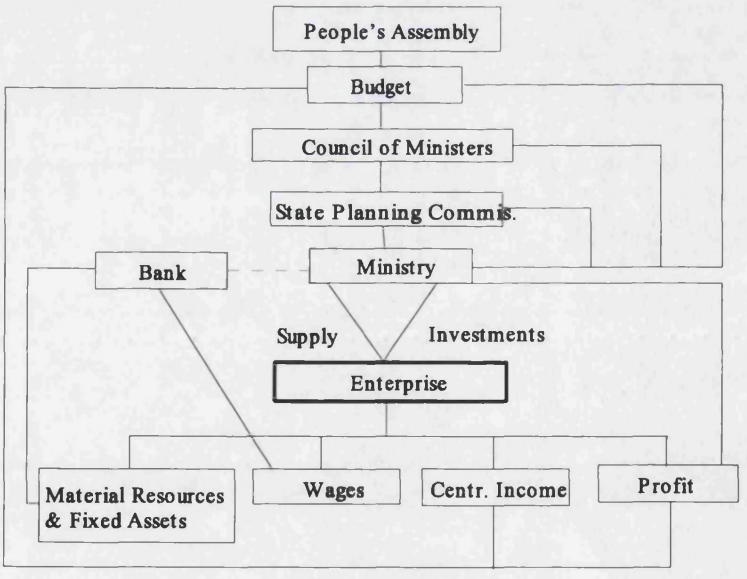
Very centralised decision-making system was introduced. The Council of Ministers was at the highest level, followed by branch ministries, executive committees (local governments, which had more a controlling and informative function than a planning one) and the state enterprises (see Figure 2.1). The only technical institution which was in charge of formulating the plans, prescribing the physical quantities to be met by each productive unit, was the State Planning Commission, which was directly dependent on the Council of Ministers. All the planning was based on a detailed approved budget from the Council of Ministers.

All economic activity originated in the investment made by the state through a single channel - the state budget. All the investment activity was decided by the branch ministry, state planning commission or equivalent body. Each enterprise was required to follow strictly an agenda laid down by higher authority, which decided the supplies of inputs. The enterprise was allowed to contract for its supplies only within the plan quotas and through the ministry branch or district Executive Committee.

In 1957, as a result of Soviet advice, the Government unified all prices in the market (both in state and cooperative ones). These prices remained largely unchanged, setting the scene for increasing

subsidies from the budget. In order to meet the price increases in 1957, a one-off wage adjustment was also introduced in 1957. After that, no significant price and wage policy changes were introduced. What was true for the supplies of inputs, prices or investments, was also true for wages to an even greater degree. They were also centrally determined. The enterprise was allocated a fixed fund for wages, and no change could have been made to that base. The number of workers was also fixed, and so was the employment structure. Similar to other centrally planned economies, labour mobility has been low. Since full employment was a central government policy, it was not uncommon for the government to increase the number of workers in an enterprise without a corresponding increase in the labour demand by the enterprise. The distribution of profits realised from the enterprise was also centralised from the Government. Up to 1990, more than 90 percent of the profits, and 79 percent of the depreciation funds of enterprises were administratively transferred to the State Budget (Blejer et al., 1992, p. 8). In response, the budget was responsible for financing all the activity of the enterprise, and also covering the losses.

Figure 2.1 The centralisation of Albanian Economy.



At the micro economic level, there were two principal forms of productive units in the economy: state enterprises operating in industry, agriculture, and trade sector, and the agricultural cooperatives. Like all government institutions, the internal organisation of the enterprise was hierarchial. The directorate of the enterprise had no economic decision-making power and relied completely on directives from the relevant branch ministry or the executive committee. The average employment level was more than 700 workers per enterprise in 1989, with the largest enterprise employing more than 4000 workers. The enterprises operated as state institutions, their expenses were covered by the state budget, and all their output was surrendered to the Government. The second form of the organisation, the agricultural cooperatives differed from the state ones, mainly in terms of their financial relationship with the

budget (less than 10% of their profit was transferred to the budget, while most of their investments were financed either by bank loans or were self financed), and in their wage policy (it was internally determined and a function of the revenues they generated).

The next section describes some social implications of the political and economical changes in Albania.

2.3 SOCIAL IMPLICATIONS

2.31 Income Distribution

Up to the early 1960s, Albanian pay scales were similar to those in the rest of communist Eastern Europe. By the mid-1960s, income differentials up to 4:1 were thought to have occurred (Schnytzer 1982, p. 113). In 1967, after the break with Soviet Union, attempts were made for equalisation by reducing the highest salaries. The aim was the narrowing of the differences in the way of living between the urban and rural areas as well as between different social classes. The new pay system that came into force in September 1967, was relieved of certain excesses in incentive payments. However, "supplementary" payments were still significant in making up wage packets, while the ratio between the highest and the lowest pay ranged from 1:2.5 to 1:3 (Hall 1994, p. 69).

An April 1976 law planned for "The reduction of high salaries, some improvements on the pay system of working people and the further narrowing of the differences between town and country". This law provided:

- "The reduction of high salaries and also made certain improvements in the system of wages and remuneration of the working people".
- "The reduction of main differences between urban and rural areas" (P.H. "8 Nentori", 1982, p. 328).

Thus, income equalisation was taken further, particularly in regard to the differences between rural and urban areas and northern and southern areas. The result was the reduction of a number of payments, such as those to teachers and scientists and the bonuses for scientific titles, and the increase of the wages of the state farm workers. As a result, the ratio between the average pay of the employees and the director of an enterprise was 1:1.7; the ratio of the average pay of the workers in general and the salary of a director of a ministry was 1:2, and the ratio between the

lowest and the highest wages of the workers in a given sector, was about 1.5:1.65 (Bollano 1984, p. 21).

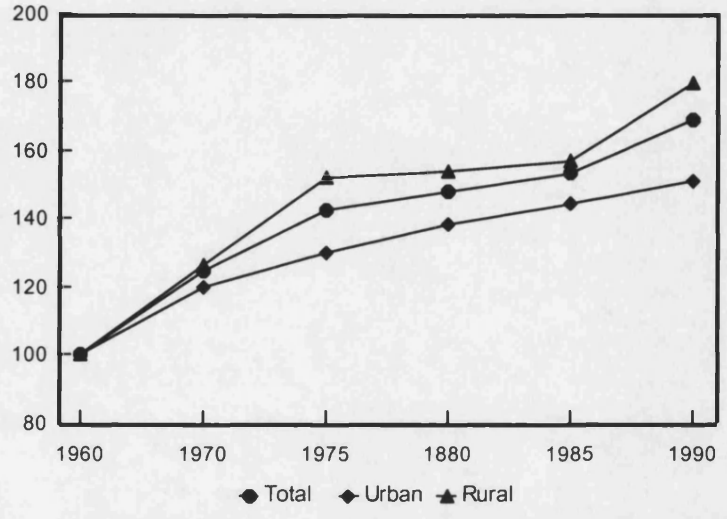
From figure 2.2, and table 2.2, it can be seen that the total real income per capita increased during 1970-1975 by 14.5%, while that for the rural workers increased by 20.5% compared to only 8.7% for urban workers. This policy was clearly aiming to narrow the differences between rural and urban areas, as well as between professions. This policy was also aiming to improve the living standard in rural areas. In 1972 the cooperative peasantry were for the first time provided with state pensions. Various other policies gave priority to rural rather than urban areas, and to uplands rather than lowlands. As Sjoberg and others have emphasised, "these measures were explicitly used as a means to reduce urban-rural income and living standard differentials, which in turn, it was thought would encourage people to stay on the land..." (Sjoberg and Wyzan, 1991).

Table 2.2 Real Income per capita *in Leks*

Year	Total	in% (1960=100)	Urban	in% (1960=100)	Rural	in% (1960=100)
1960	2155	100	2840	100	1738	100
1970	2684	124.5	3395	119.5	2193	126.2
1975	3074	142.6	3691	130	2642	152
1980	3191	148.1	3932	138.4	2672	153.7
1985	3305	153.4	4090	144	2736	156.8
1990	3640	168.9	4277	150.6	3120	179.5

Note: 1960 is taken as the base year (100)
Source: Statistical Yearbook of Albania 1991, p. 131.

Figure 2.2. Change in % of Real Income per capita.



Note: 1960 is taken as the base year.

As a result of all these measures Albania became the country with the most equal income distribution. This, taken with the complex of other measures, had an impact on the health status of the population, especially in the rural areas. The increase in living standards

in the rural areas, was very important for a country with 75% of the population rural, and that was emerging from a semi-feudal past.

On the other hand, it could be mentioned here that, although the rural-urban differences as well as those lowland-upland narrowed, they never disappeared. This was also result of the negative effect of a number of economic measures such as the creation of "High Type Cooperatives" (HTCs), etc. In HTC's, the state became a part-owner of the cooperative to the extent of its investments in it This reduced the extent of the private ownership and at the same time increased state involvement and financial responsibility. HTCs were only created in agriculturally favoured areas, such as the coastal and inland plains, thus discriminating the upland areas.

2.32 Education Improvements

The end of the second World War found Albania in a very poor educational state. At that time 80% of the population was illiterate, and in the rural areas this figure reached 90-95% (P.H. "8 Nentori", 1982, p. 379). Illiteracy was widespread in rural areas and in particular among women. Immediately upon seizure of power in 1944, the communist regime gave high priority to opening schools and organising the whole educational system along communist lines. An intensive campaign against illiteracy started immediately. The slogan "In order to build we must know, and in order to know we must learn", was issued country-wide (P.H. "8 Nentori", 1982, p. 379). The campaign against illiteracy was legalised by the Educational Reform Law in 1946, which made the "struggle" against illiteracy the goal of the new education system. This law introduced a new system of education with a pre-school system up to the age of five, a seven year primary school, and a secondary school. In 1952, education was made compulsory for children 7-14 years. A further step against illiteracy was made in 1949, when the government promulgated a law requiring all illiterates between ages twelve and forty to learn to read and write (Keefe et al., 1971, p. 86). As a result during the period 1955-1956 illiteracy was effectively eliminated among all people under forty. An 8-year elementary and 4-year secondary school education structure was instituted and schools for training skilled workers were established. Night schools were also opened to give adults the opportunity to begin or to continue their education without leaving work (Skendi, 1956).

More measures were taken in 1950, especially emphasising the expansion of secondary technical schooling. Secondary technical schools were established along Soviet lines. By 1950 Albania had professional secondary schools for medicine, finance, commerce, the petroleum industry and

agriculture. After some higher institutes were opened in the capital and other main cities, in 1957 the State University of Tirana was formed while in 1971 the Academy of Sciences was established (Hall 1994, p. 76). The reforms in education offered greater opportunities to wider population groups and as a result general standards of education were raised dramatically. The last education reform was that of 1970. A uniform system of separate elementary and secondary school programmes was introduced, and all secondary school curricula were standardised, to comprise 55% academic work, 27% production (applied work), 18% military training and physical education (Hall, 1994, p. 75)

Table 2.3. Number of schools and number of students graduated from schools, 1950-1990.

Number of Schools						
	Pre-school		Primary		Secondary	University
	Urban	Rural	Urban	Rural		
1950	93	62	82	111	23	1
1960	230	204	132	425	69	6
1970	378	1045	187	1187	131	5
1980	666	2001	212	1347	280	8
1990	804	2622	245	1481	513	8
Number of Students Graduated from Schools						
	Primary (000)		Secondary (000)		University	
1950	4.3		0.5		-	
1960	11.2		2.4		690	
1970	34.6		3.5		1613	
1980	60.4		28.0		2877	
1990	60.5		35.5		3990	

Source: Statistical Yearbook of Albania 1991.

In terms of enrollments, Albania had a broad-based education system, with almost 90% of the pupils completing the compulsory basic 8-year school and 74% of them continuing into secondary school. From these, more than 40% went to the university[3]. According to official figures, at the end of 1972 there were 700,000 schoolchildren and university students, which meant that every third citizen was enrolled in some kind of educational institution (Kellezi 1973, p. 39). The number of kindergartens in urban areas increased by 112% from 1970 to 1990, while in rural areas it increased by 150%. The number of primary schools in urban areas, for the same period of time, rose 31%, and in rural areas

[3]Calculations based on data from: "Statistical Yearbook of Albania, 1991"; Golemi and Misja, 1987; and Albanian State Archive, Documents on SPC - Statistical Directory, Fond 895, Year 1985-1990.

24%. The total number of secondary schools increased by 291%, and that of high schools by 60%. A similar trend is seen for the number of students that graduated. Thus the number of pupils that graduated from primary schools for the period 1970-1990 increased by 74.8%, for the secondary school, the number rose 914.2%, and for university 147%. Education tuition was free of charge. Students whose families had low incomes were entitled to scholarships, which gave them free accommodation, food, etc. (Marmullaku, 1975, p. 79).

While the expansion of education and educational establishments has been rapid, these national averages, however, conceal a regional variation of some magnitude. A regional division exists for trends and levels, between North-East and South-West of the country. The southern districts of Kolonje, Permet, Tepelene, and Sarande, were above the national average, while the reverse holds for the northern districts of Puka, Mirdita, Gramshi, Kukesi and Dibra (Golemi and Misja, 1987, p. 184; Sjoberg 1991, p. 71). Regional differences in education have also been noted by Vejsiu in 1981. Some of the reasons why the northern mountainous areas lagged behind in educational level, could be the level of urbanisation, tradition, religion, and age-structure. The influence of this complex of factors is also reflected in the differences in mortality.

Although the enrolment performance was impressive, this could not be said for the quality of education. The schools were modelled on Soviet lines. They suffered from overcrowding and lack of facilities and teaching materials. The principle of "self- reliance" cut Albania out from the developments in the outside world. Specialists and relevant literature were lacking in most fields of education and the censorship, restrictions and the lack of personal freedom only made the situation worse. Nevertheless, the achievement of universal education must be judged one of the communist regime's main achievements.

2.33 Emancipation of women and their role in society.

The emancipation of women, their education and employment has been considered as an important factor that influences health and demographic changes in a country (Caldwell, 1986; Caldwell and Caldwell, 1991). For most women, traditional Albanian life was characterised by discrimination and inequality compared with men, reinforced by a wide range of cultural norms. While the Canon[4]

[4]Canon, or "Canon of Lekë Dukagjini", is a 13th century set of norms and rules governing life and behaviour of individuals and tribal organisation in Northern Albania.

subjugated women particularly in the northern upland area, religion abetted their oppression in the rest of the country. The birth of a girl was considered a burden and a misfortune on the family. Most of the marriages were arranged and polygamy was the norm in some Muslim areas (Hall, D., 1994, p. 82). In the immediate pre-war period there were just 21 female teachers in the country, a couple of women doctors and no female engineers, agronomists or chemists.(Ash, 1974, p. 235). Only 2.4 per cent of secondary school students were girls (EBNA, 1984, p. 212).

When the communists came to power they considered the emancipation of women as an important political measure, linking it with the destiny of socialism and communism. Marriage and divorce were regulated by the 1946 constitution. Marriage rates increased from 5.8 per thousand in 1938 to 8.5 by 1985, one of the highest levels in Europe (Hall. D. 1994, p. 83). Equality between men and women was stressed continuously and was even included in the Constitution. The Introduction to the Constitution of the PSR of Albania says that "In the unceasing process of the revolution, the Albanian woman won equality in all fields, became a great social force and is advancing towards her complete emancipation". Article 41 of the constitution says: "The woman enjoys equal rights with a man in work, pay, holidays, social security, education, in all social-political activities as well as in the family" (Kuvendi Popullor, 1976, art. 41). Although the authority of the master of the family was greatly reduced, the old patriarchal system survived, especially in the highlands. In addition to being expected to work, under communism Albanian women were given little choice but to procreate: there was no birth control availability nor public discussion about it. Despite that, the average size of the family diminished substantially, most noticeably in the towns and cities.

Table 2.4 Proportion of Women in the labour force

Sectors of economy	1960	1970	1980	1985	1990
- Industry	27.8	44.2	43.4	44.0	44.5
- Construction	5.7	9.4	9.0	8.5	9.5
- Agriculture	43.8	52.8	52.2	52.5	52.2
- Transport&Communication	6.7	14.9	15.8	15.4	15.9
- Trade	39.6	39.6	53.3	54.1	54.5
- Education & Culture	41.4	48.7	50.5	52.8	53.0
- Health	72.3	77.5	78.7	79.7	80.5
- Others	19.6	37.9	38.3	41.7	21.3
Total	35.9	45.3	45.9	46.6	45.1

Source: D. Hall, "Albania and the Albanians", UK, 1994, pp. 84.

Equal rights included amongst others the equal right to have a job. Subsidised day-care nurseries and

kindergartens, laundrettes and canteens at both workplace, and in residential areas were provided, to make it easier for mothers to work. By 1980 women made up 46% of the economically active population, an increase over one quarter compared with 1960(see table 2.4).

Educational opportunities for women also improved considerably. Table 2.5 shows the increase in the percentage of students who were women graduating from university according to specialities. The table shows that the increase in the percentage during the period 1960-1990, for women engineers was 258.6%, while that for agronomists was 206%, for economists 192%. The same policy was adopted for the participation of women in governing of the country.

Table 2.5. Percentages of women graduated from the university

Specialities	1960	1970	1985
Engineer	5.8	10.6	20.8
Agronomist, Veterinary	6.6	3.7	20.2
Economist	17.1	17.8	50.1
Doctors, Dentists, Pharmacy	18.6	28.2	48.5
Teachers, etc.	25.3	26.4	43.4

Source: Golemi B., Misja V., - "Zhvillimi i aresimit te larte ne Shqiperi" (Development of higher education in Albania), Tirana, 1987.

It should also be emphasised that there were large regional variations concerning women's role between urban-rural areas as well as southern and northern regions and that these differences may have influenced in the differences in mortality rates.

2.34 The Health System

One of the key policies of the Communist Government from 1950-1990, was the improvement in the health status of the population - "Health of the population (of the labour force) - centre of the government policies" (P.H. 8 Nentori, 1982). As explained earlier in this Chapter, when the communists took over in Albania in 1945, the state of population's health and the Albanian health system were in a very bad state. Before the War, the health system consisted only of 10 state hospitals and an Institute of Hygiene founded in Tirana in 1938. The number of doctors was very low - only 102 Albanian doctors and a very small number of foreign doctors. Thus, the number of physicians (doctors and dentists) per 10,000 of the population was only 1.17, while the number of beds for 1,000 of population only 0.98 (see Table 2.6). Ambulance stations and medical officers were

provided in all municipalities, while travelling medical officers visited villages examining schoolchildren. The share of health expenditure was only 1% of the state budget. If anything, the situation deteriorated during the World War II.

In order to address this situation, the government starting in 1947, introduced a wide-ranging social insurance and medical scheme. Most medical treatments (thought not the medicines) were provided free. Legislation was introduced to protect the mother and child, and set up the pension scheme, as well as other regulations on sanitary conditions and control, and for the treatment of infectious diseases.

The health system during the communist period in Albania was characterised by: i) universal entitlement to a full range of medical and dental services; ii) a public sector monopoly on service provision and drug supply; iii) centrally-planned resource allocation based largely on input levels (beds and staff) rather than services rendered; iv) centralised management systems, which offered few incentives to improve the quality of care, increase efficiency and control costs.

Table 2.6. Health Indicators of Albania

	1938	1950	1960	1970	1980	1990
1. Physicians per 10000 pop.	1.1	1.1	3	7.4	16.8	17.1
2. Beds per 1000 population	0.98	4.4	5.4	4.1	6.5	5.9
3. Health expenditure in % of Total Government Expendit.	1.0	4.9	5.9	5.3	5.3	6.6
4. GP consultations per 1000 of population		614	1220	2223	2970	3399

Note: 1950 Figure on health expenditure refers to 1952
Source: Albanian State Archive, Statistical Yearbook of Albania

The most significant improvements were made during 1960-1970, through a rapid build-up of infrastructure and training programmes. A number of endemic diseases were brought under control (more details will be given in chapter 5), including malaria, tuberculosis and syphilis. In 1980 there were 6.5 hospital beds per thousand population, compared with only 0.98 in 1938, and 4.4 in 1950 (see Table 2.6). By 1990 this had fallen to an average of 5.9 beds per thousand population. This reduction was due to the start of the collapse of the health system in Albania. The proportion of physicians and dentists rose from 1.1 per ten thousand population in 1938 and 1950, to 16.8 and 17.1 respectively in 1980 and 1990. The significant increase in the number of nurses and midwives in

1980s, and the fact that about 50 percent of physicians were non-specialists, reflected the priority given to primary health care by the Government - a cost-effective solution for a country with such limited resources. The Government increased health expenditure from 1% in 1939 to 6.6% in 1990. In fact this is significantly high, considering that those expenditures were mainly made in Primary Health Care. In fact we can say that the investment of the government in primary health care was a pre-condition for the mortality improvements in Albania. In 1980 there were about 800 medical institutions distributed across the country, with most urban centres having more than one hospital, while the number of GP consultations per thousand of the population rose from 153 and 614 in 1938 and 1950, to 3399 in 1990.

The government also pursued a policy of directing medical personnel to the country's more remote areas. By 1971, every village was said to have its own medical centre. More than 80% of health and medical institutions were located in the villages. These measures were vital for a population that was 75% rural (Hall, 1994, p. 71).

The Government paid great attention to the health of mothers and children. This was very much related to the high maternal and infant mortality rates in pre and post-war Albania (infant mortality rate was 143.1 in 1950). Health centres for mothers and babies were established in both urban and rural areas. Mother's health was monitored regularly before and after pregnancy. Subsidised day-care nurseries and kindergartens were set up to make it easier for mothers to work, as well as to provide good care for children (Cikuli, 1982). In 1981 the period of paid maternity leave was extended to 6 months, with the woman's right to return to her job, protected by law (Berxholli, Qiriazi, 1986, p. 61). Medicines and treatments were given free for mothers during pregnancy, and for mothers and babies for a period of one year after the birth. A social benefits scheme for mothers with more than two children was introduced in 1953. Based on the number of children and the family income, mothers were given financial help from the state (Gazeta Zyrtare, 1953, art.2). Medical care before and after the birth was a major contributor to the reduction of infant mortality, especially the provision of medical assistance during childbirth. In 1938, only 0.4% of women gave birth in a maternity department in the capital (there was only one), while in 1960, this figure was 38%, in 1976 it rose to 76%, and in 1982 reached 99.4%. Child consultation centres were established, where children's health was regularly checked up to the age of 3. A system of vaccinations was also introduced in those centres for children (the vaccination was compulsory, and the coverage achieved was 95%) (Cikuli, 1982).

While the health services were considerably expanded and developed, the quality of these services is another matter that required attention. There is not much evidence on the quality of those services, so it is hard to draw a firm conclusion. After the break with the Soviet Union and then China, there were shortages of equipment. As Albania grew increasingly isolated, medical personnel were cut off from global advanced technology and pharmacology, while the local drug industry became locked into outmoded production lines and processes. The limited pharmaceutical industry and the lack of hard currency to import drugs and equipment meant that health workers had no choice but to prescribe inappropriate therapies. The dogma of self-reliance exacerbated this problem, and only a small number of people were able to leave the country in order to get better medical treatment. The regime took pride in its network of facilities, favouring construction of new infrastructure at the expense of maintenance and operating expenditures of existing facilities. By 1989, Albania's limited resources could no longer support this infrastructure, and a decline in services took place.

2.35 Social Security

Social Insurance was first introduced by the Albanian communist government in 1947. The initial social security scheme covered approximately 75,000 people (Skendi, 1956, p. 265). The social insurance program was administered by state organisations and covered medical care, compensation for disability, old-age pensions, family allowances, and rest and recreation. Several modifications were made latter to the basic program. The law of 1953 provided a program closely resembling that of the Soviet Union, i.e. a classic cradle to grave system of social security. For a number of years trade unions administered a large number of social insurance activities. In 1965 the state took over the administration of all phases except those for rest and recreation facilities.

The social insurance program, as provided for in the Council of Ministers decision of 13th September 1966 that came in effect on 1st January 1967, included benefits for workers, employees and others. Peasants of the agriculture cooperatives were excluded, but similar welfare benefits were provided from funds established by their organisations (Keefe et al., 1971, p. 63). The 1966 law was a continuation of the policy announced on 1964 that free medical care was provided to everyone. Drugs that were prescribed to patients had to be paid except for children under one year, their mothers and pregnant women. Funds for social insurance came from the state budget. Contributions were paid by state institutions and enterprises that were in the role of employers. Workers who became ill and needed time off-work received payments of 70-100 per cent of their wage depending on the type of job, how many years they had been working and the cause of disability.

If people lost their capacity to work totally or partially, they were granted invalidity pensions. The amount of the pension varied between 40-85% of the wage depending on the scale of invalidity, cause of invalidity and the number of years that the person had been working. Pregnant women were given eighty-four days leave under normal circumstances and were paid at 95% of their wage if they had worked for more than five years and 75% if they had worked less than five. The pregnancy leave period was extended to six months in 1981. Workers could stay at home for limited periods to care for the sick and during this period received 60% of their pay. When children under seven years of age were ill, one of the parents was permitted up to ten days leave during a three month period. A one-time payment was made to the family for each child that was born. In case of death a fixed sum was paid to the family for funeral expenses (Skendi, 266-69, 1956 and Keefe et al., 1971, p. 64).

Old-age pensions were based on age and years of work. Payments were calculated at the rate of 70% of the worker's average monthly wage. Two exceptions were the veterans of the Second World War and the Party leaders who received an additional 10%. The law also provided for widow's and orphan's pensions.

All insured persons were entitled to a paid vacation. The duration of the vacation depended on the type of work and the length of active employment.

In spite the stated intentions the system was not homogenous. Although all the population was covered, there were inequalities between people that lived in towns and cities and those that lived in the villages.

From 1st July 1972 the system of pensions and social security was extended to cover peasants working in agriculture cooperatives. This aimed at the narrowing of the differences between urban and rural areas. Some agricultural cooperatives had already introduced some forms of pensions and social insurance providing help for their members in old age and when they were unable to work. The financing of this social security system in the rural areas came from the contributions of the cooperatives with some subsidisation from the state (P. H. "8 Nentori", 1982, p. 374-5).

2.36 Urbanisation and internal migration

Until 1949, Albania was divided into ten prefectures, or administrative districts. The largest ones

were Berat, Elbasan, Gjirokaster, Korce, and Shkoder. The communist regime initially effected three major administrative divisions after it seized control of the country. In March 1949 the former prefectures were abolished and *Keshilla Popullore* (Soviets) were created; these included districts (*rrethe),* cites (*qytete),* localities (*lokalitete),* and villages (*fshatra).* There were 26 districts with a total of 185 administrative units. The second major change occurred in July 1953 when 10 regions were created corresponding to the previous 10 prefectures, with 53 districts and 47 localities. A further change took place in January 1956, when the country was divided into four regions, 34 districts and 104 localities (Skendi, 1956).

The government made its policy to promote agriculture and local industry in all parts of the country. Mining and agriculture largely determined the distribution of economically active population, but in Albania the location of natural resources did not necessarily coincide with the centres of population.

Industrialisation affected Albania, although considerably less than other East European countries. The government plans included urbanisation and internal migration, the gradual increase of city population, particularly in the capital, mining towns, port and industrial cities. Despite the increase in the number of people living in the cities, Albania maintained the lowest level of urbanisation in Europe. In 1930, approximately 14% of Albania's total population lived in towns; this figure increased to 20.2% in 1949-1950, 33.5% in 1979 and 35.5% in 1989 (Hall 1994, p. 67).

Three factors account for these low figures. First, an explicit rural-led development programme which, despite industrialisation, saw agriculture and agro-industry as being prime economic importance to the country's development. Second, the maintenance of a higher rate of natural increase of the rural population. And third, constraints on rural to urban migration, such that the officially quoted figure for this movement in the later 1980s was just 0.4 % of the rural population per annum (Hall, 1987; Sjoberg, 1989).

Between 1950-1986 the amount of arable land in the country doubled through terracing, irrigation, drainage and desalination schemes. Nevertheless, the large increase of population during the same period, saw the amount of arable land per person actually decrease by 10 per cent. This process accelerated during the 1980s (Hall, 1994, p. 67). As a consequence of policies that emphasized rural development and particularly for the upland areas, Albania had a rural population that increased in absolute, if not in relative terms.

Internal migration was planned and restricted. Free movement of population in the country was not allowed. During the period of early industrialisation 1951-1955, the country's urban population increased by 52 per cent, about 82 per cent of which was attributable to in-migration (Geco, 1970, p. 161-82). This had a negative effect on rural development and agriculture output. By the end of 1950s, rural-to-urban migration was contained so that it became of secondary importance to natural increase in contributing to urban growth (Geco, 1973, p. 53-71). Average annual rural-to-urban migration rates of 3.5 per thousand of total population were reported for the 1960s, and 2.7 per thousand for the 1970s (Misja, Vejsiu, 1982, p. 13). From the mid-1970s this rate slowed down to 6-7 thousand people per year, while in mid-1980s it was reduced to 2 per thousand of total population (Skenderi, Vejsiu, 1983, p. 161; 1984, p. 34). There has been no reporting on the levels of urban-to-rural migration.

2.4. CONCLUDING NOTES

Overall, how can we characterize communist Albania?

Clearly, in spite considerable economic development relative to its previous level, it remained poor and mostly rural. However, the social agenda of development made much more progress. Education and social security became virtually universal and health care, was available to all. Moreover, traditionally severe discrimination against women was greatly reduced.

Thus, in spite of its isolation and the intense political repression, Albania made progress in aspects of development often seen to be relevant to health transition. Later chapters will show the ways in which this occurred.

Chapter 3. DATA DESCRIPTION

3.1 INTRODUCTION

This chapter describes the availability and quality of demographic data for Albania during the period 1950-1990, which is the focus of this study. The availability and quality of demographic data, with particular focus on mortality statistics, is dealt with, as well as applications of various techniques that make it possible to check the accuracy of both census enumeration and the completeness of death registration.

Data quality can usually be taken for granted in Europe. This is not so for Albania. The necessity of describing and analysing the quality of data for Albania comes from two important factors. First Albania was and still remains the poorest country in Europe, and the quality of data in developing countries is always a matter of discussion. The second reason comes from the fact that Albania was a communist country during the period 1950-1990. And when one deals with data from an ex-communist country, a few words are necessary concerning the availability and quality of any data, demographic or otherwise.

Scholars working with demographic statistics in Eastern Europe, especially with mortality data, point out the fact that there are problems with quality of data (Anderson and Silver 1989a, p. 243; 1989b, p. 615-6). Some of them are problems related to the methodology of calculation, some related to the system of data collection and in fewer cases there are intentional distortions in order to conceal particular phenomena.

When Albania is considered, all these factors need to be considered. Immediately after World War II, the country was very undeveloped and this situation continued for a long period, as described in Chapter 2. For almost 50 years the country was ruled by a communist regime, which applied a similar data collection system as in other ex-communist countries, especially Russia. As a consequence, the country's statistics do not just reflect problems related to the lack of development, but also similar problems found in other ex-communist countries.

It is also important to look at the data availability and quality in the country in relation to its progress in development. As explained in Chapter 2, Albania moved from a traditional society to a somewhat more developed one during the study period. This change is reflected in the data availability and

quality.

One factor which is particularly relevant to Albania is the fact that the country was sealed off not only from the West, but also from Eastern Europe, for a long period. This isolation was also reflected at the lack of publications about the country. Statistical publications on Albania were as rare as most other publications. The first statistical yearbook in English was only published in 1991, for example.

In sum, there are several reasons for being suspicious of Albanian data. This chapter assesses how far such suspicion is justified.

3.2 DATA AVAILABILITY

3.20 Population statistics before World War II in Albania

The statistics of population and vital events in Albania started being collected after 1920. This followed the creation of the new state in Albania after its independence in 1912. Independence in 1912 brought about the creation of a central government which started exercising its power only after World War I. Because the country was a battle ground for different armies from neighbouring countries for several years; the collection of statistics on the Albanian population only began after World War I.

However, recordings on the Albanian population date back to the 15th century. In 1431 the Ottoman Turkish conquerors organised a partial recording of the population for fiscal and military purposes. While the Turks organised this population count in the parts of Albania they had conquered, the Venetians collected some information on the Albanian population in those parts they had under their rule, in Shkodra, Lezhë and Durrës (Sheri and Imami, 1962, p. 54).

Partial records were also collected during the World War I by different Western countries that were present in Albania. Thus, the Austrians in 1916 recorded the number of people in the Shkodra region, where they also established a statistical office. The Italians did the same in the south of Albania, and so did the French in the areas they had under control. However, this information was partial, covering only some parts of the country, and very weak in terms of population characteristics, only being head counts, nothing more sophisticated.

The first effort to create a system of vital registration was initiated in 1922, when a system to record

vital events (including marriage and divorce) was enforced. Based on these regulations the vital events should be reported within ten days of occurrence to the 'kryeplak' - the tribal chief of the area, who should report the events to the local authorities - the 'prefecture'. Because no certificate was used to record the vital events, the information on them was inadequate and sometimes inaccurate. A large number of events were not reported, especially births, since a tax had to be paid for each birth (Selenica, 1928). In spite of its inaccuracy, this information is the first that sheds light on the changes in vital events and population growth of the Albanian population before WWII.

The first well organised vital registration system was introduced in 1936, with the creation of the Civil Registration Office within the government. At that time the death, birth and marriage certificates were introduced, thus initiating the creation of a regular vital registration system.

At the same time as the vital registration system was just established, the first efforts were made to conduct a general census of the population. In 1921 the government tried to conduct a partial census in the main 'prefectures' of the country. This effort failed because of the lack of experience and necessarily preparations. The first general census conducted in Albania was the 1923 census, which continued for a period of three months. The information collected in this census was not complete, but the main characteristics related to a population census were asked, such as age and sex, religion and profession, as well as some physiological characteristics, such as height and weight.

This population census had a large number of weaknesses, not just in terms of the information collected, but also in the way it was organised and conducted. The recording was conducted in different localities, such as schools, churches, mosques, etc. rather than in houses. In such circumstances not everyone was counted in the census, especially females and children (Sheri and Imami, 1962, p. 58). There were several different questionnaires, and the same information was not always collected in various 'prefectures'. The population was recorded as either 'resident' or 'temporary'. This classification and the fact that the census continued for three months made it possible for the same person to be counted twice or not at all.

The only publication coming out of this census was *Albania in 1927* by T. Selenica in 1928 (Selenica, 1928, p. CV). As the author himself writes:

> "The population census of 1923, was carried out with a lot of weaknesses resulting in an inaccurate total number of the Albanian population..... This census is not based on statistical science, and the regulations applied in developed countries are not applied. A large number of people are not included,

as well as a large number of villages are not considered at all[1]."

The second population census was carried out in 1930. This census was based on the experience of developed countries and consequently the information collected was more accurate than in 1923. The census was conducted under the supervision of Italian experts. From the organisational point of view a central government body was created, which was in charge of the census. A new questionnaire was introduced, in which the characteristics of each member of the family were recorded. Compared to the 1923, census the information collected was more detailed. Thus, information on education, language, property etc were also collected, as well as the main characteristics of the population (Sheri and Imami, 1962, p. 58). The census was conducted on one day, 25 May 1930.

Although the 1930 population census was an improvement compared with 1923, there has been a lot of criticism of it (Misja et al. 1987, p. 67). For example, the number of people was exaggerated as a result of double counting. Some of the information collected based on particular characteristics (e.g. profession, property, etc) was manifestly inaccurate and consequently useless.

The last effort to record the population before the communists took over was carried out by the Italians in 1940 during World War II. Rather than a census this one was a population count, which was based on the population registers created after the 1923 census, and updated in 1930.

The main conclusion about the population statistics before 1945 is that, although two population censuses were conducted and a system of vital registration enforced, good quality statistics available for that period are rare. There have been only a few publications about the period, and very little effort was made to describe and analyse the population structure and change, or to describe the demographic regime of the country. Nevertheless, these population statistics collected during 1920-1945 are relevant to assess population change and to make various estimates concerning the demographic regime of the country.

3.21 Demographic statistics from 1945 to the present day

This study concentrates on the period from the end of World War II to 1990, which is the period

[1]The original book is in Albanian 'Shqiperia me 1927', This quotation is a translation.

when Albania was ruled by a communist government. As described in Chapter 2, the communists took over in 1944. Immediately after the war a central government was established, which aimed at reconstruct the country by mobilising all human and material resources within the country. In fulfilling this goal one of the first steps to be taken was the collection of statistical information on both of these resources. Thus, in January 1945 the government created the Statistical Directory within the Council of Ministers, which was responsible for the collection of all statistical information. With the creation of this Directory a number of regular censuses started to be conducted and a new system of vital registration was applied.

The first post-war census was conducted in 1945 immediately after the war. This census was also based on the experience of other countries, especially the Soviet experience. A relatively large amount of information was collected with regard to population characteristics, such as sex, age, profession, education, property ownership, etc. This census served to create the new population registers as the basis of the new vital registration system.

Although the 1945 census was an improvement compared to previous censuses, the accuracy of the information collected was still not very high (Sheri and Imami, 1962, p. 63). This is related to the lack of expertise, and the short preparation time. However, the census of 1945 marked the beginning of a period, during which regular censuses were conducted and also comprehensive continuous vital registration system was applied.

After 1945 there were altogether six more censuses conducted in 1950, 1955, 1960, 1969, 1979, and the last one in 1989.The methodology and organisation for these censuses improved as the country progressed in terms of development. This research makes use of these data from 1950 to 1990. A detailed description of the quality of data from these censuses is given in Section 3.30 of this chapter.

Similar progress was made with the vital registration system, new certificates of vital events were introduced and improved with time. On becoming a member of the United Nations, Albania started applying international standards to the collection of statistical information. Thus, the death certificate collected information not just on sex, age, marital status, profession, location and nationality, but also on causes of death. What was more important was that a physician was required to verify the cause of death and sign the certificate. More detailed information was asked in the birth and marriage certificates.

While a large amount of information was collected, and to a certain degree was available for analysis, from both censuses and vital registration, there were no data from any other source, especially individual-level data from sample surveys. This source of information was considered inappropriate by the communist government.

It is very clear that demographic information was collected and was available to the government in Albania, but what has been lacking is access to this information. Some data were available to restricted groups within the country, but it was impossible for different scholars, inside and outside the country, to have access to most of what was collected. This was very much related to the isolationist policy of the communist regime, which was also applied to statistical information. Sjoberg (1991, p. 9) describes the situation as follows:

> "It is difficult to conceive of a European nation where conditions are as unfavourable with respect to access to data. This does not necessarily mean, however, that Albanian statistics are useless".

What Sjoberg describes is also clear when other data publications of Eastern Europe are considered. For example, in the Handbook on Eastern Europe and Soviet Data in 1981, while for almost all East European countries there are demographic and other data available, for Albania statistics were missing, or "were extremely limited" (Shoup, 1981, p. 2).

Data became more readily available after the collapse of communism in 1990. So, in 1991 the first comprehensive 'Statistical Yearbook on Albania' was published, with time-series data for the whole period of communist rule. Scholars are now able to have access to statistical information already published within the country, but more importantly to the sources of information, such as the General State Archive, the Council of Ministers Archive, the Archive of Institute of Statistics etc.

This research is mostly based on data collected in these archives, especially the General State Archive (the State Planning Commission Depository) and the Institute of Statistics Archive. Some of the data used in this study were released for the first time; e.g. deaths by age and sex for the national population and various regions which refer to the early days of communism, cause specific mortality data, data on government budgets, and income distribution during the past 50 years.

Using these data it has been possible to construct the demographic regime and history of the country, as well as analysing the main determinants behind this regime. Perhaps more importantly, access to the data on causes of deaths enable this study to make a more in-depth analysis of mortality changes and patterns in Albania during 1950-1990 than has previously been possible.

Initially Albania adopted the Soviet data-gathering system. Later on, unlike the rest of Eastern Europe, the Albanians changed their system, and even today, many social, medical and economic statistics which are routinely available in other countries of Eastern Europe are not found in Albania. Nevertheless, being relatively similar to Eastern European countries, the data exhibit similar problems found by other scholars in these countries with the registration systems and censuses. The data on Albania, demographic or otherwise, have certain weaknesses, and need careful interpretation, but when taken together they provide a consistent and surprisingly comprehensive basis for study.

Apart from demographic statistics, the archives also hold a large amount of medical, social, and economic information that helps in a better understanding of the mortality transition in the context of wider social, political and economic changes. However, a particular circumstance for Albania is the lack of individual level data with regard to mortality and other demographic phenomena. This lack of individual data arises because sample surveys were not carried out during the period under the communist regime. This limits the extent to which causal mechanisms can be unambiguously determined.

One very important element to point out here is that, this research focuses only on the period up to 1990. This is mainly due to the fact that the country was until then under the communist rule. However, the analysis of demographic changes in Albania after 1990 is also constrained by the fact that the system of data-collection has changed, and in common with most of the administrative structures of the country, the data-collection system has been affected by recent developments, with the country gripped by civil unrest. Thus, many tables on demographic and social indicators on Albania have blank cells for the 1994-1997 period (World Bank, 1997).

3.3 DATA QUALITY

3.30 Census enumeration

3.301 Age reporting in the censuses.

When the quality of the data from censuses is considered, the initial step is to look at the age reporting in different censuses. As mentioned previously, from 1950 to 1990 there were six censuses. Figure 3.1 gives the age pyramids of Albanian population in those censuses (with the exception of the 1955 census).

At all the censuses people were asked for the month and the year of birth. Later in the data-processing phase, this information was converted into the age of population.

Even a quick look at population pyramids shows that there was a large age heaping problem in the early censuses, in particular in 1950 and 1960. There are two important points to emphasise here; first the scale of the age heaping in the 1950 census is very high, sometimes the size of the population for ages ending in 0 and 5 is more than twice the size of the next age groups. And second, the age heaping starts at early ages. For males the heaping starts at age 30, and for females as early as ages 20 and 25.

There are two main reasons for this large age-heaping problem in 1950. 1950 was the year that identity cards were introduced in Albania by the new government, and some people, especially in rural areas did not have a birth certificate. This creates an age heaping at the 'preferred' ages ending with 0 and 5. The other reason is the high rate of illiteracy in the country immediately after the World War II, which was as high as 80%.

When all the censuses are considered, it is clear that the age pattern becomes smoother as we move from one census to the other. This is understandable if one considers the fact that people at ages where the heaping starts in 1950 (30 for males and 25 for females) were either over 70 years old or dead by 1989.

At all censuses age heaping is much more pronounced for females than males. This is related to the existence of a traditional and very patriarchal society in pre-war Albania, where female illiteracy was as high as 90%. Prior to World War II, for a large part of the population, while the men's age was recorded either for military, employment or any other reason, for women no records existed. And that is why, when the age was asked in the census, the ages 0 and 5 were most 'preferable' for a large number of the population, especially women.

Looking at the population pyramid in the 1960 census, although the age heaping is still high, it has moved up with age as the cohorts get older. The male-female difference in age reporting is still significant in this census. Persons at younger ages start report their age accurately, which is related to the introduction of the new vital registration system, and also with an increase in the education of people.

In 1969 a rare phenomena appears, when age heaping is considered - the preferred ages in 1969 are not ages 0 and 5 as in previous censuses, but ages 3 and 8. The answer to this question can be found if one considers the time when the 1969 census was conducted. In 1960 the census was conducted on 2 October, while in 1969 on 1 of April. Previously it was noted that when passports were introduced in 1950, age was recorded for the first time for a large group of the population. Because the time difference between the two censuses, 1960 and 1969, is only 8 years and 6 months, then the ages with the age heaping will not be those ending with 0 and 5 anymore, but 0+8 and 5+8. In such circumstances the heaping in 1969 will appear at ages ending with 3 and 8. Thus, strictly speaking, the data show year of birth heaping, rather than age heaping.

The next two censuses were conducted at 10 year intervals after 1969, thus the age heaping continues to appear at ages 3 and 8, although it becomes increasingly less significant.

One can easily see that by the 1979 census and even more in 1989, the age starts being reported more accurately, and age heaping has almost disappeared by 1989.

3.302 Comparing census enumeration by application of a direct method

A simple comparison of age and sex structure of the population in two censuses can be done in a very straight forward way. If the data from the vital registration system on deaths in the intercensal period exist (by age and sex), than this information permits the application of the "balancing equation" for ages 10 and over. If these data are available one can derive the population of one census from the population of the previous census. Then a comparison of the recorded population at the census and the derived population can be done to check the accuracy of the data collected in the late census.

If the "balancing equation" is considered, then for ages over 10, the following equation can be applied to derive the population in 1989 based on the population of 1979 census:

$$P^{1989}(x+10) = P^{1979}(x) - D^{1979\text{-}1989}(x) + M^{1979\text{-}1989}(x) \qquad 3.1$$

where:

$P^{1989}(x+10)$ - the derived population in 1989 in the age group (x+10)
$P^{1979}(x)$ - the census population in 1979 in the age group (x)
$D^{1979\text{-}1989}(x)$ - the intercensal deaths (1979-1989) of the cohort aged (x)
$M^{1979\text{-}1989}(x)$ - the net migration during 1979-1989 of the cohort aged (x)

As mentioned above Albanian society was almost totally closed. People were not allowed to move in or out of the country. In such circumstances the Albanian population can be regarded as closed to migration. Thus, the last parameter in the equation 3.1 can be neglected, and the population of 1989 can be derived by a simpler approach given by equation 3.2:

$$P^{1989}(x+10) = P^{1979}(x) - D^{1979\text{-}1989}(x) \qquad 3.2$$

Table 3.1 Direct comparison of 1969, 1979 and 1989 censuses in Albania

3.1 a. Comparison of male populations in census dates with the estimated populations.

Age groups	Population in 1969 census	Difference of census and estimated population in 1979 (in %)	Population in 1979 census	Difference of census and estimated population in 1989 (in %)	Population in 1989 census
15-19	104189	0.58	157970	2.49	167368
20-24	80590	-1.72	131680	-2.09	156070
25-29	80123	-1.85	101209	-1.95	153496
30-34	71459	-4.72	76038	-0.13	130079
35-39	58479	-0.06	79151	-0.87	99116
40-44	45237	-1.25	69486	1.82	76328
45-49	40838	-0.26	57152	-1.65	76559
50-54	32131	-5.39	41324	-1.50	66387
55-59	29281	0.91	39081	-1.94	53100
60-64	21654	-2.64	28233	4.07	38492
65-69	17190	-0.56	24215	-6.73	31415
70-74	11765	0.00	15364	-6.36	19080
75-79	7206	2.15	10511	-10.15	12841

3.1 b. Comparison of female populations in census dates with the estimated populations.

Age groups	Population in 1969 census	Difference of census and estimated population in 1979 (in %)	Population in 1979 census	Difference of census and estimated population in 1989 (in %)	Population in 1989 census
15-19	95235	-1.34	144805	1.05	153639
20-24	71569	-2.27	122065	-1.48	146149
25-29	72409	-3.05	91772	0.08	144149
30-34	60579	-5.67	67062	0.08	122053
35-39	51576	-0.04	71738	0.49	91452
40-44	45247	-3.46	57820	3.49	68729
45-49	39857	-1.74	49899	-0.86	70285
50-54	30180	-3.38	42841	0.02	58044
55-59	31998	-0.44	38571	1.82	49420
60-64	24453	-1.25	28346	1.69	41593
65-69	20554	-5.05	28151	-0.99	35538
70-74	14301	6.56	19430	-6.24	23094
75-79	10124	-10.43	14254	-14.79	19052

Table 3.1a and b show the results of the application of this straightforward method. The difference between the population at censuses and the estimated population is shown for both sexes for 1979 and 1989 census populations. The calculations are very simple; for example from the population of 30-34 years old in 1969, the number of deaths occurring during the intercensal period to this cohort are subtracted, obtaining an estimation of the population at ages 40-44 years old in 1979. This estimation for this cohort is then compared with the 'true' number of the enumerated population, age 40-44 years old, at the census of 1979. The age distributions of the populations at the census dates are used, while the number of deaths for the extreme years of the intercensal period (e.g. 1969 and 1979) are adjusted to the census dates.

A careful look of the results of Table 3.1 show that in both the censuses of 1979 and 1989 the under (or over) enumeration of population is relatively small. The results of the estimated population for both sexes in 1979 show that the census population is smaller than the estimated population. This could be a case of either an under-enumeration in 1979 population compared to 1969, or a case of an over-estimation of the population in 1969. It is difficult to judge which one is true, but it is important to mention that these results are consistent with those produced by the application of an indirect method of completeness of one census relative to the previous one in the next section. This deficit of the population in 1979 is present at almost all ages over 20 years old. Another significant feature of the 1979 estimation is that the deficit of the enumerated population at the census is higher for females than males.

While in 1979 the deficit of the population is irregularly distributed at all ages, in 1989 this distribution is mainly concentrated at old ages. This could be a case of improvement of age reporting for people at old ages. In 1989 the male population at the census is under-enumerated, while the female population is over-enumerated as a total. This is probably due to a large under enumeration of females in 1979, and also to an improvement of age reporting.

3.303 Comparing census enumeration by application of an indirect method

Over the last 25 years, several indirect methods have been developed, which estimate the accuracy of the demographic data, either from censuses, sample surveys or civil registration systems. A detailed description of these methods is given in section 3.31 of this chapter, where the completeness of death registration in Albania is estimated. However, an indirect method which evaluates both the completeness at censuses and of the death registration at the same time will be described here.

This method, developed by Hill (Hill, 1987), estimates the completeness of one census relative to the previous one, as well as the completeness of death registration within the intercensal period. This method is a development of Martin's adaptation of 'growth balance method' (Martin, 1980). Martin, by eliminating the stability assumption from Brass' 'growth balance method', wrote the balancing equation based on a variable growth rate r(x+) as follows:

$$N(x)/N(x+) = r(x+) + D(x+)/N(x+) \qquad 3.3$$

Where:

N(x) - Population at exact age x

N(x+) - Population at age x and over

r(x+) - growth rate of the population aged x and over

D(x+) - registered deaths of people aged x and over

Or rewritten in the form of: $N(x)/N(x+) - r(x+) = D(x+)/N(x+)$ 3.4

The two sides of this equation give two ways of calculating the death rates. The right side calculates them by dividing the deaths over age x with the population over age x. The left side calculates them as a difference between the birth rates, calculated as N(x)/N(x+), and the growth rates of the population over age x. Thus, by comparing the two sets of death rates, one can calculate the completeness of death registration. Hill developed this method so that one can also calculate the completeness of one census relative to the previous one. The following formula was developed:

$$N(x)/N(x+) - r(x+) = (1/t)\ln(1/K) + (K^{1/2}/C)[D(x+)/N(x+)] \qquad 3.5$$

Where:

t - is the length of intercensal period

K - completeness of the second census relative to the first one

C - completeness of death registration.

The basis of this formula stands on the fact that N(x), N(x+a) and r(x+) are calculated from the population in two consecutive censuses, and that the populations of the two censuses are respectively k_1 and k_2 complete. Thus, the parameter $K = k_2/k_1$ gives the completeness of the second census relative to the first one, while parameter C gives the completeness of death registration in the intercensal period.

This method was applied to the Albanian data from the censuses and death registration data for the period 1950-1989[2].The censuses checked are the 1950, 1960, 1969, 1979 and 1989 one. It should be mentioned that the two main assumptions implied by this method are that the population is closed to migration and that the coverage factors do not vary with age. The first assumption can be very well applied in Albanian population of this particular period, because as explained in chapter 2 the country was cut off from both West and Eastern Europe, and there were no movements of people in or out of the country. With regard to the second assumption it is very difficult to judge. However, we will assume that the coverage factor does not vary with age.

The estimates of the completeness cover different combinations of age-groups, starting with ages 5, 10, and 15, and ending with 60, 65, and 70.The estimate with the least mean square error is taken as the best estimate of the completeness. The results for the Albanian data are shown in Tables 3.2 and 3.3 as follows:

Table 3.2 Estimates of the completeness of the later census relative to the earlier census in Albania for the period 1950-1990.

Intercensal Period		Male	Female
1950 - 1960	Best Estimate	0.9913	1.0044
	Range	0.9906 - 1.0046	0.9973 - 1.00167
1960 - 1969	Best Estimate	0.9970	1.0209
	Range	0.9941 - 1.0093	1.0151 - 1.0209
1969 - 1979	Best Estimate	0.9960	0.9928
	Range	0.9948 - 1.0013	0.9839 - 0.9949
1979 - 1989	Best Estimate	0.9946	1.0052
	Range	0.9936 - 0.9976	1.0027 - 1.0153

Note: The Best Estimate is the value with the least mean square error.

[2]The calculations were done based on the CENT procedure from MORTPAK-LIFE, a United Nations software package for mortality measurement (United Nations, 1988).

Table 3.3. The relative enumeration completeness in percentage.

Intercensal Period		Male	Female
1950 - 1960	Best Estimate	-0.87%	0.44%
1960 - 1969	Best Estimate	-0.30%	2.09%
1969 - 1979	Best Estimate	-0.40%	-0.72%
1979 - 1989	Best Estimate	-0.54%	0.52%

Looking at the results given in both the tables, it can be said that the relative coverage of the censuses has been relatively complete for the whole period. There is only one exception, the completeness of 1969 relative to 1960 for females, which is relatively high compared with the other estimates. This means that the 1969 census was some 2.09% more completely enumerated than 1960. However, it is clear that there is no trend in the completeness of one census compared to the previous one. In general for male population there is an under-enumeration coverage of one census to the previous for the whole period. While for female population is the opposite, apart for the 1979 compared to 1969 census.

When the results of this method are compared to the results of section 3.302, it is interesting to note that both the methods show similar estimations of census completeness for 1979 and 1989 censuses. Thus, when the 1989 census population is compared with (or derived from) 1979, it is clear that there is an over-enumeration for female population, shown by both the methods. Even when the 1979 population is compared to 1969 for both sexes, an under enumeration is indicated by the two methods. However, for females in 1979, both the methods indicate a larger deficit of population compared to males. There are no obvious reasons that can explain this deficit of female population in 1979. One can only speculate of the possible answers.

From the results of both the methods, it can be concluded that the census enumeration during 1950-1989 is good enough to apply indirect methods for the completeness of death registration.

3.304 Smoothing population age distribution at censuses

When age structure of the population at different censuses was considered in section 3.301 of this chapter, a large age-heaping problem was found, especially for the censuses of 1950, 1960, and to

a lesser degree in 1969. As explained there, this is a common phenomenon for populations where birth registration is weak (as it was in pre-war Albania), and where age distributions are frequently distorted by age misreporting.

Usually it is not recommended that the age distribution of a population be adjusted prior to applying different methods that check the accuracy of enumeration, because the results of the methods applied may be influenced by the 'smoothing' procedure. Because, the completeness of the enumeration of the Albanian population at censuses was established above, here we try to 'smooth' the age distribution of population at the censuses of 1950, 1960 and 1969 for both sexes. However, when the completeness of death registration is checked, both age distributions, the reported and the adjusted, are applied in order to see if there are any differences in the estimated completeness of death registration as a result of the age adjustment.

As mentioned above, the problem found with the data on the first censuses in Albania was a large age heaping problem. That is why in this section a method that reduces the effects of age-heaping is applied to these data. This method, recommended by methodological manuals (UNFPA 1993, 5-31..5-37), is based on the application of successive polynomials to the reported population.

Adjustment methods are usually applied to cumulated age distributions, because the cumulation minimizes the effects coming from a transfer of people from one age to another, especially for the boundary ages.

First, the cumulated populations under ages ending with 3 and 8 are calculated. These ages are chosen because the ages ending with 0 and 5 are more 'attractive' than ages ending with 3 or 8[3]. This was clear when the age heaping for the Albanian population in 1950 and 1960 was considered.

After the cumulation process, two third-degree polynomials are fitted to the two age distributions; one to the cumulated population of ages ending with 3 and one to the cumulated population ending with 8. It is often shown that the ages ending with zero tend to be more 'attractive' than ages ending with 5, thus the cumulated populations under ages ending with 3 will be too large, while the cumulated populations under ages ending with 8 will be too small. For this reason two polynomials

[3]It is important to mention that this is not the case for the later censuses. However, the later censuses were not adjusted for age heaping.

applied and the values of the estimated population under each age are calculated as averages of the values coming from the application of the two polynomials.

Once the best estimates are calculated (as averages of the two values) for the population under ages ending with 0 and 5, the population at each age group can be calculated by successively subtracting the cumulated population estimates; e.g. to provide the population between ages 20-24, the estimated cumulated population under age 20 is subtracted by the estimated cumulated population under age 25.

The details of this method, as well as the details of the results applied to the Albanian population for censuses of 1950, 1960 and 1969 are given in Appendix A. Table 3.4 gives simply the difference between the adjusted population and the reported one by age and sex for these censuses (only for selected age-groups, which were those most affected by the age-heaping).

Table 3.4. The difference between the adjusted and reported populations by age and sex for Albania in 1950 and 1960 censuses.

Age-groups	The difference between the adjusted and the reported populations							
	1950				1960			
	Male	in %	Female	in %	Male	in %	Female	in %
30-34	-121	-0.32	948	2.54	-3501	-6.82	-68.7	-1.44
35-39	-553	-1.60	178	0.54	2696	6.46	1539	3.75
40-44	-400	-1.34	-957	-3.22	-151	-0.41	880	2.46
45-49	1249	4.97	2509	9.66	-783	-2.41	-66	-0.21
50-54	-1491	-7.08	-1719	-7.65	-207	-0.76	-997	-3.54
55-59	2631	14.85	1503	7.63	1223	5.56	2727	11.24
60-64	-1247	-8.22	-1397	-8.05	-1042	-5.91	-2026	-9.93
65-69	-333	-2.66	-721	-5.01	1258	9.01	742	4.44
70-74	-398	-4.46	-545	-5.31	-769	-7.19	-1003	-7.60

Note: The young age-groups are not considered because there was no age-heaping in those groups. Later age-groups (75-79, and 80 and over) are not included because the method does not adjust them.

The negative values indicate a larger reported population compared with the adjusted population in the age-groups. If one looks at the 1950 values, it is clear that the main redistribution of the population is within age-groups that have the highest age-heaping problem. This is true for both sexes and also for the 1960s values. Another significant point that one can draw is that in the 1960s values, the concentration of redistribution of population starts two age-groups later compared to 1950. This

is understandable because this method eliminates the effect of age-heaping, which also moves up with ages (in this case 10 years).

The last point to make here is that in 1960 there is a large redistribution between ages 30-34 and 35-39 for males. From a careful look of the age-structure of the population in figure 3.1, it is clear that there is a gap in the male population at ages 35-39 (the cohort born in 1920-25) and a heap at ages 30-34. That is why we have a larger adjusted population for the age-group 35-39 (a positive value in the table), and a smaller one for the age-group 30-34 (a negative value in the table). A similar effect happens with the age-groups 55-59 and 60-64. This could probably be explained with the fact that these two cohorts (born in 1895 and 1900) were between 20-30 years old during the World War I, and consequently the ones most affected by the War.

3.305 Concluding notes on the quality of census data

Section 3.30 has looked at the quality of census data by applying different methods, direct and indirect ones, in order to check the census enumeration. Overall, one can say that the quality of the census data is surprisingly high, compared with the level of development in the country during the period.

The completeness of census enumeration is high. This was shown from the results of the application of the Hill's method, which were generally good, with an exception in the 1960-1969 coverage for the female population, which was relatively poor.

The first two censuses considered here, in 1950 and 1960, had a large age-heaping problem which started from early adult ages. This problem was partially eliminated by the application of a 'smoothing' polynomial method. One other point to be emphasised is that the age reporting is more problematic for women than men in the early censuses.

A particular problem related to the Albanian data is the age-heaping in 1969 census, where the 'attractive' ages were not as usual, the ages ending with 0 and 5, but ages ending with 3 and 8. However, because the age-heaping problem in this census was lower compared to 1960 and 1950 censuses, when population by five years age-groups is calculated, the effects of this particular heaping are minimised. The smoothing procedure is also applied for the age distribution of the population in this census.

Concluding this section, it can be said that the census enumeration is good enough to apply different methods to check the completeness of death registration. Even more valuably, it is good enough to build the life tables for the whole period, so that a complete analysis of the mortality trends and patterns can be undertaken.

3.31 Completeness of death registration

3.311 Introduction to methodology

One of the goals of this chapters is to check the quality of mortality data. The previous section concluded that the quality of census enumeration was good enough to apply different indirect methods to check the completeness of death registration. This level of census enumeration allows the application of several methods that check the quality of mortality data. This section describes some of these methods, which are applied to the Albanian data.

Over the last 30 years scholars have developed a large number of indirect methods that check the quality of death registration. Most of the work done on this subject is based on the fact that in a closed population there is a relationship between the population's age-structure and time, the age-specific force of mortality function and time, and also between the age-specific growth rates and time (Preston and Coale, 1982, p. 217). Based on the mathematics of these relationships in a population, and also on the universal assumption of 'a closed population', different approaches have been developed.

One of those methods, developed by Hill in 1987, was introduced in Section 3.303. This method checks the accuracy of the death registration based on the relative completeness of census enumeration. This is a common characteristic that applies to all these methods. Apart from this common characteristic, all these methods are based on the following assumptions: that the population studied is closed to migration, the age reporting of deaths and births is accurate, and (in most of the cases) the completeness of death registration is constant over age.

These are common assumptions and characteristics that apply to all these methods. However, the methods differ from each other in the extent to which they develop and apply these assumptions and others.

One of the first methods introduced to check the completeness of death registration was 'the growth

balance method' developed by Brass in 1975 (UN 1983). This method, which holds only with an assumption of stability in a population, is based on the following equation:

$$N(x)/N(x+) = r + k[D(x+)/N(x+)] \qquad 3.6$$

Where:

N(x) - Population at exact age x

N(x+) - Population at age x and over

D(x+) - registered deaths of people aged x and over

r - growth rate of the stable population

k - the inverse of the completeness of death registration.

As explained in section 3.303 both sides of this equation give two ways of calculating death rates in a closed population. By comparing them one can calculate the completeness coefficient C = 1/k.

Later on Martin (Martin, 1980) developed this equation further by eliminating the stability assumption, and introducing a variable growth rate with age.

$$N(x)/N(x+) = r(x+) + k(x)[D(x+)/N(x+)] \qquad 3.7$$

Where r(x+) is the growth rate of the population over age x, and k(x) is the inverse completeness of death registration at age x.

A different approach to checking the completeness of death registration was introduced by Preston and colleagues in 1980 (Preston and Hill 1980, Preston et al, 1980). This method is based on the fact that the age distribution of a population can be estimated from the age distribution of deaths. Thus, the completeness of death registration is calculated by the ratio of the estimated population to the observed population. The mathematics of this method are briefly given as follows:

$$N(a) = {}_a\int^{\infty} D^*(x)\exp[r(x-a)]dx \qquad 3.8$$

where:

N(a) - The population at age a

D*(a) - The true number of deaths

D*(x)exp[r(x-a)] - an estimate of the number of people currently age a who will die at age x.

This relation, given by equation 3.8, is always true in a stable population.

As previously defined the completeness of death registration will be given by the ratio of the registered deaths and the true deaths:

$$k = D^*(x)/D(x) \qquad 3.9$$

where: D(x) - is the registered number of deaths, while k, as previously defined is the inverse of completeness.

Thus, if one writes the formulae 3.8 for the observed population, the following equation can be obtained:

$$N^\circ(a) = {}_a\int^\infty D(x)\exp[r(x-a)]dx \qquad 3.10$$

The formulas 3.8 and 3.10 differ from each other only because of the different number of deaths they use. Thus, the completeness of death registration can be obtained by the ratio of the estimated and the observed populations ($N^\circ(a)/N(a)$).

This method, similar to Brass' growth balance method also assumes the stability of the studied population. In 1981 Neil Bennett and Shiro Horiuchi (Bennett and Horiuchi, 1981) further developed this method by eliminating the assumption of stability in the calculation of the population at age a ($N^\circ(a)$).

Thus, when Preston and his colleagues introduced this method, they calculated the estimated population at age-group (a-5) by the formulae:

$$N^\circ(a-5) = N^\circ(a)\exp[5r] + {}_5D_{a-5}\exp[2.5r] \qquad 3.11$$

where r is constant with age. Bennett and Horiuchi rewrote this formulae for a 'destabilised' population by introducing a variable r with age a.

$$N^\circ(a-5) = N^\circ(a)\exp[5\,{}_5r_{a-5}] + {}_5D_{a-5}\exp[2.5\,{}_5r_{a-5}] \qquad 3.12$$

where ${}_5r_{a-5}$ is the growth rate experienced by those in the age group a-5 to a.

Another different approach from the above methods was introduced by Preston and his colleagues in 1980 (Preston and Hill 1980). This method, which was first elaborated by Brass in 1979, is based on intercensal cohort survival analysis. The particular merit of this method is that, it does not just estimate the completeness of death registration, but also the relative coverage of enumeration between two censuses. The method was based on the following formulae:

$$P_1(y)/P_2(y) = (c_1/c_2) + c_1k[D(y)P_2(y)] \qquad 3.13$$

where:

$P_1(y)$ and $P_2(y)$- are the populations of a cohort (y) at the first and the second census.

c_1 and c_2 - are the completeness of enumeration at the first and second censuses.

D(y) - are the deaths of cohort y during the intercensal period, while

k - is the inverse of the completeness of death registration.

This method was found to be very unstable in practice because the cohort of deaths obtained from the two age distributions were seriously distorted by age misreporting errors (Hill 1987, p. 9). This becomes more serious as age increases, because the exaggeration of age increases with age. Thus, Hill in 1987 based on this idea and on the Martin's modification of the growth balance method developed a method which is explained in details in section 3.303, and which is generalised by the formulae 3.5.

A careful observation of all the methods shows that they were first developed to be applied to a stable population and then modified to eliminate this assumption of stability. The application of these methods depends on the choice of the individual researcher, the type of data available and on the plausibility of the assumptions to the population under study.

3.312 Applications and results from Albanian death registration data.

When the death registration data in Albania were checked for their accuracy, a number of different factors were considered. As previously mentioned, Albania was completely isolated from the outside world for the period under consideration. This implies that the general assumption on a closed population to migration, can very well be applied to the Albanian case. Apart from that, it was also shown that the census enumeration in Albania was relatively complete and good enough to apply different methods which check the quality of death registration.

These two important characteristics of the Albanian data create the possibility of having a choice in the application of the methods described in 3.311.

The logic followed when these methods were applied, is similar to the one that was followed when they were developed. First, a method which assumes stability was applied and later two other methods that do not assume it. The growth balance method, Bennett-Horiuchi approach and the Hill method (1987), which was applied earlier in section 3.303, were chosen. The Bennett-Horiuchi and Hill methods were chosen because they represent two different approaches to checking the quality of death registration data.

Table 3.5. Completeness of death registration calculated on the basis of different indirect methods. Albania 1950-1989.

Intercensal period	Methods used	Completeness of death registration	
		Males	Females
1950 - 1960	GBM[4]	0.868	0.754
	B-H 1	0.915	0.904
	B-H 2	0.922	0.784
1960 - 1969	GBM	0.945	0.836
	B-H 1	0.918	0.843
	B-H 2	0.893	0.843
1969 - 1979	GBM	0.965	0.854
	B-H 1	1.103	0.984
	B-H 2	1.103	0.970
	CENT[5]	1.114	1.000
1979 - 1989	GBM	0.982	0.977
	B-H 1	0.975	0.975
	B-H 2	0.975	0.975
	CENT	0.992	0.975

Note: GBM stands for the growth balance method, B-H 1 stands for Bennett-Horiuchi method, B-H 2 stands for the for Bennett-Horiuchi method when the smoothed age distributions were applied instead of the observed age distributions at censuses. While CENT stands for the Hill method of 1987.

[4]The values for the growth balance method are averages of the two values at the beginning and end of the intercensal period.

[5]Hill method is applied only in the last two intercensal periods, where the age reporting is better than the previous periods.

It is also important to mention that Bennett-Horiuchi method is applied twice, first with the observed data on age distribution from censuses, and second in some of the census years the 'smoothed' age distributions of the populations were applied. The intercensal deaths by age groups were available for the whole period under study, 1950-1989 in the General State Archive and in the Archive of the Institute of Statistics in Albania. The results from the application of these methods are given in Table 3.5. The calculations of the Bennett-Horiuchi and Hill methods were obtained by using the MORTPAK package (United Nations, 1988), where respectively the BENHR and CENT programs were used.

Taking the average values of all the methods, and the best estimate of the CENT method, the values given in Table 3.6 show the completeness of death registration in Albania from 1950 to 1989.

Table 3.6 Average completeness of death registration in Albania, 1950-1989.

Intercensal Period	Method used	Average completeness of death registration	
		Males	Females
1950 - 1960	Best Estimate	0.895	0.769
1960 - 1969		0.919	0.840
1969 - 1979		0.998	0.910
1979 - 1989		0.983	0.975

Looking at the results of the 1969 - 1979 period, especially males, the results are higher and 'out of line' compared to the estimates of other periods. It is interesting to note that both the methods, CENT and B-H show the same increase in this period. It is known that both methods are extremely sensitive to census enumeration, especially in the older age-groups. When the census enumeration for the 1969-1979 period was checked, a relatively large under-enumeration was found in 1969. It is probable that this under-enumeration has caused this high estimated completeness of death registration in 1969-1979 period in Albania.

Apart from this observation, the results for other periods show a consistent improvement of death registration completeness. This improvement has occurred for both sexes, but is more significant for females then males. This is understandable because the completeness for males was higher than for females from the beginning in 1950-1960.

The sex differentials in completeness have always been there and have continued up to the end of the eighties. However, the sex differences have narrowed with time, and in the last period under consideration, this difference is minimal, and can be considered insignificant. One can expect this sex difference, because this was also found when the age reporting in the censuses was considered in section 3.301 of this chapter. As explained there, this sex differential is related to the state of the Albanian society immediately after World War II, when women were still disadvantaged in society, and the rate of female illiteracy was very high.

Table 3.5 also shows that, although the values obtained by the application of three methods differ slightly from each other, they still show the same pattern of change; e.g. the high value of completeness of death registration for males in 1969 - 1979 period is shown by all methods; also the male-female difference is shown by the three methods.

When the completeness of death registration is considered for Albania, the most problematic period is 1950-1960, when the completeness of death registration was relatively low, especially for females at 75.4%. The other periods show a high completeness of death registration, especially in the last period 1979-1989, when the completeness goes up to 98.3% for males and 97.5% for females.

Before mortality trends and patterns are analysed in chapter 4, it is important that the number of registered deaths should first be adjusted. Based on the values calculated in Table 3.6, we can interpolate for the four intercensal periods and obtain the estimated values of completeness of death registration which are given in Table 3.7

Table 3.7 The estimated completeness of death registration. Albania 1950-1989.

Years	Estimated Completeness of Death Registration	
	Males	Females
1950	0.874	0.736
1955	0.890	0.768
1960	0.908	0.804
1965	0.924	0.839
1969	0.939	0.872
1975	0.955	0.906
1979	0.969	0.939
1985	0.983	0.975
1989	0.983	0.975

When these coefficients of omission of death registration are applied in the mortality analysis, it will be assumed that this omission is the same for all ages. The only age for which the completeness of death registration is available independently is age under 1 year old - the deaths of infants. This is done because the most problematic age for the completeness of death registration in some East European countries during the same period of study is found to be the age 0-1 (Jones and Grupp 1983, p. 219, 22, 23).

3.313 The quality of infant mortality data.

Given its socio-economic situation, the Albanian vital registration system has been found to produce good quality data with regard to death registration, and a relatively low omission of deaths was found. In the eighties this omission of deaths for people one year old and over was found to be less than 2% for males, and 2.5% for females. The birth registration was also found to be very accurate (INSTAT, 1996).

The health of new born children in Albania was very strictly monitored, as there was a government policy aimed at the reduction of infant and maternal mortality. It is important to point out here that the doctor of the district was responsible for the health of infants in his/her area, and his/her performance was measured by the rate of infant mortality.

H. van der Pol (van der Pol, 1993) checked the accuracy of infant mortality data in Albania. He calculated infant mortality rates based on the data from civil registration and censuses (the child survivorship method). A large difference was found in infant mortality rates calculated with data from the two sources. This difference could come about either as a possible transfer of reported deaths from age 0 to age 1, and a consequently increased child mortality rate (mortality in age group 1-4), or a possible omission in the registration of infant deaths.

It was concluded that the difference in infant mortality rates between the two methods did not arise as a result of a transfer of deaths, but because there was an omission of very young infant deaths in the vital registration. Van der Pol produced a number of completeness coefficients for the registration of infant mortality, which are given in Table 3.8 and will be used in the analysis of mortality later on in chapter 4.

Table 3.8 Adjustment coefficients for the registered number of infant deaths in Albania. 1950-1989.

Years	Adjustment Coefficients of Infant Deaths	
	Males	Females
1960	1.213	1.216
1965	1.100	1.150
1970	1.150	1.200
1975	1.200	1.250
1980	1.250	1.300
1985	1.500	1.550
1989	1.498	1.573

Source: INSTAT (1996) Projections of Albanian Population 1995 - 2000, p. 26

It is interesting to note that in the eighties the omission of infant deaths is higher than in the sixties, the opposite of what was expected. As was previously noted, the performance of the district doctors during the communist period in Albania was measured by the rate of infant mortality. This became most significant in the eighties, when the health system, as almost all aspects of economic and social system of Albanian society were deteriorating. It is believed that a large number of infant deaths were either not reported, or registered as over one year old deaths in this period. However, no new data are available to update or revise Van der Pol's estimation on infant deaths. In such circumstances, his estimates of infant death completeness will be used.

3.314. Concluding notes on the quality of death registration data.

The results of section 3.312 show that the vital registration system in Albania produced good quality mortality data. The completeness of death registration was found to be high, especially in the last period under consideration, 1979-1989. In this period the omission of deaths was less than 2% for males and 2.5% for females.

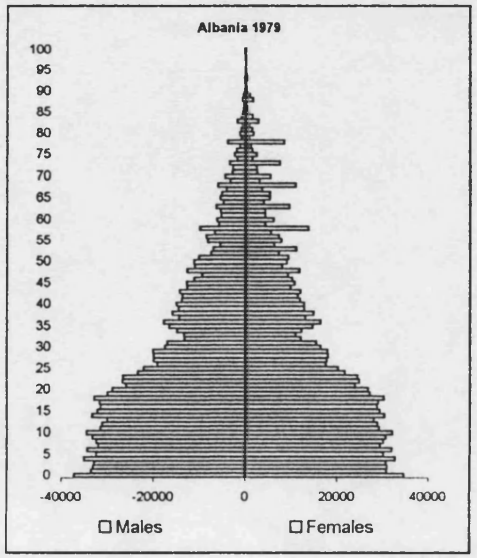
The completeness of death registration has changed over time. This change has been a gradual improvement for both sexes since 1950. The only period when the estimated completeness of death registration does not follow the pattern of change is 1969-1979, especially for males. It was explained that this excess of completeness was due to the under-enumeration of higher age groups in the census of 1969.

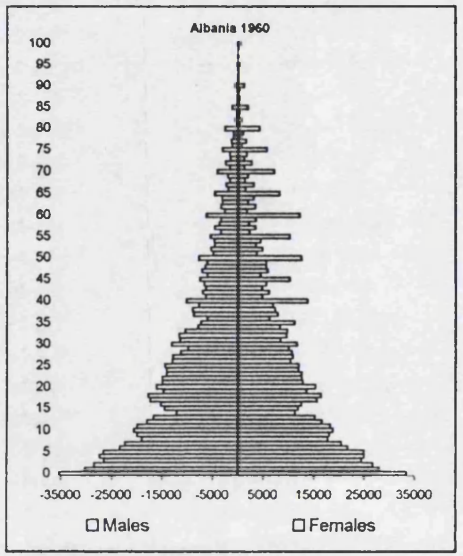
There is a sex difference in completeness of death registration, with males having higher completeness compared to females during the whole period 1950-1989. These sex differentials were reduced and in 1979-1989 they were almost insignificant.

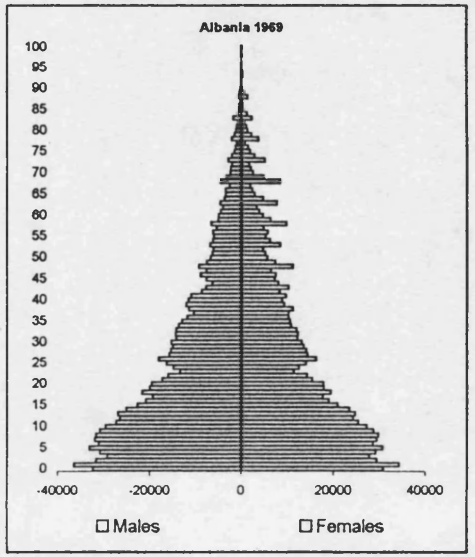
With regard to infant death registration, other scholars have found a relatively high omission of infant deaths mainly at the very young ages of infancy. It is interesting to note that in contrast to the completeness of death registration for ages over 1 year old, the values of completeness for infant deaths are worse in the last period under consideration, 1979-1989, than in the beginning. It is believed that the figures on infant deaths in the last period were intentionally manipulated to show a continuous improvement of infant mortality. No other factor can better explain this decrease in the completeness of death registration for infants.

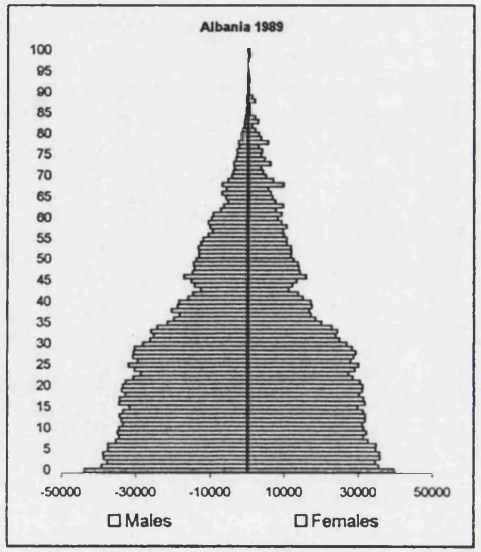
However, overall it can be said that the completeness of death registration in Albania is high, and the data are reliable to analysis the mortality trends and pattern since 1950. The mortality indicators will be calculated based on the corrected figures with the coefficients of completeness of death registration.

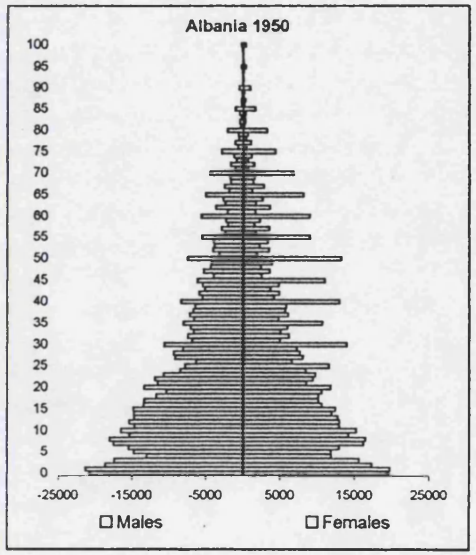
Figure 3.1. Population Pyramids - Albania (1950-1989)











Chapter 4. GENERAL TRENDS AND PATTERNS OF MORTALITY, 1950-1990

4.1 INTRODUCTION.

Chapter 3 described the quality and availability of mortality data in pre- and post-World War II Albania. With reference to pre-War availability of data, it was concluded that the data were sporadically collected and were available for only a few years. Their quality was poor and the first published data on mortality cover just a few years before WWII. Crude death rates first become available in 1930, with data available for 1932 and 1936. Although the availability and quality of pre-War mortality data in Albania leave a lot to be desired, they are still worth considering when long term trends of mortality are analysed.

In contrast, when the quality of mortality statistics after WWII was considered, it was concluded that the completeness of death registration was good as was the enumeration coverage in censuses. The data were available for the whole period, 1950-1990, collected on regular basis from censuses and vital registration system. The mortality data used in this chapter are corrected with the completeness coefficients produced in chapter 3 for both mortality over age 1 year old, and mortality of infants. On this basis life tables for the whole period were developed. Based on the functions of these life tables the analysis of mortality trends and patterns of the whole period under consideration is carried out in this chapter.

Although, the focus of this chapter are the mortality trends and pattern during 1950-1990, still a few words are necessary to describe the situation in pre-War Albania with reference to mortality.

Turkish rule, which ended with the independence of Albania in 1912, left the country in such medieval conditions that the people were subject to numerous common diseases, but with no means to fight against them. The country had a reputation of being malarious and with widespread tuberculosis. The experience of different European armies during the First World War, 1914-1918, proved that the country's reputation for being unhealthy was entirely justified (Mason et al, 1945, p. 119). The data to confirm this situation came later, in the 1920s and 1930s, when health institutions in the country were created and more research was carried out to collect health and mortality statistics.

The first data on the widespread malaria in Albania came from research carried out by Dr. W. E.

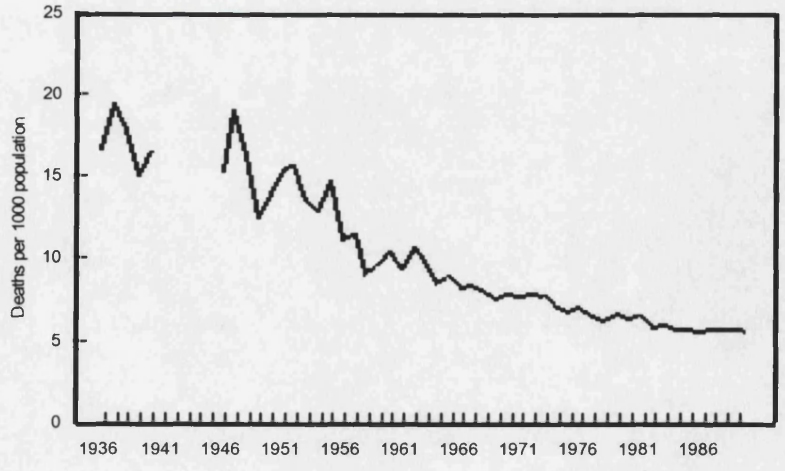
Haigh in 1925, as part of a report for the League of Nations Health Organisation (Haigh, 1925). As was expected, malaria and tuberculosis were the most serious endemic diseases prevalent in the country. A large number of infectious diseases were also prevalent, although not endemic, such as smallpox and typhus fever, among others. More details on the prevalence of these diseases are given in chapter 5, where cause-specific mortality in Albania is considered.

If the crude death rates are considered, in 1930 (the first available statistics) Albania had a CDR of 16.3 deaths per thousand population. This value was lower than Romania (19.4), Portugal (17.1), Yugoslavia (19.0) and Spain (16.9). While in 1938 and 1939 Albania had a rate of 17.8 and 15.1 deaths per thousand respectively. These recorded rates were similar to a number of high-mortality European countries in that period. Thus, for example, apart from Romania (with a CDR of 19.4) and Spain (with a CDR of 19.2) in 1938, Albania had the highest value of CDR in Europe. While in 1939, the rates were comparable to those of other European countries, such as Yugoslavia (15.0 per thousand), Austria (15.3 per thousand), or Portugal (15.3 per thousand) (Mitchell, 1978, p. 114-33).

The absence of information regarding the age and sex distribution of deaths, cause-specific mortality data, etc. makes the further analysis of mortality pattern in pre-War Albania difficult.

If the crude death rates are plotted for the whole period that data are available - 1936-1990, one can easily see how the overall mortality trend has come down in Albania through time (Figure 4.1).

Figure 4.1 Crude death rate, Albania 1938 - 1990.



It is clear that the mortality has improved with time since the end of World War II in Albania, since age structural changes could not account for this improvement. Thus, in 1946, the first mortality record in post War Albania, the crude death rate was 15.3 per thousand, similar to that in 1939. By 1950 it had fallen to 14.0 deaths per thousand, but the largest

improvement in mortality occurs in the period 1950-1960, when the rate fell from 14.0 per thousand in 1950 to 10.4 per thousand in 1960. In later periods the improvement is gradual, and in 1990 the crude death rate of 5.6 deaths per thousand people shows a very low mortality rate in Albania, similar to mortality rates of other European countries.

4.2 MORTALITY TRENDS IN POST WORLD WAR II ALBANIA

As previously mentioned this analysis is based on life tables calculated for the whole period 1950-1990, based on the statistics available in published books, or collected from Institute of Statistics Archive and the General State Archive. The full life tables for the period 1950-1990 are given in Appendix B. The mortality rates in these tables are corrected with completeness coefficients calculated in chapter 3 for ages over 1 year and for age 0-1.

The life tables were first developed for the census years, using the same age distributions of the population as provided from the censuses. Thus, the life tables for 1950, 1960, 1969, 1979, and 1989 were first produced, and later on the life tables for mid period years of 1954-55, 1964-65, 1975-76 and 1984-85. Some of the indicators of those life tables are shown in Table 4.1.

Life expectancy at birth (e_0) is taken as an indicator of overall mortality; the probability of dying at age 0-1 ($_1q_0$), and between ages 1-5 ($_4q_1$), as indicators of respectively infant and child mortality; the probability of dying at ages 15-60 ($_{45}q_{15}$) and life expectancy at age 15 (e_{15}) as indicators of adult mortality. The two last indicators are selected to see how much the adult mortality changes as result of old age mortality (e_{15} includes the mortality at old age, over 60, while $_{45}q_{15}$ does not include it). The life expectancy at age 60 (e_{60}) is taken as an indicator of mortality at old ages.

Looking at Table 4.1, which gives the mortality indicators for both sexes combined and separately, it is clear that the period 1950-1990 was significant in terms of mortality improvement in Albania. Life expectancy at birth increased by 19.1 years for both sexes, in a relatively short period of 40 years. The larger improvement was for female mortality, where life expectancy at birth increased by 22.79 years, while male life expectancy at birth rose by 16.63 years. This trend is clear in Figures 4.2 and 4.3, where the mortality indicators are plotted in two graphs. Both the figures indicate an increase of e_0 for both sexes during the whole period, but while this increase has gradually continued for females, for males the pace of improvements slowed down in sixties and eighties.

Table 4.1 Mortality indicators, Albania 1950-1989

4.1 a Male & female

Years	e_0	$_1q_0$	$_4q_1$	$_{45}q_{15}$	e_{15}	e_{60}
1950	51.6	143.1	105.3	27.1	53.9	19.1
1954-55	55.0	103.9	124.3	23.1	56.3	19.4
1960	62.0	96.6	58.6	16.4	58.6	19.0
1964-65	64.1	92.9	34.2	15.3	58.6	18.4
1969	66.5	89.1	22.2	13.7	60.1	19.5
1975-76	67.0	84.8	18.9	11.5	60.0	18.5
1979	68.0	74.1	17.4	11.5	60.1	18.6
1989	70.7	45.4	15.5	10.2	60.6	18.8

4.1 b Male

Years	e_0	$_1q_0$	$_4q_1$	$_{45}q_{15}$	e_{15}	e_{60}
1950	51.9	142.2	90.7	29.2	52.9	18.4
1954-55	54.1	101.9	129.5	24.4	55.3	18.3
1960	61.7	92.0	49.6	18.9	57.2	18.0
1964-65	63.4	87.9	28.8	18.0	57.0	17.3
1969	64.6	88.4	20.2	17.3	57.8	17.9
1975-76	64.6	84.4	17.9	14.3	57.2	16.2
1979	65.6	73.2	16.8	14.9	57.4	16.7
1989	67.9	47.0	15.4	13.1	57.8	16.5

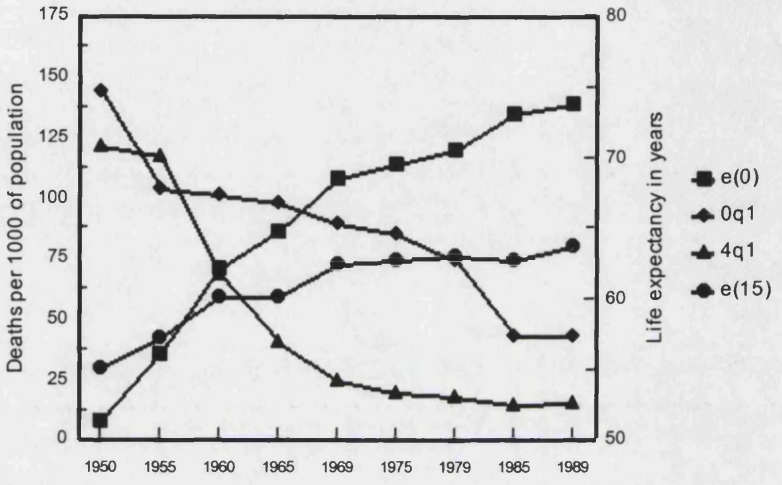
4.1 c Female

Years	e_0	$_1q_0$	$_4q_1$	$_{45}q_{15}$	e_{15}	e_{60}
1950	51.3	144.0	121.7	24.8	55.1	20.0
1954-55	56.1	103.7	117.0	21.7	57.2	20.3
1960	62.2	101.3	68.6	13.6	60.1	19.8
1964-65	64.7	98.2	40.3	12.3	60.2	19.3
1969	68.5	89.8	24.5	10.0	62.5	21.0
1975-76	69.5	85.1	20.0	8.4	62.8	20.6
1979	70.6	74.8	18.0	7.7	63.0	20.6
1989	73.9	43.4	15.6	6.9	63.7	21.1

Most of the improvement in life expectancy at birth occurred in the first decade, when life expectancy at birth increased by 10.4 years for both sexes, more than one year for each year of the decade. Again the improvement is higher for females then males (10.9 years for females and 9.8 years for males). The increase of e_0 during 1950-1960 is 54.5 % of the total increase for the whole period 1950-1990. The reasons for this major improvement within a decade will become clear when the cause-specific mortality is considered in chapter 5. Anticipating a little, we can note that during

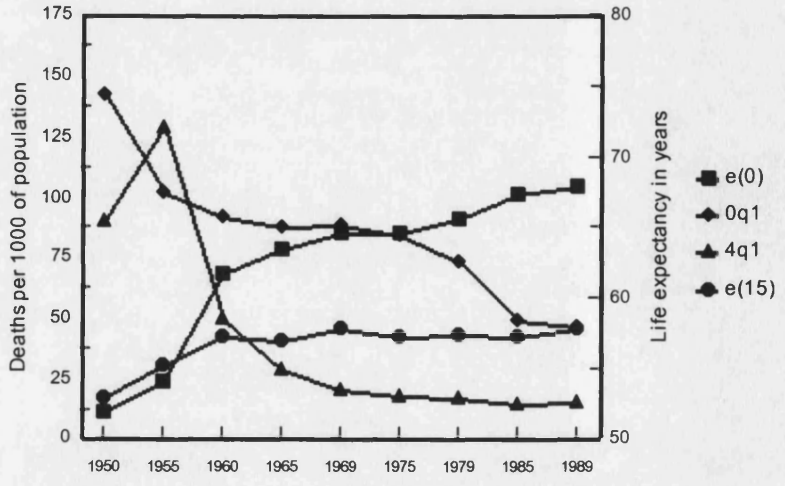
this period there was a large reduction of mortality rates at all ages from infectious and parasitic diseases, which were main killers in pre-War Albania.

Figure 4.2 Female mortality in Albania, 1950-1989



In the next three decades mortality continued to improve, although not at the same pace as in the first decade. 1960-1969 shows an increase of e_0 by 4.5 years, while in the other decades the improvement is very slow, especially for males. Thus, from 1969 to 1989 for males life expectancy at birth improves by 3.3 years, and for females by 5.4 years. This is not a major improvement compared to the first two decades, but it is still significant, and moreover it is a steady one. This becomes more significant when compared to the experiences of other East European countries during the eighties, which saw an increase in mortality especially among the adults, as for example in Russia, where life expectancy fell below 70 years in 1990 (Shkolnikov et al, 1995, p. 908).

Figure 4.3 Male mortality in Albania, 1950-1989



Another distinctive point which emerges when looking at the values of life expectancy at birth in Albania, is the fact that in the 1950s both sexes had similar values of e_0, males with 51.9 years and females with 51.3. This experience is very

different from other European countries in that period, even countries that had the same level of life expectancy at birth. A female life expectancy at birth of at least 4 years more than males should have been expected. Surprisingly, this disadvantaged situation for females is also present in the Yugoslav region of Kosova, which is almost entirely populated by ethnic Albanians. In 1950 life expectancy at birth for females was 52.0 against 51.9 for males, while in the sixties the male e_0 was actually higher than for females, 57.0 versus 55.8. This similarity of e_0 for males and females is strongly influenced by the infant and child mortality values at the time, which show the same pattern. The reasons for that are explained later in this chapter. In the following years the female mortality started improving more rapidly than male mortality, and by 1989 the difference between female and male life expectancy at birth was exactly 6.0 years, with female e_0 reaching 73.9 years, while male e_0 was 67.9 years.

Table 4.1 and Figures 4.2 and 4.3 show clearly that the two components of mortality that have experienced the major improvements are infant and child mortality, measured respectively by probability of dying at ages 0-1 and 1-4, ${}_1q_0$ and ${}_4q_1$. Infant and child mortality in post-World War II Albania were very high. Infant mortality was 143.1 deaths per thousand and child mortality 105.3. Both infant and child mortality in 1950s were high in comparison to other neighbouring countries. Thus, Bulgaria and Yugoslavia had respectively a ${}_1q_0$ of 82 (in 1953) and 115 (in 1950) deaths per thousand; and a ${}_4q_1$ of 22 (in 1953) and 43 (in 1950). Albania with values of 143.1 for ${}_1q_0$ and 105.3 for ${}_4q_1$ had a much worse situation of infant and child mortality than either of these two neighbours.

It is also significant that both infant and child mortality were higher for females than males in the first two decades, 1950-1969. Thus, in 1950 infant mortality was 144 deaths per thousand for females and 142 for males, while child mortality was 122 per thousand for females and 90 per thousand for males. It is precisely this sex difference in infant and child mortality in the fifties that causes the difference in life expectancy at birth in 1950. This sex difference is understandable given the nature of traditional Albanian society, where male infants and children in rural areas were markedly advantaged relative to females in terms of care and nutrition. There is also evidence that this sex-specific pattern for infant and child mortality is present also among Albanians in Kosova. This suggests again the existence and influence of traditional traits on the mortality patterns in Albania. These differentials are also found in some other traditional societies. Thus, Das Gupta found these sex differences in Rural Punjab, India, where child female mortality after the neonatal period was higher then child male mortality. She concludes in her article that this was mainly due to malnutrition among female children (M. Das Gupta, 1987, p. 95). In later decades this sex difference in infant

and child mortality becomes narrower and especially in the last decade under consideration, 1979-1989 when a higher infant mortality for males is observed.

As with life expectancy at birth, the major improvement in infant and child mortality happened during the first decade, where infant mortality reduced by 46.5 deaths per thousand, and child mortality by 46.7 per thousand. Infant mortality remained high until 1979, where a high value is recorded of about 74.1 deaths per thousand. The last decade, 1979-1989, is also significant because infant mortality reduced by 28.7 deaths to thousand births. In contrast, child mortality improvement followed a more gradual pattern. After a major reduction in the first decade, the improvement in other decades is relatively small.

Looking at the values of ${}_4q_1$, the 1954-55 value stands out. Instead of going down as expected, child mortality went up by 19 deaths per thousand. This is unusual and cannot be explained within the mortality determinants at the time considered, or with the cause-specific mortality pattern. One factor that might be responsible for this upswing in child mortality is a distortion of population data that were estimated based on the census data of 1950. However, no definite explanation is available.

Although, the improvements in infant and child mortality are dramatic during the period 1950-1989, respectively by 97.7 deaths per thousand and 89.8 per thousand, the level of both indicators is still much higher compared not just with the standards of West European countries, but also with the countries of Central and Eastern Europe.

To measure adult mortality the values of the probability of dying between ages 15 and 60 (${}_{45}q_{15}$) were chosen as well as values of life expectancy at age 15 (e_{15}). In a similar way to infant and child mortality, adult mortality improved dramatically during the first decade. Thus, the ${}_{45}q_{15}$ improves from 27.1 to 16.4 deaths per thousand during 1950-1960, or if e_{15} is considered it improves by 4.7 years. After 1960, the two indicators show a different pattern. Thus, ${}_{45}q_{15}$ shows a slow, but gradual improvement from 1960 to 1989, while e_{15} after another change in 1960-1969, shows no change at all in the last two decades, 1969-1989. This is because e_{15} takes into account the mortality of the elderly.

In contrast with sex differentials in infant and child mortality, adult mortality for females has throughout been lower than male mortality. Thus, in 1950 ${}_{45}q_{15}$ was 29.2 deaths per thousand for males, but 24.8 for females. This difference continues for the whole period and at the end of the

period in 1989, ${}_{45}q_{15}$ is 13.1 per thousand for males and 6.9 for females.

There are two noteworthy points related to trends in adult mortality during the 1950-1989. First, as mentioned above, adult mortality improves rapidly within the first decade 1950-1960, and after this period the improvement is marginal and very gradual. The second point is that in contrast to the very high values of infant and child mortality during the whole period, adult mortality is very low in Albania, especially in 1989, compared not just to Eastern European countries, but also to the more developed and advanced countries of Western Europe. Although, both of these issues will be dealt in detail in chapters 5 and 7, when cause-specific mortality, and international comparisons will be analysed, it is still important to mention that after disappearance of infectious and parasitic diseases in the 1950s, the cause-specific adult mortality pattern in Albania is similar to that of more developed Southern European countries such as Italy, Spain and Greece.

While adult mortality did not change much after 1960, mortality at old ages did not appear to change at all. The values of life expectancy at age 60 do not show any noticeable change. Despite the fact that the values of e_{60} do not show much change, this does not mean that the mortality at old ages did not improve during 1950-1990. A careful look at the values of Table 4.1b and c shows that the issue is more related to the experiences of women than men. Male e_{60} shows an improving trend, while the female one does not indicate any improvement of old age mortality. One of the reasons that might hide an improvement for females could be the improvement of age reporting for old ages in the censuses in Albania. As described in chapter 3, age reporting for females was more problematic than males in the first censuses, and age reporting improved with time.

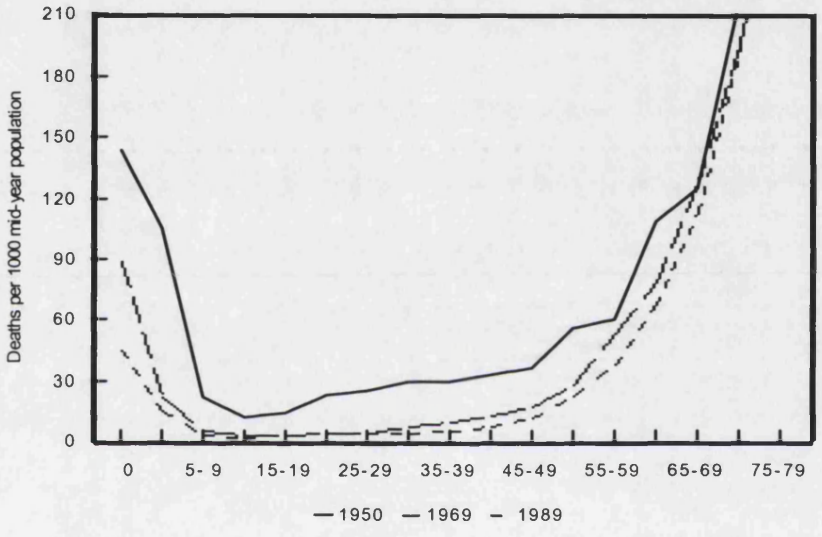
4.3 AGE PATTERN OF MORTALITY IN ALBANIA, 1950-1989

In order to see the changes in mortality pattern in Albania during 1950-1989 the ${}_nq_x$ values are plotted against age in Figure 4.4. Three years are chosen - 1950 as the beginning of the period under study, 1969 as a mid period value and 1989 as the last year of period.

The first distinctive point that attracts attention in the graph is the fact that from 1950 to 1969 mortality was reduced at all ages up to age 65. While mortality of ages up to 65 has improved dramatically, mortality over 65 has not changed much during the period. As described in the previous section, this could be a case of improved age reporting at old ages and should be treated with some reserves.

It is clear that in all the three years considered here Albania represents an extreme case of mortality pattern with very high infant and child mortality and low adult mortality. In 1950, although infant and child mortality were very high, respectively 143.1 and 105.3 deaths per thousand, adult mortality was relatively low ($_{45}q_{15}$ was 27.1 per thousand). From 1950 to 1969, in addition to the reduction of infant and child mortality, adult mortality fell from 27.1 to 13.7 per thousand. While infant and child mortality continued to improve from 1969 to 1989, adult mortality improved only marginally, and only over age of 30. Thus, from 1969 to 1989, $_{45}q_{15}$ fell from 13.7 to 10.2 per thousand.

Figure 4.4 q_x values for different years during 1950-1989.



As described in the previous section mortality has improved dramatically in Albania so that our best estimate is that life expectancy at birth has improved by almost 20 years in a period of 40 years. Mortality has improved at all ages, but with the most dramatic reduction in infant and child mortality. In order to measure the exact contribution of each age to the improvement at life expectancy at birth a method developed by J. H. Pollard was applied (Pollard 1982, 1989).

This method measures the contribution of different ages, or age groups to the change in life expectancy at birth in the interested period. The method is based on the relation that a change of φ in the force of mortality in an age range $(x + \Delta x)$, causes a change in life expectancy at birth equal to:

$$ {}_xp_o e_x \varphi \Delta x \qquad 4.1 $$

Where: ${}_xp_o$ is the probability of survival from age 0 to age x.

φ is the change of the force of mortality between period 0 and 1

e_x is the life expectancy at age x.

This relation is true only when it is assumed that there are no changes in mortality at other ages. This formula leads to the approximate formula which measures the gain in life expectancy at birth in a population between time 2 and 1:

$$e_{o(2)} - e_{o(1)} = \int (\mu_{x(1)} - \mu_{x(2)})\ {}_xp_{o(1)} e_{o(1)}\ dyx \qquad 4.2$$

where: $e_{o(2)}$ and $e_{o(1)}$ are the life expectancy at birth at time 2 and 1

$\mu_{x(1)}$ and $\mu_{x(2)}$ represent the force of mortality at age x at time 1 and 2

${}_xp_o$ as previously described.

Although this formula is expressed and applied here only to the life expectancy at birth, it can also be adapted and applied to changes to life expectancy at any other age *x*. Thus, if applied for changes between life expectancy at other ages formula 4.2 can be written as follows:

$$e_{x(2)} - e_{x(1)} = \int (\mu_{y(1)} - \mu_{y(2)})\ {}_yp_{o(1)} e_{y(1)}\ dy \qquad 4.3$$

One of the problems related to this method is its applicability. Formulae 4.1 and 4.2 are reasonably accurate as long as the improvements in mortality are modest. It always underestimates the gain in life expectancy if the improvements in mortality are positive. The reason for this underestimation is because the formula ignores the interaction effects between mortality improvements at different ages (Pollard, 1990). However, these problems are not so substantial to prevent its use in this case.

This assumption of the method is very important for the application to the Albanian data. As described at the beginning of this chapter Albania had a substantial improvement in mortality during 1950 to 1990. Thus, the application of this method to Albanian data will be very much influenced by this assumption. However, as indicated in Table 4.2, the errors involved are not very large and do not influence the interpretation of the results.

A simple form for calculation purposes of formulae 4.2 is given below:

$$e_{o(2)} - e_{o(1)} = \int (\mu_{x(1)} - \mu_{x(2)})\ W_x dx \qquad 4.3$$

where: w_x is a weighted factor calculated as follows:

$$w_x = \frac{1}{2}({}_xp_{0(2)}e_{x(1)} + {}_xp_{0(1)}e_{x(2)}) \qquad 4.4$$

The results of the application of this method to Albanian data for period 1950-1989 are given in Table 4.2 and Figure 4.5. The complete calculations of the method are shown in Appendix B.

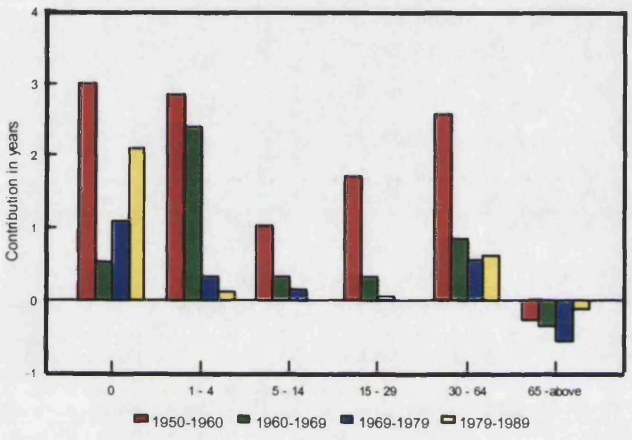
Table 4.2 Contribution of different age groups to changes in life expectancy at birth, 1950-1989.

Age-groups	1950-1960		1960-1969		1969-1979		1979-1989	
	Contribution to changes in e_0		Contribution to changes in e_0		Contribution to changes in e_0		Contribution to changes in e_0	
	in years	in %	in years	in %	in years	in %	in years	in %
0	2.997	27.4	0.526	12.8	1.101	66.3	2.111	75.7
1-4	2.829	25.8	2.396	58.3	0.329	19.8	0.131	4.7
5-9	0.671	6.2	0.272	6.6	0.092	5.6	-0.014	-0.5
10-14	0.369	3.4	0.058	1.4	0.049	3.0	0.022	0.8
15-19	0.415	3.8	0.075	1.8	-0.006	-0.4	0.042	1.5
20-24	0.639	5.9	0.132	3.2	0.050	3.0	-0.020	-0.7
25-29	0.662	6.1	0.121	3.0	0.025	1.5	-0.008	-0.3
30-34	0.601	5.4	0.162	4.0	0.077	4.6	0.028	1.0
35-39	0.524	4.8	0.049	1.2	0.116	7.0	0.039	1.4
40-44	0.402	3.7	0.116	2.8	0.121	7.2	0.057	2.1
45-49	0.449	4.1	0.063	1.6	0.053	3.2	0.112	4.0
50-54	0.344	3.2	0.226	5.5	0.015	0.9	0.095	3.4
55-59	0.096	0.9	0.013	0.3	0.251	15.1	0.055	2.0
60-64	0.173	1.6	0.247	6.0	-0.065	-3.9	0.240	8.6
65-69	0.103	0.9	-0.163	-4.0	0.014	0.9	0.176	6.3
70-74	-0.017	-0.2	0.171	4.2	-0.142	-8.6	0.174	6.3
75-79	0.529	.....	-0.069	.....	-0.117	.....	-0.310	.....
80+	-0.863	.....	-0.289	.....	-0.301	.....	-0.142	.....
$e_0(2)$-$e_0(1)$	10.923		4.106		1.662		2.788	
Error	0.523		0.394		-0.162		-0.088	

Note: The **Error figures** show the difference between the life table $e_0(2)$-$e_0(1)$ and the difference coming from the calculations of this method. This difference between $e_0(2)$-$e_0(1)$ for different periods appears with small changes from the difference of the e_0 values derived from the life tables. As explained, this is due to the assumption involved in the method applied, as well as to the approximations in calculations.

Table 4.2 gives the contribution of each age group to e_0 changes for the four decades under consideration. The life table values for both sexes are used. The contributions in the table are given in years and also in percentages. While Table 4.2 gives the contribution for 5 year age groups, Figure 4.5 shows these contributions for broader age groups in order to see that which part of mortality, infant, child or adult contributed the lion's share of mortality improvement in Albania during 1950-1989.

Figure 4.5 Contribution of different age groups to changes in e_0, 1950-1989.



There are two different dimensions that one can see this contribution to e_0 changes; one is the age contribution to life expectancy improvement, and the other is the contribution over time, i.e. which of the periods was the most important to mortality improvement in Albania.

If the age contribution is considered, it is clear that the major contributors are infant and child mortality. In the first decade, 1950-1960 infant mortality contributed 27.4 %, or approximately 3 years, while child mortality added 25.8%, or 2.8 years of the change in life expectancy at birth. Taken together, they consist of 53.2 % of the total change of e_0 in the first decade, 5.83 years out of a total change of 10.9 years. If the figures of Table 4.1 are considered again, one can easily see why changes of infant and child mortality brought more than half of the improvement of overall mortality. Table 4.1 shows that ${}_1q_0$ improved from 143.1 to 96.6, while ${}_4q_1$ improved from 105.3 to 58.6 per thousand.

What is significant during the first decade is the fact that all ages up to 70 have a positive contribution to changes of overall mortality. It is interesting to note that in addition to infant and child mortality, adult mortality improved substantially. The total contribution of adult mortality (ages from 15 to 60) is about 37.9 % of total improvement, or about 4.1 years. The ${}_{45}q_{15}$ values of Table 4.1 shows the same picture, with adult mortality improving from 27.1 to 16.4 per thousand. The major improvement was between 20 and 40 years.

During the 1960-1969 period, infant and child mortality still remain the main contributors to changes in life expectancy at birth. Infant mortality contributes 12.8%, while child mortality dominates with 58.3 %, or in years, 0.53 years for ${}_1q_0$ and 2.4 years for ${}_4q_1$. It is interesting to note here that, while for infant mortality the pace of improvement slowed down during this period, child mortality improvement continued at a similar rate. Taken together they contribute about 71.1% of the total change. Adult mortality continued to improve during this decade, but its contribution is much lower than in the first decade. Thus, ages 15 to 60 years contribute about 23.4 % of the total change, or 0.96 years.

Even during the next decade, infant and child mortality still dominate the improvement of life expectancy at birth. But, unlike the 1960-1969 period, in the 1969-1979 period it is infant mortality which has the highest improvement, contributing 1.1 years to the overall mortality, or 66.3 % of the total change. Infant and child mortality combined, contributed 86.1 % of the total change, while adult mortality added less than 1 year. Infant mortality improvement continues even in the last decade, where a change of ${}_1q_0$ from 74.1 to 45.4 per thousand contributes 75.7 % of the whole change of life expectancy at birth, or to 2.1 years in a total change of 2.8 years. The improvement of adult mortality also contributes to changes of e_0, but in this decade by a low percentage, 14.4%.

One other point that is significant in Table 4.2, and clearly seen in Figure 4.5, is the fact that ages 65 years and over appear to have had a negative contribution to changes of life expectancy at birth. This negative contribution has been present at all decades since 1950. As explained earlier in this chapter, this means that either the mortality of the elderly is worsening, or that age reporting for the old ages is becoming more accurate, and influences the calculation of death rates as a consequence. The later explanation is far more plausible than a worsening of mortality.

In general regarding the age contribution to changes in overall mortality, it can be said that all ages up to 65 have had a positive contribution, with the major contributors infant and child mortality. The adult mortality contribution is also high, but because of the low level of adult mortality, the scope for improvement was lower for adult mortality compared to infant and child mortality.

The other dimension of change, time, is also shown in Figure 4.5. One can easily see that 1950-1960 period is the most important in the changes of overall mortality. While for adult mortality the most important period is 1950-1960, for infant mortality is 1950-1960, and 1979-1989, and for child mortality the first two decades, 1950-1969 are the most important ones.

If one looks at the period as a whole, all categories of mortality below age 65 have made significant contributions to changes of life expectancy at birth. Thus, infant mortality contributed about 34.6%, while child mortality added about 29.2% and adult mortality (ages 15 to 60) about 31.8% of the total change.

4.4 ALBANIAN MORTALITY PATTERNS AND MODEL LIFE TABLES.

Sections 4.2 and 4.3 of this chapter show clearly that the age mortality pattern in Albania represents an extreme case where high infant and child mortality is present at the same time as a very low adult mortality. Although, the mortality trends have changed during the period under consideration, 1950-1990, still relationship between high infant and child mortality and low adult mortality has been present throughout. This relationship is clearly shown in Figure 4.4 in Section 4.3, where q_x values were plotted against age.

It is of particular interest to see if the Albanian mortality patterns are similar to any one of the model life tables. The Coale-Demeny Regional Model Life Tables were initially chosen for this comparison.

Coale and Demeny developed four sets of model life tables with different relationships between childhood (including infant), adult and old age mortality. The *North* model represents a mortality pattern with low infant and old age mortality, but with a high adult mortality. The *South* model represents a pattern with high mortality under age of 5, low mortality at ages 40 to 60, and high mortality among the elderly (over 65 years old). The *East* model is one with high infant and old age mortality relative to child and adult mortality. While the *West* model represents an average pattern, with variations of mortality by age that are not included in any of the other models (Coale and Demeny, 1983).

From this brief description of these sets of model life tables, it looks as the Albanian model might be similar to the South model, where a high child mortality and a low adult mortality is present. However, Table 4.3 and 4.4 give a comparison of all the model life tables with the Albanian mortality pattern. Table 4.3 shows this comparison for 1950, and Table 4.4 for 1989, for both male and female age-specific patterns. 1950 and 1989, which are the years of the beginning and the end of the period under consideration, were chosen to see if the age-specific pattern of mortality in Albania has changed with time.

Table 4.3 Comparison of age-specific Albanian mortality in 1950 with Coale-Demeny Model Life Tables.

Age-groups	Males				Females			
	West	North	East	South	West	North	East	South
0	12.95	11.71	14.94	13.3	11.18	9.92	13.22	11.66
1-4	11.38	12.96	10.95	13.75	8.74	10.16	8.23	11.59
5-9	13.54	17.58	13.52	13.94	11.34	15.18	11.20	11.93
10-14	15.61	17.77	13.50	14.07	14.19	15.77	12.12	12.61
15-19	17.38	18.97	16.35	15.70	15.59	15.79	13.67	14.10
20-24	15.79	17.43	14.64	14.64	14.70	14.04	12.71	13.02
25-29	15.38	16.64	13.48	13.63	15.24	14.90	13.60	13.43
30-34	15.14	15.75	12.88	13.01	15.34	15.04	13.60	12.93
35-39	17.54	17.98	16.19	15.40	15.29	15.06	13.53	12.55
40-44	17.02	16.76	15.59	14.60	17.53	17.62	15.92	14.74
45-49	18.69	17.76	17.94	16.29	19.30	18.64	17.88	16.00
50-54	17.64	16.05	16.99	14.50	18.57	17.52	17.04	14.91
55-59	21.48	18.73	21.89	18.94	20.87	19.25	19.85	17.31
60-64	20.91	17.52	21.13	17.85	22.00	20.68	21.38	19.19
65-69	22.93	20.01	23.17	20.17	25.00	24.67	24.63	23.19
70-74	22.78	19.36	23.23	20.55	21.34	19.08	21.52	19.20
75-79	24.65	22.36	25.00	23.87	23.92	22.34	24.05	22.50
Ages	Standard Deviation							
0-80	3.66	2.40	4.10	3.00	4.45	3.73	4.59	3.59
0-65	2.73	1.99	2.95	1.65	3.61	2.95	3.38	2.16

Note: Table gives the Coale-Demeny 'level' implied by each age-specific rate.

The tables were constructed on the basis of probability of dying values for Albania. These values were compared for each sex and age group, with the corresponding values of the Coale-Demeny model life tables. Through interpolation of ${}_nq_x$ values the corresponding levels of mortality for each sex were calculated. Thus, the values of Table 4.3 and 4.4 are the interpolated levels of mortality for each sex and age group (e.g. level 20.49 for males, west model, age 0-1 in 1989 is gained by interpolation. To find the level at Coale-Demeny Life Tables for ${}_1q_0$ of 47.01 for males in Albania in 1989 it is interpolated between ${}_1q_0$ values of 52.33 and 41.34 of levels 20 and 21 in the Coale-Demeny Regional Model Life tables (West).

Looking at Table 4.3, at the comparison for 1950, it is clear that a very high variation of mortality levels for all ages at all models is present. Most of this variation in levels is concentrated at the very

young and very old ages (ages 0 to 5 and ages over 65). In particular the mortality levels at old ages are quite different from the other ages. This is the reason that when the standard deviation was calculated, in order to compare the similarity of Albanian pattern and other models, it was seen reasonable to have two values of standard deviation; one for all ages, and one for ages up to 65, trying to eliminate this high variation at old ages.

Table 4.4. Comparison of age-specific Albanian mortality in 1989 with Coale-Demeny Model Life Tables.

Age-groups	Males				Females			
	West	North	East	South	West	North	East	South
0	20.49	20.28	21.36	22.96	19.72	19.64	20.80	22.77
1-4	19.93	21.09	19.60	21.45	19.59	20.74	19.37	21.31
5-9	21.15	22.47	20.50	20.49	20.90	21.92	20.47	20.62
10-14	22.04	23.07	21.80	21.55	21.83	22.87	21.40	21.41
15-19	22.67	24.14	22.72	21.37	22.94	24.11	22.69	22.58
20-24	22.72	24.32	22.87	21.45	22.68	23.91	22.35	22.25
25-29	22.79	24.43	23.05	21.88	22.76	23.93	22.34	22.27
30-34	23.02	24.69	23.28	22.82	23.12	24.00	22.78	22.67
35-39	23.15	24.49	23.34	22.82	23.37	23.95	23.15	22.65
40-44	23.53	24.38	23.70	23.31	23.54	24.25	23.22	22.72
45-49	23.88	24.05	24.15	23.43	24.50	24.82	24.29	23.48
50-54	23.28	23.18	23.86	23.32	24.40	24.85	24.14	23.21
55-59	23.31	21.54	23.90	21.62	24.73	24.60	24.30	23.15
60-64	22.63	20.00	23.06	20.16	24.34	24.12	23.93	22.48
65-69	22.81	19.82	23.05	20.02	24.47	23.96	24.04	22.37
70-74	21.12	17.20	21.63	18.77	24.55	23.72	24.41	22.77
75-79	20.09	16.18	21.26	19.50	23.32	21.33	23.53	21.88
Ages	Standard Deviation							
0-80	1.21	2.56	1.26	1.33	1.58	1.47	1.46	0.71
0-65	1.12	1.60	1.31	0.97	1.62	1.52	1.47	0.76

Considering the comparison of Albanian pattern with Coale-Demeny models for males, the lowest standard deviation is with the North model for all ages. The standard deviation for North is 2.40, while for the other comparisons is over 3.00. But, when the ages over 65 are eliminated, the lowest variation is within the South model - a value of 1.65 is obtained compared to 1.99 of the closest comparison with North model. This implies that the age-specific mortality pattern among males in 1950's Albania, is closer to South model when the old age mortality is not considered. This is clear if the variation of levels is considered by each age. The comparison with the North model shows a

higher variation among the young and adult ages. While the comparison with the South model shows that the variation is high among old ages relative to young and old ages. With regard to the comparison with the other two models, West and East, the standard deviations are high, because of a high variation among all ages. It is difficult to find a consistent pattern of variation within these two models.

More or less the same picture is found in the female comparisons of the age-specific mortality pattern in 1950. The lowest standard deviation values are for the North and South Models. However, in contrast with the males, the comparison with the South model has the lowest variation and is the closest to Albanian pattern. Thus, the standard deviation values are the lowest for the South comparison, not only when the ages over 65 are excluded, but also when they are included (respectively by 2.16 and 3.59).

In contrast to 1950, the 1989 comparison in Table 4.4 shows a lower variation among all the models. This means that in 1989, when life expectancy in Albania reached 70.7 years, the similarity of the age-specific mortality pattern of Albania becomes more similar to Coale-Demeny models than in 1950.

When male patterns are considered, just as in 1950, in 1989 when the old age mortality is eliminated, Albania has a pattern more similar to the South Model. In this case the elimination of ages 65 and over from the comparison makes a substantial difference. Thus, the standard deviation for the comparison with South goes from 1.33 to 0.97, while the other low variation models (West and East) do not change to the same extend. As in 1950, apart from the comparison with South, young ages have a lower level of mortality at the other models. One very distinctive point in the male comparison is that unlike for females, at old ages, Albanian men have worse mortality than the models, showed by lower levels of mortality at ages over 65. It might be this low level of mortality that makes the difference between the two values of standard deviation.

When the variation from the models for females is considered, it is clear that in 1989 as in 1950, the closest model to the Albanian age-specific mortality pattern is the South. In this case, the standard deviation is lower for the South comparison, both when all ages are considered and when the ages over 65 are eliminated. What is significant here is the scale of variation. Thus, in 1989 the variation of Albanian female pattern from the South model is half of the variation from the other models. The standard deviations for the South comparison is 0.71 and 0.76, compared to the closest values of the

East comparison of 1.46 and 1.47.

For both years and both sexes, Albanian age-specific mortality pattern is closest to the South model. It has to be emphasised that for males this similarity is present only when the comparison does not include ages over 65.

The main reason for the similarity to the South pattern is the fact that this set of model life tables has a European regional element in it. The South model was based on South European mortality experiences; the East model was based on the experience of Germany, Austria, Poland, Hungary, and so on. This is important in the case of Albania, which is part of Europe, not just geographically, but as shown above even in terms of its mortality pattern. However, in order to compare Albania with other mortality patterns worldwide, the United Nations model life tables are also considered.

Table 4.5 gives the same comparison as Tables 4.3 and 4.4 but now considering, not just the Coale-Demeny set, but also the United Nations set of life tables. The only difference here is that, in order to see the variation among the comparison with different models, the average absolute deviation from median values is calculated instead of standard deviation. These values were calculated based on the Mortpak programe (United Nations, 1988) COMPAR. The results are shown in Table 4.5.

Table 4.5 Comparison of age-specific Albanian mortality in 1950 and 1989 with Coale-Demeny Model Life Tables and United Nations Models.

Average Absolute Deviation from Median										
Models		United Nations Models					Coale-Demeny Models			
Years	Ages	Latin A.	Chilean	S. Asian	Far East	General	West	North	East	South
1950 Male	0-80	5.1	8.0	8.4	9.4	7.2	7.1	4.1	7.9	5.2
	0-65	4.4	7.4	7.0	8.5	6.3	5.9	3.5	6.2	3.5
1950 Fem.	0-80	8.3	9.6	9.4	11.0	9.2	9.2	7.4	9.4	6.9
	0-65	6.5	7.9	6.0	9.8	7.3	6.9	5.6	6.2	4.2
1989 Male	0-80	3.9	4.2	3.0	3.7	2.9	2.4	5.5	2.4	2.6
	0-65	2.2	3.6	2.2	4.0	2.5	2.1	3.7	2.4	2.0
1989 Fem.	0-80	2.7	3.6	2.6	4.3	3.0	3.0	2.4	2.9	1.3
	0-65	2.5	3.6	2.4	4.4	3.0	3.1	2.5	2.9	1.4

It is interesting to note that this comparison shows the same picture when the Albanian pattern is compared with Coale-Demeny models for both sexes and both years, 1950 and 1989. The closest model to Albania in this wider set is the South. While for females, for both years, the values of average absolute deviation show Albania very close to the South model, for males, this is true only when mortality experience of old ages (over 65) is eliminated.

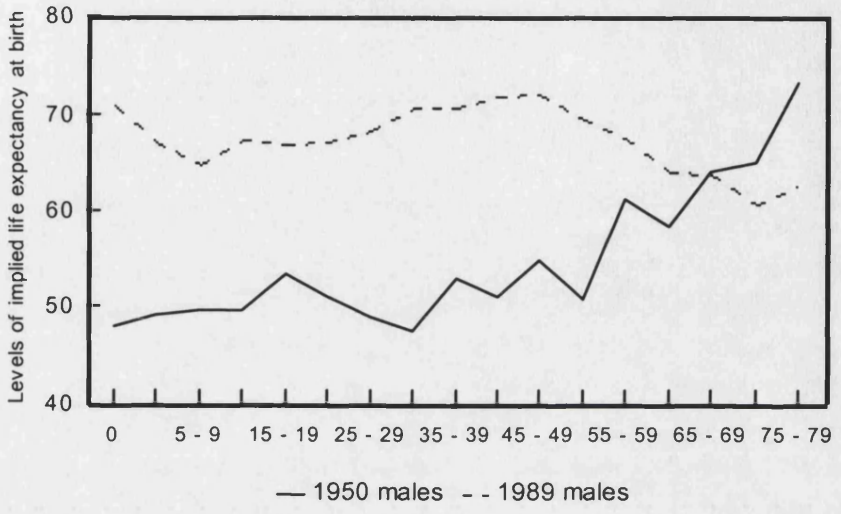
If the comparison with UN models is considered, it is clear that none of the models is closer to Albanian pattern than the Coale-Demeny South model. The variation among the models is very high. In 1950 for the males, the closest model is the Latin American one. While for females in the same year, the variation is very high compared with the South model of Coale-Demeny. A similar picture holds for 1989, when for females the variation is very high and none of the models is close to Albanian pattern. The closest pattern for males is again Latin American and also the South Asian, when mortality over 65 is eliminated.

Overall, for both sexes, it can be concluded that for both 1950 and 1989 the closest model to the Albanian age pattern of mortality is the South model. It is important to bring again here the fact that this model is based on life tables from South European countries, such as Spain, Portugal and Southern Italy, which like Albania, are Mediterranean countries. The reasons of these similarities will be later analysed in details when the international comparisons and cause specific mortality will be considered.

In order to see changes in the Albanian mortality pattern from 1950 to 1989, and the deviation of this pattern from Coale-Demeny model life tables, Figures 4.6 and 4.7 were drawn. These figures show the variation of the implied levels of mortality by age for 1950 and 1989 for both sexes. The implied levels of mortality are expressed as interpolated values of life expectancy at birth by age (not interpolated values of levels, as in Table 4.3 and 4.4). The best estimate from the comparison with Coale-Demeny models is chosen. In both the cases as explained the closest estimate was the South model comparison.

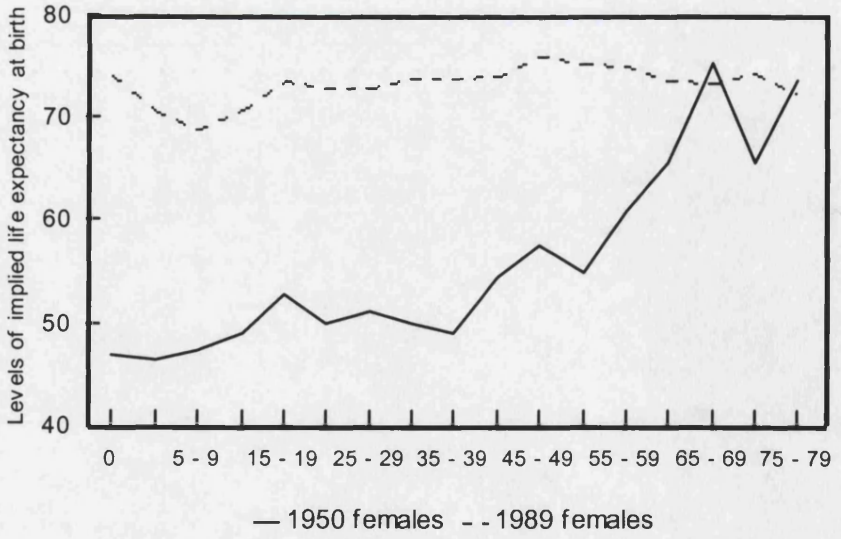
The first thing that attracts attention from Figure 4.6 is that 1950 and 1989 patterns of mortality are quite different. The two years, when compared to each other do not show any similarity. On the contrary they are quite different.

Figure 4.6. The change of male mortality levels in Albania compared with Coale-Demeny South model.



It is also clear that in 1989 the pattern is 'smoother'. This means that the variation from South model is smaller in 1989 compared with 1950. If the Albanian model was similar to South model, the lines should have been straight at levels of 67.9 and 51.6 of the life expectancy at birth, respectively for 1989 and 1950. In fact they deviate quite a lot from the straight line, which proves again that, although the South model was closer to Albanian age-specific mortality pattern, still Albanian pattern is different during the whole period of consideration, 1950-1989, but especially in the early years.

Figure 4.7 The change of female mortality levels in Albania compared to South model.



The same can be said for females in both dimensions of comparison, in time and when compared to the South model of Coale-Demeny set of life tables. The 1950 and 1989 patterns are different from one another and from the South model. In particular the 1950 pattern is very different from the South model (from the straight line crossing at the level of life expectancy at birth of 51.3 years). What is of particular

interest here is that the female pattern is 'smoother', compared with that for males in 1989. This implies that in 1989, the female age-specific mortality is relatively similar to the Coale-Demeny South model.

Despite the similarities with the South model for both of the years, it can be concluded that, when the relationship between infant and child mortality relative to adult mortality is considered, the Albanian results are not replicated by any of the models. This is mainly due to the presence of very high infant mortality.

4.5 CONCLUDING NOTES.

The analysis of mortality trends and pattern in Albanian since 1950 was dealt with in this chapter and the following points can be drawn from this analysis:

During the period under consideration, 1950-1989 Albanian mortality improved dramatically, from a life expectancy at birth of 51.7 years in 1950 to 70.7 years in 1989, an improvement of 19.1 years.

Most of this improvement happened during the first decade, 1950-1960, where life expectancy at birth improved by 10.4 years. Mortality continued to improve in the later decades, but this improvement was gradual and at a slower pace. In contrast with the experience of other East European countries, Albanian mortality did not worsen in the 1980s. On the contrary, it continued gradually to improve.

The largest gains occurred in infant and child mortality, which taken together contributed about 63.8 % of the total improvement in overall mortality during the period 1950-1989.

Despite the dramatic improvement in infant and child mortality, from 143.1 to 45.4 and 105.3 to 15.5 deaths per thousand respectively, Albania still has relatively high infant and child mortality, when compared to its level of life expectancy at birth of 70.7 years.

In contrast with infant and child mortality, when adult ages are considered, Albania had and still has very low adult mortality.

With regard to sex differentials in mortality, in the 1950s Albania had a female disadvantage (life expectancy at birth was similar for the two sexes). This phenomenon is found in some other traditional societies, where male infants and children were advantaged in terms of care and nutrition compared with females. In later decades, this phenomenon disappears, and in 1989 a six years female advantage is found in life expectancy.

When the age pattern of mortality in Albania was compared to model life tables, it was concluded that Albanian pattern is most similar to the Coale-Demeny South model for both sexes, implying similarities of the age pattern of mortality between Albania and other Mediterranean countries.

Chapter 5. CAUSE SPECIFIC MORTALITY, 1950-1990

5.1 INTRODUCTION.

The trends and patterns of mortality in Albania were analysed in detail in Chapter 4. It was concluded that a very low level of mortality was present in Albania at the end of eighties despite the circumstances of a very poor economy. Life expectancy surpassed seventy years by 1990. It was also found that despite the overall improvement of mortality, infant and child mortality remained by far the worst in Europe. On the contrary, adult mortality was low not just in the eighties, but had been low even in the fifties and sixties.

The analysis of the mortality and health transition in Albania is incomplete, if the cause-specific pattern is not considered. In order to address the question of the low mortality among adults in Albania, one has to see what are the main causes of death in these ages. Are there similarities to cause-specific patterns elsewhere, or does Albanian pattern represent a unique case? Can the relatively high infant and child mortality levels, compared with low adult mortality, be explained through the analysis of causes of death? Does the cause-specific mortality pattern reflect the social and economic experience of the country? These and many other questions related to cause specific mortality will be dealt with in this chapter.

The analysis of cause-specific mortality starts with a short description of the quality and availability of cause-specific data in Albania. A description of the incidence of disease and the main causes of death in pre-World War II Albania follows. Section 5.4 provides a detailed analysis of the cause-specific pattern based on cause-specific life tables for selected years during the period under consideration. The analysis continues with the contribution of different causes of death by age to the improvement of life expectancy at birth, and concludes with the main findings from the analysis of the causes of death in Albania.

5.11. Data on cause specific mortality in Albania.

Chapter 3 described the availability and quality of mortality statistics, but without any reference to cause specific mortality data. However, the Chapter concluded that the quality of mortality statistics was good enough to analyse the mortality trends and pattern during 1950-1990, the period under consideration. It was also mentioned in Chapter 3 that, on becoming a member of the United Nations, Albania started applying international standards on the collection of mortality statistics. Thus, the

death certificate introduced in the fifties started to record the causes of death as well as other information related to the decedent. The certificate was completed by the local physician. This introduction initiates the collection of cause specific mortality statistics in Albania.

The immediate situation after the War in Albania is characterised by a very backward health system and a lack of medical personnel. The number of physicians was very low, with about 1.1 physicians per 10,000 people in 1950. Moreover, the remote areas of the countries did not have any access to medical personnel or to medical treatment (Mason et al, 1945, p. 120). This explains the fact that in the immediate years after the War, the number of deaths certified by a physician was very low. Thus, the percentage of certified deaths ranged from 20% to 57% in the period 1950-1955. Parallel to the expansion of medical services and medical personnel in the country, the diagnoses of death started improving. Thus, the percentage of certified deaths increases from 60.4% in 1957 to 100% in 1978, while the number of physicians per 10,000 population increased from 3 in 1960 to 16.8 in 1980.

It is clear that the cause specific data in the first two decades of the period under consideration are problematic, but later on in the seventies and eighties, similar to the improved quality of death registration, the diagnosis of deaths improves and the data can easily be used to analyse the cause specific mortality patterns in Albania. Moreover, despite the fact that the percentage of the certified deaths was low in the fifties and sixties, this does not mean that the data are useless, and that they cannot shed light on cause specific mortality pattern in the country.

In order to make use of the data in the first two decades, 1950-1970, the years with the highest percentage of certified deaths were chosen - 1957 with 60.4% and 1968 with 67.5%. For the remaining period 1978 and 1987 years were chosen for the analyses. 1987 was chosen for two reasons. First, because years 1988, 1989 and 1990 were found to be problematic with reference to the quality of death diagnoses. Mistakes were found in the coding of causes of death, and different categories of diseases were either heaped or very low compared to the same categories of previous years. Another reason why 1987 was chosen, is because it is the last year of the period under consideration with qualitative data. After 1990 Albania experienced political, economic and social changes, which to a certain degree were also reflected in the data collecting system.

In order to make use of the data for 1957 and 1968, work was required to redistribute the remaining 39.6 and 32.5% of the missing deaths by cause and age. To get the best possible estimates, the redistribution was done based on three dimensions: a) the regional distribution of deaths, by age and

cause; b) the available distribution of deaths by age, and c) the distribution of deaths by cause and age in the years where the deaths were 100% certified.

The regional distribution of the available data was first checked to see if there was any variation by region in the percentage of certified deaths. For both 1957 and 1968 the variation was generally within a narrow range of (-5%, +5%) from the average certified completeness. The only exceptions from these range were Tirana, the capital, which had a very high percentage of certified deaths of more than 80% in both years, and three northern districts Dibra, Kukes, and Tropoja, which had a lower percentage in both years, less than 50%. However, it is important to mention that the deaths registered in those districts comprise only 10% of the total deaths in Albania during 1950-1970 period. Thus variation among the districts was low and the available data on certified deaths can be considered as representative at the national level, and on that basis we can generalise about cause-specific mortality in Albania. However, it was considered that analysing the cause-specific mortality pattern based just on the available data was not enough to apply some demographic techniques. Thus, a redistribution of the missing certified deaths on national level was undertaken. This redistribution was not only based just on the regional distribution of the available certified deaths, but also on the distribution of deaths by cause and age.

The redistribution of the remaining deaths was done simultaneously on both dimensions; based on the existing age-cause-specific structure of deaths, and on the distribution by age and cause of the deaths for a completed year. In the case of 1957 and 1968, the distribution of deaths in 1978 was also taken into account. For particular categories of diseases, such as cancers and cardiovascular diseases, a comparison with the data of Greece was undertaken to see if there were similarities and, on that basis adjusting the Albanian data.

After the missing data were analysed for 1957 and 1967, the multiple-decrement life tables by cause of deaths for 1957, 1968, 1978 and 1987 were produced. On the basis of life table functions, the analysis of trends and pattern of mortality by age and cause is carried out in section 5.4 of this chapter.

It is very important to mention that for the first two decades in which the data were not complete, the analysis of cause-specific mortality needs to be done with caution. But, although the data were not complete in this period they still shed light on the situation of cause-specific mortality pattern in the fifties and sixties. As the further analysis in this chapter describes, the data will show the same picture as one would expect to find in 1950-1970 Albania.

With reference to the classification of diseases, Albania has used the international standards which comply with WHO regulations. Thus, the International Classification of Diseases (ICD) has been applied from 1950 to the present day, with the changes introduced from time to time by the WHO.

Preston in 1976, while analysing the death rates for some developing countries used a classification of 11 major groups of diseases: respiratory tuberculosis, other infectious and parasitic diseases, neoplasms, cardiovascular diseases, influenza/pneumonia/bronchitis, diarrhoea, certain chronic diseases, maternal diseases, diseases of infancy, violence and other/unknown (Preston, 1976a, p. 4-6). In our analysis of cause-specific mortality we will use broadly the same classification and also the recommended ICD categories such as cancers, cardiovascular diseases, and respiratory diseases. However, we will use some other categories which are very distinctive to the Albanian case, such as tuberculosis or pediatric disorders. The analysis of causes of death is, thus based on the following grouping of diseases:

1. Tuberculosis of all Kinds (ICD 9, 010-018)
2. Infectious and Parasitic Diseases (ICD 9, 001-139, excluding tuberculosis)
3. Cardiovascular Diseases (ICD 9, 390-459)
4. Respiratory Diseases (ICD 9, 460-519)
5. Cancers (ICD 9, 140-239)
6. "Old Age"[1]
7. Gastro-Intestinal Diseases (ICD 9, 520-579)
8. Paediatric Disorders[2]
9. Others.

As will be shown later in this Chapter, tuberculosis was a major killer in post-War Albania, so it is considered separately from the Infectious and Parasitic diseases. The category of "Old Age" was very enlarged in the fifties and sixties, which means that it was used as a "safe" category for mortality over 60 years. It is itemized separately in order to see how diagnosis improves in the later period, whereas in the seventies and eighties the rate of mortality in this category becomes zero. Having the highest infant and child mortality in Europe, it was thought important to separate pediatric disorders from the other causes of death, in order to assess their contribution to the level and changes of infant and child mortality. As will be seen later in this Chapter, gastro-intestinal diseases in Albania are high especially at young ages, so they are shown separately from other causes.

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[1]"Old Age" was a category used in the previous classifications. That is also why in the later years it will take zero value when ICD 9 is applied.

[2]This category is related to some of the causes of the chapter 630-639 in ICD 9, which only affect ages 0-5 years old.

5.2 MAIN CAUSES OF DEATH AND INCIDENCE OF DISEASE IN PRE- WORLD WAR II ALBANIA.

As explained in Chapter 4 it is very difficult to judge the health situation of a population during a period in which the data either do not exist or there are very few limited publication on them. This was the situation of Albania in the early stages of the creation and consolidation of Albanian state at the beginning of this century.

The first information on the country's health came from the different armies located in Albania during the First World War. The reputation was that the country was very unhealthy and malarious. It is ironic that despite the hardships brought upon Albania by these foreign countries' armies, the public health of the country to a certain degree benefited from them. The experiences of these armies later drew the attention of organisations such as the Health Committee of the League of Nations, and the Rockefeller Foundation to undertake measures to improve the country's horrifying health conditions. In addition, during the World War I, the French, Italian and Austro-Hungarian armies used their extensive medical facilities to help the civilian population.

In the 1920s it was clear that Albania was a country with a large number of endemic infectious diseases; Malaria was an especially serious problem. As a result of this reputation, in 1922 and 1924 the League of Nations decided to carry out a survey of health conditions in Albania. Dr. W. E. Haigh conducted the survey and his report on Albania contains a considerable amount of information on the prevalence of disease, as well as the social-economic conditions of the population.

Haigh found that the population was living at a very low economic level. Undernourishment was everywhere apparent, and accompanied by malnutrition. There were only a few doctors in some towns, who were of very little help for the health situation in the country. Most of the rural population was dying without seeing a doctor. Thus, more than half of 2540 villages in 1924 had never been visited by a doctor (Mason et al, 1945, p. 120).

Haigh's report shows that smallpox, typhus fever, and relapsing fever were common, though not endemic (Haigh, W. E. 1925). The occurrence of these diseases were high , but sometimes not diagnosed. A clear case of this was the prevalence of typhoid fever, which in 1924 although not endemic throughout the country, in Gjirokastra[3] it was certainly endemic(see also footnote 3, at

[3]Gjirokastra is a major city in the South of Albania

chapter 1, p. 23). Intestinal parasitic diseases were very common. Influenza killed a large number of Albanians in 1918-1919. Outbreaks of scarlet fever, whooping-cough, and measles were on annual occurrence. One of the most widespread diseases was found to be tuberculosis. In contrast to other major killers in that period in Albania tuberculosis was very common, not just in the lowland areas, but predominantly in the highland areas. The disease caused high mortality throughout Albania, especially in Gjirokaster (in the South), Shkoder (in the North) and Kruje (in mid-Albania).

As well as tuberculosis, syphilis was very widespread, especially in rural areas. Sometimes Haigh found whole villages affected by syphilis. Cancers were rare, and so were cardiovascular diseases. Most important of all malaria was present nearly everywhere. More than half the patients attending dispensaries and clinics were suffering from malaria[4]. This conclusion of Haigh's report was also supported by other information coming from the Albanian health authorities. Thus, for a later period, 1927-1932 the number of people treated for malaria was as follows: 29,659 persons in 1927, 23,443 in 1928, 25,863 in 1929, 22,209 in 1930, 21,145 in 1931, and 27,881 in 1932 (Skendi, 1957, p. 259). The high prevalence of malaria, tuberculosis and syphilis during 1927-1932 is shown in Table 5.1.

Table 5.1 Prevalence of Three Endemic Diseases in Albania 1927-1932

Diseases	1927	1928	1929	1930	1931	1932
Malaria	42.0	41.0	40.5	33.0	31.0	34.0
Syphilis	2.8	2.3	2.3	1.8	1.5	1.5
Tuberculosis	1.5	2.0	1.5	1.3	1.3	1.2
Other	53.7	54.7	55.7	63.9	66.2	63.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: The figures are calculated as percentages of patients treated by health clinics.
Source: This table is taken from Skendi's book on Albania in 1957, p.259

It is clear from table 5.1 that malaria was the most common disease in Albania during 1927-1932. It also shows clearly that the prevalence of tuberculosis and syphilis was also relatively high. Apart from the three above mentioned diseases, one other disease reported to be common in Albania was measles. While diseases such as rabies, typhoid fever, scarlet fever, diphtheria, epidemic meningitis etc., although prevalent were not as common in this period (Mason et al, 1945, p. 120-1)

As mentioned above, of all endemic diseases malaria was the most important and the most common one in Albania before World War II. As reported in research carried out by the Rockefeller

[4]The three forms of malaria parasite, *Plasmodium falciparum, P. vivax,* and *P. malariae* occured in pre-War Albania (Mason et al, 1945, p. 124)

Foundation, the disease was endemic below 3600 feet, and hyper-endemic in parts of the coastal areas and river valleys (Hackett, 1944, and Bates, 1941). Some of the data supporting this conclusion were published by Hackett in 1944 in a paper on "Spleen Measurement in Malaria" (Hackett, 1944). Hackett's findings are given in Table 5.2.

The table gives two measurements of malaria, one is the spleen enlargement and the other is the existence of the malaria parasite in the blood. The cities are ranked based on the level of spleen enlargement, indicated by the spleen index. Both the indicators show the same picture on the prevalence of malaria in Albania.

It is clear that malaria was hyper-endemic in Vlora, Elbasan, Kavaje, and Berat, and severely endemic in Shkodra and Durres. The relatively favourable place in the table occupied by Durres and Tirana is probably explained by the measures taken to reduce mosquito breeding in these places. It needs to be mentioned that Tirana (the capital) and Durres (the main port of the country) were the most important cities of the country, and most of the measures against malaria were introduced in those two cities. Vlora, Durres and Kavaje were all coastal cities, while Berat and Elbasan were cities built in river valleys.

Table 5.2 Measurements of malaria in Albania resulting from a seven cities survey, 1932-1938

Cities	Average enlarged spleen	Spleen Index	Parasite Index
Tirana	1.45	24.9	4.7
Durres	1.44	26.6	5.2
Shkoder	1.52	30.3	3.7
Berat	1.78	50.5	10.2
Kavaje	1.81	51.5	9.8
Elbasan	1.72	52.2	10.7
Vlore	1.87	56.7	9.1

Note: A survey of 28,228 children was carried out in 1932-1938 in order to measure the spleen enlargement and the existence of malaria parasites in blood in seven major cities of Albania, covering almost all the country apart from the remote areas of north-eastern Albania.

As to the distribution of these infectious diseases, it is clear that they were more common in the lowland Albania (Vlora, Durres, Kavajë, Elbasan, etc.). The very high exchange of infectious diseases of many kinds was facilitated by the descent of villagers to the plains for agriculture and pasturage, the migration of shepherds from malarious regions to the hills, the visits of the peasants to the market areas, and so on. In general, health conditions were better in the mountainous regions of the country. The physical terrain isolated the North-Eastern part of Albania from the spread of

some endemic diseases, such as malaria. However, the people living in these areas had to deal with other diseases arising from the physical environment and their way of life, such as malnutrition, syphilis and tuberculosis. These diseases, because of the virtually hermetic isolation of the area, were virtually untreated until well after the Second World War, and thus they were passed from one generation to the next (Mason et al, 1945; Skendi, 1957, p. 255).

One other important feature that facilitated the wide distribution of infectious and parasitic diseases in pre- and post-War Albania was the very large size of the household. Being a patriarchal society, Albania remained the kinship type household for a long time. Throughout the country, but in particular in the north even today can be found individual households with a number as large as 20 members. Thus, in Mirditë - North Albania, before WWII, the average household number was about 10-14 members, while in 1900 there were families even with 100 members in a household (Kaser, K. 1995, p. 270-274). With the move of Albanian society from a traditional a relatively moderate one, these relations changed, and so did the housing conditions. However, it is important to mention that, despite the changes Albania still remains traditional with the number of members per family in 1989 of 4.7, with 5.3 in rural and 3.9 in urban areas (INSTAT, 1992, p. 364).

Whatever the political complexity of the regime in Albania before and after World War II, each of them has had to deal with the very difficult conditions of public health in Albania. Thus, during King Zog's regime, in pre-World War II Albania, the health authorities concentrated their focus on malaria. The Department of Health distributed large amounts of quinine on a regular basis. It distributed approximately 20 pounds of quinine annually to every hospital, dispensary, or pharmacy. Nevertheless, one has to take into account that these institutions were very few in number, and almost inaccessible in some areas of the country. Apart from the Albanian health authorities, a large amount of work was done by foreign organisations or governments. Thus, the Rockefeller Foundation, after two years of exhaustive research, established an anti-malarial service in Albania in collaboration with the Department of Health. In 1929 the first malaria stations were created in Tirana and Durres, and one year later more stations were set up in Elbasan, Shkoder, Berat, and Vlore.

Under the Italian occupation (1939-1943) the situation regarding malaria was considerably improved, as a result of the improvement of sanitary conditions, as well as the significant contribution of Italian doctors and specialists. During this period, the functions of the Rockefeller Foundation were taken over by the Italian Marciafava Istituto Malariologico, which completed one of the most extensive malaria surveys conducted in Albania. This survey showed that 12855 children under age of 10

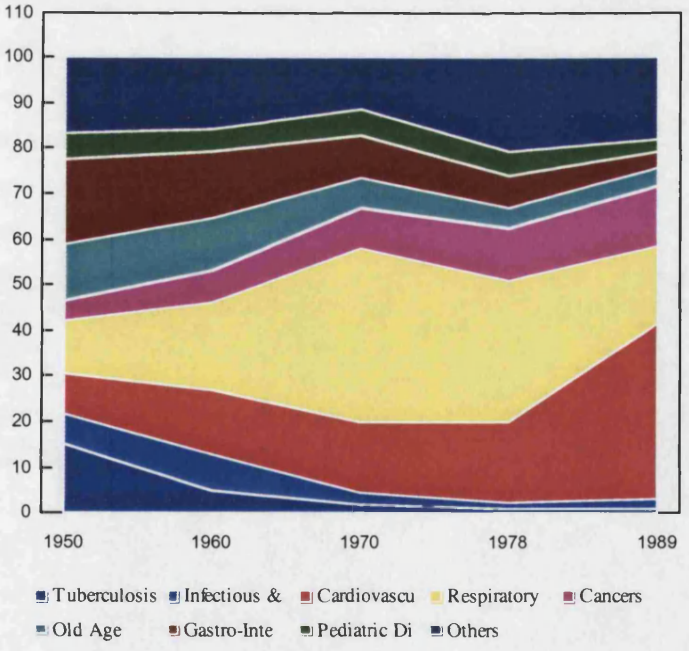
(about 5% of the people in this age group) were infected with malaria.

5.3 COMPOSITION OF DEATH BY CAUSE 1950 - 1990.

Despite the efforts of the previous government and different organisations to reduce the incidence of infectious and parasitic diseases in Albania, especially malaria and tuberculosis, the 1945, the first year after the War, found the public health in Albania in a very poor state. Malaria was prevalent in many parts of Albania and so were other infectious, like tuberculosis and syphilis.

The government in collaboration with UNRRA, applied different measures to improve the situation of public health in Albania, such as draining polluted waters, DDT spraying of infected areas, vaccinating the population for some infectious diseases, and so on. By the end of 1946, UNRRA had shipped typhus vaccine for 30,000 people and brought enough anti-diphtheria serum to inoculate all children from one to ten years of age (Skendi, 1957, p. 260). These efforts bore fruit very quickly. From 1947 to 1949 the number of malaria cases decreased slowly (in 1949 there were 238,266 malaria cases), but the real turning point came in 1951, which was apparently a successful year in the anti-malaria campaign, with the number of malaria cases not exceeding 75,000.

Figure 5.1. Proportionate contribution of causes of death, 1950-1990



Despite the high incidence of infectious and parasitic diseases in pre- and immediately post- War Albania, the data on the number of deaths resulting from these causes were few and incomplete. Mortality by cause of death can only be studied in detail after 1950. Figure 5.1 gives the proportionate contribution of causes of death for the period 1950-1990. The high incidence of infectious and parasitic diseases is reflected in the number of deaths resulting from these causes. Thus, in 1950, infectious and parasitic diseases (including tuberculosis) accounted

for 21.8% of the total deaths for that year.

What is significant for 1950 is that the number of deaths caused by tuberculosis of all kinds was very high. Tuberculosis counted for about 15.2 % of all deaths. In 1950 there are low percentages of cancers and pediatric disorders and relatively lower cardiovascular diseases, respectively 4.5%, 6% and 8.9%. Respiratory diseases are relatively high with 11.6% of all deaths, and so are gastro-intestinal diseases.

If one looks at the mortality transition from 1950 to 1990, it is clear that the pattern changes as life expectancy improves. Thus, the infectious and parasitic (tuberculosis included) diseases decline and almost disappear in the seventies and eighties. While their leading position is occupied by cardiovascular diseases and cancers. Most of the other categories go down steadily: pediatric disorders, gastro-intestinal diseases, and "old age". It is understandable that parallel to the improvements in the diagnosis of disease, mortality from "old age" goes down.

There are two further points to be drawn from Figure 5.1 related to health transition that are specifically relevant to Albania. First, respiratory diseases have been and are still one of the major killers in Albania[5]. Even allowing for the possibility that this category might have been used as a "safe" category for undiagnosed deaths, which is an experience found in other countries, it is still high. This might reflect the poverty of Albanian society, as poverty is more likely to affect the diseases of respiratory system more than other categories. Thus, in 1960 diseases of the respiratory system accounted for 19.2%; in 1970 for 38.0% of deaths. After 1970 it starts going down, but remains one of the major causes of death even in the eighties, with about 16.7% of all deaths.

The other distinctive point from this figure is the existence of a high level of deaths from pediatric disorders. Thus, from 6% in 1950, they remain almost constant till 1978 at 5.3%, but later on go down to 2.6% of all deaths, although, this value is still high compared with other European countries. With a high infant and child mortality throughout the period under consideration, one can expect to see a relatively high number of deaths from pediatric disorders.

Deaths from cancers show a gradual increase during 1950-1990, which might indicate an improvement of diagnosis, because mortality from cancers is getting worse, or both. Mortality from "old age" has gone down, as expected when diagnosis improves. The decrease of the number of

[5]The respiratory diseases analysed here are mainly influenza, pneumonia and bronchitis. However, the major cause among Albanians remains pneumonia.

deaths from this category is likely to have influenced the increase of categories of cardiovascular diseases or cancers. However, the death composition produces only an incomplete view about the development of cause-specific mortality pattern in Albania. The detailed analysis of cause-specific mortality by age, through the life table functions in Section 5.4, is needed to shed more lights on the mortality and health transition in Albania.

If one compares the Albanian mortality transition with that of other European countries, it is clear that Albania has gone through the same stages as other European countries. The reduction of infectious, parasitic diseases and gastro-intestinal causes is balanced by an increase in cardiovascular diseases and cancers in the cause of death hierarchy. The main difference in this transition is the timing of change. Thus, the Albanian pattern of 1950 can be found in other European countries, such as Italy, Norway, England etc. in about the 1910s (Caselli, 1996). The Albanian transition has been more "compressed" in time compared to other European countries. One other important element of Albanian transition is that for some particular diseases, for example respiratory diseases and pediatric disorders, this transition has some similarities to that of other developing countries.

Before a detailed analysis of cause-specific mortality by age is described in Section 5.4, the crude rates of mortality by cause were calculated. Table 5.3 gives these rates for each group of causes for the selected years.

Table 5.3. Death Rates per 10,000 population by cause, 1950-1980 (Male and Female)

Causes of death	1957	1968	1978	1987
1. Tuberculosis of all kinds	5.82	1.89	0.66	0.16
2. Infectious & Parasitic	7.01	2.91	0.48	1.10
3. Cardiovascular Diseases	9.73	12.97	11.33	21.20
4. Respiratory Diseases	23.28	23.44	20.52	9.60
5. Cancers	2.41	8.52	8.10	6.84
6. Old Age	20.03	6.01	2.75	0.00
7. Gastro-Intestinal	17.00	8.75	4.89	3.18
8. Pediatric Disorder	6.66	5.14	3.39	1.32
9. Others	21.02	10.28	14.15	12.68

The death rates given in Table 5.3 show the same proportionate contribution of causes of death, but allow comparisons across time. Thus, infectious and parasitic diseases were high in the fifties and than go down in the seventies and eighties, eventually almost disappearing. Similar to infectious diseases, old age mortality moves from 20.3 in 1957 to zero in 1989. Gastro-intestinal mortality also

declines from 17.00 in 1957 to 3.18 in 1989. However, cardiovascular and cancers increase, with cardiovascular diseases becoming the major cause of death in 1989, with a rate of 21.2 per 10,000 persons, and the cancers have gradually increased from 2.41 to 6.84, occupying the third place in the hierarchy of causes of death in 1989. It is interesting to note that respiratory diseases remain high, despite the reduction during the sixties and seventies.

5.4 CAUSE SPECIFIC MORTALITY DURING 1950-1990: TRENDS AND PATTERNS.

The analysis of mortality based on death composition and crude death rates by cause gives a general view on the trends and changes of the cause-specific pattern of mortality. Different causes of death affect different ages, and sometimes the same cause of mortality has a different force at different ages. Thus, the further analysis of cause specific patterns requires a detailed analysis by cause and age.

This section looks at the variation of mortality by cause and age, focusing on the main causes of death during infancy and childhood, adulthood, and old ages, too. The analysis in this chapter is based on the analysis of life table functions. The cause-specific life tables are calculated for years 1957, 1968, 1978, and 1987, and the full tables are given in Appendix C. *Net Probability of Dying*[6] (${}_nq^j_x$) is used as the function that best reveals the changes of cause-specific pattern and trends by age and cause.

The cause-specific analysis in this section is carried out in two ways. First, it looks at the variation of mortality by cause in specific age-groups. Thus, for instance, the variation by cause within infancy is analysed, looking at the main causes of deaths for infants. Overall, the analysis is based on 5 main age-groups: ages 0-1, 1-5, 5-15, 15-60, and 60-70. The second dimension of this analysis is based on the variation of mortality by age for specific causes. The main causes considered in this analysis are: tuberculosis of all kinds, cardiovascular diseases, respiratory diseases, and cancers.

5.41 Analysis of the cause specific mortality by age.

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[6]Net Probability of Dying is the probability of dying by cause "j" at age "x", where only deaths by cause "j" are considered, and the intermediate influence of other causes is eliminated. A description of the calculations is given in Appendix C.

As previously mentioned this section looks at causes of death in three main stages of life: childhood (through ${}_1q^j_0$ and ${}_4q^j_1$), adulthood (through ${}_{45}q^j_{15}$), and old ages (through ${}_{10}q^j_{60}$). Mortality at ages 5-15 will also be considered, but as the analysis of this section will show, at these ages mortality has been insignificant compared to other ages. Whenever the probability of dying (${}_nq_x$) is shown, it refers to the net probability of dying.

Table 5.4 gives the values of probability of dying for ages 0-1 and 1-5 by the main causes of death for males and females separately. The values of ${}_nq_x$ are given in percentages.

Table 5.4 Net probability of dying in % for ages 0-1 and 1-5, by causes of death

a. Male in%

Causes of death	${}_1q_0$				${}_4q_1$			
	1957	1968	1978	1987	1957	1968	1978	1987
1. Tuberculosis	0.14	0.03	0.03	0.00	0.23	0.02	0.01	0.00
2. Infect. & Parasit.	0.94	0.40	0.11	0.34	0.75	0.18	0.03	0.05
3. Cardiovascular	0.17	0.22	0.22	0.12	0.14	0.09	0.07	0.09
4. Respiratory	3.09	4.42	4.33	2.44	2.50	1.16	0.81	0.74
5. Cancers	0.01	0.03	0.09	0.07	0.01	0.02	0.06	0.05
6. Gastro-Intestinal	2.70	1.69	1.09	0.91	1.57	0.38	0.23	0.14
7. Pediatric Disord.	1.42	1.61	1.24	0.75	0.55	0.17	0.14	0.04
8. Others	1.59	0.39	0.42	0.19	1.21	0.31	0.27	0.56
All causes	10.06	8.79	7.53	4.82	6.96	2.33	1.62	1.67

b. Female in%

Causes of death	${}_1q_0$				${}_4q_1$			
	1957	1968	1978	1987	1957	1968	1978	1987
1. Tuberculosis	0.11	0.03	0.01	0.00	0.22	0.01	0.00	0.00
2. Infect. & Parasit.	1.02	0.49	0.08	0.23	0.78	0.26	0.03	0.04
3. Cardiovascular	0.16	0.15	0.15	0.12	0.18	0.06	0.05	0.10
4. Respiratory	2.81	4.78	4.45	2.30	2.83	1.52	0.78	0.79
5. Cancers	0.01	0.03	0.07	0.07	0.00	0.04	0.09	0.04
6. Gastro-Intestinal	3.05	1.80	1.02	0.79	2.35	0.54	0.27	0.14
7. Pediatric Disord.	1.58	1.60	1.42	0.68	0.74	0.13	0.17	0.06
8. Others	1.87	0.44	0.43	0.15	1.48	0.33	0.24	0.56
All causes	10.61	9.32	7.63	4.34	8.58	2.89	1.63	1.73

If we look at the values of probability of dying at ages 0-1, it is clear that for both sexes in 1957 the

main causes of death are respiratory diseases, gastro-intestinal diseases, pediatric disorders and infectious and parasitic diseases. However, the rates for respiratory and gastro-intestinal diseases are almost double the rates from other diseases. Thus, the probability of dying in the first year of life for males from respiratory diseases and gastro-intestinal diseases are respectively 3.09 and 2.7 percent. While for pediatric disorders and infectious & parasitic diseases they are 1.42 and 0.94 percent. The same picture is seen in the female values of probability of dying, where respiratory and gastro-intestinal values are respectively 2.81 and 3.05 percent, compared with values for pediatric disorders and infectious and parasitic diseases of 1.58 and 1.02 percent.

The poverty of Albanian society in the fifties is also associated with the lack of medical treatment, medical personnel, and poor living conditions. These are all factors that can explain a high number of deaths from bronchitis and influenza during the fifties in Albania. However, it might be possible, as in many other countries, that this category is used as a "safe" category for the undiagnosed deaths. Even if one takes this fact into account, still the high value of respiratory diseases compared to other causes of death, suggests that respiratory diseases have been and remain a major causes of death. This argument is also supported by the extremely poor living conditions in today's Albania, which may be of great significance for high rates of deaths from respiratory even in the eighties. In 1968, the rates of deaths from respiratory diseases go up to 4.42 for males and 4.78 for females. This increase is also found in other categories, such as pediatric disorders, cancers and cardiovascular diseases. It is believed that this increase is a result of an improvement in the diagnostic system coming from the increase in the number of doctors and medical personnel throughout the country. This increase is also reflected in certain causes of deaths even among adult mortality, which will be dealt with later on in this section.

A further interesting point to note in Table 5.4, is that deaths from gastro-intestinal diseases are very high in Albania, not just during the fifties but throughout the period from 1957 to 1987. This category is inflated as a result of the large number of deaths among infants caused by dyspepsia. Dyspepsia was a major killer in the fifties and sixties, and it still remains so in the eighties, although it has gone down from 2.7 to 0.91 percent for males and 3.05 to 0.79 percent for females. The occurrence of deaths from this disease is closely related to the quality of food for infants, and especially with the hygiene in general and food hygiene in particular. The quality of food for infants has been and is still poor in Albania, especially because of the lack of the processed food for infants. Apart from that, the hygiene of food is very poor, in particular in the rural areas, where the number of deaths from this cause are very high compared with urban areas. One further contributing factor to the high deaths from this disease is the low education of mothers in the fifties and sixties, which had a direct

effect in the children's nutrition.

Deaths from pediatric disorders are high in Albania for both sexes throughout the whole period. In 1957 they occupied the third position of all causes of deaths and they remain in that position in the eighties. Thus, in 1957 the probability of dying for males was 1.42 and for females 1.58 percent, while in 1987 it was respectively 0.75 and 0.68 percent. With the high values of the infant mortality in Albania during the whole period, one can expect a high value of deaths from pediatric disorders. The reasons that explain the high values for this cause of death for infants are similar to those explaining the high deaths from dyspepsia, and respiratory diseases: the lack of specialised personnel, the widespread poverty which is also reflected at the lack of treatments in hospitals and maternal centers, and so on.

Infectious and parasitic diseases, are also relatively high in Albania. Thus, in 1957 the value of ${}_1q_0$ was 0.94 for males and 1.02 percent for females. What is interesting regarding deaths from infectious and parasitic diseases is that they decrease during the period up to the end of seventies and then, a slight increase is noted at the end of eighties. This increase is also found for adults at the end of eighties. It is believed that with the stagnation of the Albanian economy in the eighties, and the widespread poverty, especially at the end of the eighties, all aspects of life were affected. In particular the lack of food, and the lack and poor quality of drinking water affected the nutrition and hygiene status at infants. This increased the infectious and parasitic diseases in general, and the number of hepatitis cases increased in particular.

Tuberculosis was relatively high among infants in fifties, but had almost disappeared by the seventies, and in 1987 there are no cases of infants dying from tuberculosis of any kinds. Cardiovascular diseases, as one might expect, are very low during the whole period. Although, cancers increase, probably as a result of better diagnosis, their occurrence is still low among infants.

When mortality at ages 1-4 is considered, almost the same picture as the cause-specific mortality among infants is found. Thus, in 1957 the major causes of death among children were respiratory and gastro-intestinal diseases, with respectively a net probability of dying of 2.5 and 1.57 percent for males and 2.83 and 2.35 percent for females. The only difference from infant mortality here is that the position of pediatric disorders is occupied by infectious and parasitic diseases. This is understandable because pediatric disorders are especially high immediately after birth, affecting consequently, the mortality of infants. Although, not as distinctive as in the case of infant mortality, the increase in deaths caused by infectious and parasitic diseases in the eighties is also evident for

child mortality. Thus, the values of ${}_4q_1$ in 1987 increased to 0.05 for males and 0.04 percent for females compared to 0.03 percent for both sexes in 1978. Tuberculosis disappeared for both sexes in the seventies, while cardiovascular diseases and cancers are also very low.

One very distinctive fact that is clear when infant and child mortality is considered in the fifties and sixties, is that the net probabilities of dying in general for the main diseases are higher for females than for males. If we refer to Chapter 4, during the first two decades, when high infant and child mortality for females compared to males was present, then this sex differential by cause is to be expected. As explained in Chapter 4, this was due to the relative advantage of male infants and children compared with females in terms of care and nutrition in the Albanian society of the fifties and sixties.

Concluding the analysis for infant and child mortality, it can be said that the major causes of deaths have been and still remain respiratory and gastro-intestinal diseases. Pediatric disorders and infectious and parasitic diseases, despite improvement during the period 1957-1987, are still high when compared to levels in other European countries. Tuberculosis which was a major killer in pre- and post- War Albania has completely disappeared in the eighties among infants and children, while cardiovascular diseases and cancers are very low throughout the period. In general it can be said that the cause-specific pattern of mortality among infants and children in Albania, despite the positive improvements during the period under consideration, still reflects the poverty of the circumstances of Albanian day-to-day life.

For adult mortality, the values of the net probability of dying for ages 15-60 were calculated for different causes of deaths. These values are given in Table 5.5 together with values of probability of dying for ages 5-15, which give an insight into later-childhood mortality.

Looking first, at the levels of probability of dying at ages 5-15, it can be seen that as with all human populations, mortality at these ages is very low compared with both infant and child mortality, and adult mortality. Thus, in 1957, ${}_{10}q_5$ for males was 1.83 percent and for females 1.77, while ${}_1q_0$ was 10.06 and 10.61 percent, and ${}_{45}q_{15}$ was 23.75 and 19.89 percent, respectively. Nevertheless, for completeness it is worth noting the major causes of death at these ages.

Table 5.5 Net probability of dying in % for ages 5-15 and 15-60, by cause of death

a. Male in%

Causes of death	1957		1968		1978		1987	
	$_{10}q_5$	$_{45}q_{15}$	$_{10}q_5$	$_{45}q_{15}$	$_{10}q_5$	$_{45}q_{15}$	$_{10}q_5$	$_{45}q_{15}$
1. Tuberculosis	0.13	4.47	0.01	1.43	0.00	0.51	0.01	0.10
2. Infect. & Parasit.	0.22	0.78	0.14	0.51	0.04	0.03	0.01	0.20
3. Cardiovascular	0.17	4.25	0.11	3.45	0.03	2.35	0.05	4.05
4. Respiratory	0.40	2.88	0.07	1.37	0.11	1.92	0.05	0.63
5. Cancers	0.01	1.90	0.04	5.73	0.09	4.29	0.05	3.50
6. Gastro-Intestinal	0.12	2.03	0.04	1.72	0.02	0.94	0.02	0.71
7. Others	0.78	7.44	0.46	4.32	0.35	4.73	0.41	4.48
All causes	1.83	23.75	0.87	18.53	0.64	14.77	0.66	13.67

b. Female in%

Causes of death	1957		1968		1978		1987	
	$_{10}q_5$	$_{45}q_{15}$	$_{10}q_5$	$_{45}q_{15}$	$_{10}q_5$	$_{45}q_{15}$	$_{10}q_5$	$_{45}q_{15}$
1. Tuberculosis	0.21	3.90	0.03	0.94	0.00	0.20	0.00	0.00
2. Infect. & Parasit.	0.31	1.05	0.08	0.42	0.03	0.05	0.02	0.21
3. Cardiovascular	0.07	3.90	0.09	2.56	0.03	1.45	0.05	2.52
4. Respiratory	0.64	3.07	0.12	1.19	0.10	0.94	0.04	0.22
5. Cancers	0.00	1.54	0.06	2.40	0.11	2.18	0.03	1.86
6. Gastro-Intestinal	0.08	0.87	0.05	0.64	0.03	0.39	0.01	0.27
7. Others	0.46	5.56	0.30	2.67	0.17	2.98	0.21	2.34
All causes	1.77	19.89	0.73	10.82	0.47	8.19	0.36	7.42

Compared with infant and child mortality, the pattern of diseases here changes. Respiratory diseases still remains the major cause of death, while gastro-intestinal diseases are one of the lowest categories. Cancers and cardiovascular diseases are still low at these ages during the whole period. Infectious and parasitic diseases (including tuberculosis) are relatively high compared to other categories, especially in the fifties and sixties. Later on, in the seventies and eighties, tuberculosis disappears and other infectious and parasitic diseases also go down.

Chapter 4 explained that one of the distinctive figures of adult mortality is that it was very low in Albania. Moreover, in a period of forty years it was reduced by half. Table 5.5 confirms this conclusion with $_{45}q_{15}$ improving from 23.75 to 13.67 percent for males, and from 26.83 to 11.67 percent for females. Moreover, Table 5.5 shows that it is not just adult mortality that has improved with time, but also its cause-specific pattern. Thus, in fifties the major killers among adults were

tuberculosis, respiratory and cardiovascular diseases, while in the eighties the place of tuberculosis and respiratory diseases is taken by cancers.

In 1957 the values of ${}_{45}q_{15}$ show that tuberculosis was the major cause of death for both sexes with 4.47 percent for males and 3.90 for females. As was described in Section 5.2, Albania had long had a high prevalence of tuberculosis. It is also known that tuberculosis is more common among adults. While tuberculosis is high at the end of fifties, infectious and parasitic diseases were not at the same rate. This is related to the efforts of the government in collaboration with different international organisations to reduce the effects of infectious diseases, especially malaria, immediately after the War.

The other major cause of death in the fifties was cardiovascular disease, with a probability of dying of about 4.25 percent for males and 3.90 for females. The number of deaths from cancers was low, 1.90 percent for males and 1.54 for females. As explained when infant and child mortality were analysed, this is likely to be more a case of difficulties in diagnosing the cancers then a case of very low rate. This argument is supported by the fact that deaths from cancers increased in the sixties, and after that, either were constant or declined.

It is interesting to see that, as with infant and child mortality, respiratory diseases were one of the major causes of deaths in the fifties. This is also explained by the same argument: the poverty of the circumstances of Albanians after World War II. While for infants and children respiratory diseases remain high at the end of eighties, they decreased among adults. This is probably explained by the fact that adults are more immune than children to respiratory diseases. In contrast to infant and child mortality, gastro-intestinal diseases are relatively low among adults in Albania, not just in the fifties, but also during the remaining period. Again acquired immunity may be the explanation.

Most of the improvement from deaths caused by tuberculosis happened during the sixties. Thus, from 1957 to 1968 the probability of dying from tuberculosis decreased from 4.47 to 1.43 percent for males, and 3.90 to 0.94 percent for females. This is a dramatic change in a relatively short period of 11 years. This reduction can be explained by the measures applied by the Albanian Government to bring tuberculosis down at the end of fifties and beginning of sixties. A programme of different measures was introduced during this period. A massive compulsory screening campaign for the whole population started at the beginning of sixties. All children were vaccinated, while people that were found to have the bacteria were put under intensive medical treatment. A large number of centres for tuberculosis treatment were established all over the country. As a result in the seventies,

deaths from tuberculosis continued to decrease, though it was only in the eighties that they virtually disappeared.

While tuberculosis was largely eliminated as a cause of mortality, its place was taken by cancers. In 1968 cancers were the main cause of death among adult males, with a probability of dying of 5.73 percent. In the seventies and eighties they declined, but still remained one of the major causes of death in Albania. Thus, in 1987 the probability of dying for males is 3.50 and for females 1.86 percent. It is clear from table 5.5 that for both sexes in 1987 cancers occupy the second place in the hierarchy of adult death composition in Albania.

One very significant point regarding adult cancer mortality is that there is a large difference between the probability of dying from cancers for males and females. The male value is nearly double that for female. There are two possible explanations for this sex difference. First, lung cancer among males is high in Albania (in 1978 the lung cancer for males was 3.8 times higher than females, and among males it accounts for 31% of all deaths from cancers), probably as a result of smoking[7]. This increased the rate of cancers among men, while on the other side, breast cancer is very low among females in Albania. Again this is related to smoking pattern in Albania. It is important to mention here that by being a traditional society, smoking is common among men and rare among women in Albania. However, even among men smoking starts at a relatively old age, over 20 years old (Gjonca & Bobak, 1997, p. 1817).

Another very distinctive point coming out of Table 5.5 with regard to adult mortality in Albania is that, unlike male adult mortality in some East European countries male mortality in Albania did not worsen in the eighties. On the contrary, looking at the data of Table 5.5 in this section and Table 4.1 in Chapter 4, it is clear that adult mortality slightly improved in the eighties for both sexes. However, this does not necessarily imply that Albania was excluded from East European experience of health crisis, as some other scholars have noted (Watson, 1995, p. 928).

Table 5.5 shows that the rate of cardiovascular disease has worsened in Albania for both males and females, from 2.35 to 4.05 percent for males, and from 1.45 to 2.52 percent for females. Nevertheless, one particularity of the Albanian case can be seen in the fact that this increase has occurred for both sexes, and not just among males, as in other Eastern European countries (Bobak, and Marmot, 1996). One further difference when male mortality is compared to other East European

[7]There are no individual data that relate smoking and cancer in Albania. Even more, the data on aggregate level on the smoking are lacking for the period under consideration.

countries is that the suicide rate in Albania is almost negligible. This difference and the fact that the increase in deaths from cardiovascular diseases occurred for both sexes, implies that in order to explain this phenomenon in Albania, one should look for other reasons than stress or alcohol as suggested by other scholars (Watson, 1995, p. 928-9). This controversial issue will be further discussed in Chapter 7, when some comparisons with other European countries will be analysed.

So far, with regard to adult mortality it can be said that cause-specific pattern in Albania has changed over time. From a pattern where tuberculosis and respiratory diseases have been the major killers, in a period of 40 years, it has moved to a pattern where the major causes of death are cancers and cardiovascular diseases, as can be found in most European countries today. To a certain degree the changes of the cause specific pattern in Albania show the changes of Albanian society from an undeveloped country to a more developed one, at least in terms of health transition.

Finally, the picture of the cause specific mortality pattern would not be complete if mortality at old ages were not considered. This is not an easy task for countries with problematic data on elderly people. In particular it is difficult to analyse the trends, if the reliability of age reporting of old people has changed over time. Despite this problem, it was considered appropriate to look at cause specific pattern among ages 60-70, as being less problematic ages than for ages over 70 years. Table 5.6 gives the probability of dying for this age group by causes of death for males and females separately.

Table 5.6 Net probability of dying in % for ages 60-70, by cause of death and sex.

in%

Causes of death	1957		1968		1978		1987	
	Male	Fem.	Male	Fem.	Male	Fem.	Male	Fem.
1. Tuberculosis	1.19	0.44	1.04	0.24	0.39	0.07	0.09	0.03
2. Infect. & Parasit.	0.32	0.25	0.39	0.09	0.08	0.00	0.25	0.07
3. Cardiovascular	4.12	3.53	7.76	5.68	7.01	4.21	11.98	6.33
4. Respiratory	2.09	1.72	4.68	2.45	5.74	3.31	2.76	1.25
5. Cancers	1.16	0.58	6.03	2.21	6.56	1.83	4.46	1.05
6. "Old Age"	13.44	10.97	4.55	3.68	1.25	1.44	0.00	0.00
7. Gastro-Intestinal	0.90	0.30	1.51	0.54	1.30	0.55	0.79	0.39
8. Others	3.61	2.90	3.73	2.09	6.34	3.48	5.08	2.55
All causes	26.83	20.69	29.69	16.98	28.67	14.89	25.41	11.67

The first thing that attracts attention is the category of "old age", which was high compared to other categories. Thus, in 1957 the probability of dying between ages 60 and 70 from this "cause" was

13.44 percent for males and 10.97 for females. These values are three times larger than the next value of probability of dying from cardiovascular diseases, respectively 4.12 percent for males and 3.53 percent for females. This shows again, as previously mentioned in Section 5.11 of this chapter, that this category was used as a "safe" category for undiagnosed deaths among elderly people. The fact that deaths from this "cause" decreased dramatically in the sixties and seventies, and in the eighties completely disappeared, supports this argument.

As is to be expected, the main causes of death at these ages are cardiovascular diseases, with 4.12 and 3.53 percent for males and females in 1957, reaching 11.98 and 6.33 percent in 1987. It is clear that the death rate from cardiovascular diseases has increased for both sexes, which shows that either the deaths from cardiovascular causes have increased, or the diagnosis has improved with time. If mortality from cardiovascular diseases has increased for ages 60-70, then an increase of mortality in general at these ages may be expected, because it is known that cardiovascular diseases are the major cause of death at these ages. Thus, the only remaining explanation is that diagnosis has improved for all causes and in particular for cardiovascular diseases. The same picture is given from the rates from cancers, which move from 1.16 percent for males and 0.58 for females in 1957 to 6.03 and 2.21 percent in 1968. A slow decrease is shown for deaths from cancers in the eighties with the probability of dying moving from 6.56 for males and 1.83 for females in 1978 to 4.46 and 1.05 percent in 1987.

The sex difference in mortality caused by cancers seems more pronounced for ages 60-70. Apart from the two explanations given above for adult ages, which also apply here, another possibility is a high rate of prostate cancer, affecting only men, and which has its peak at these ages.

Respiratory diseases have been and are still high at these ages, as expected from our earlier analysis. The elderly like children in that they are more at risk compared with adults when respiratory diseases are considered. This is because of the progressive weakening of the immune system later in life. Rates for infectious and parasitic diseases increased in the eighties among old ages, similar to those of young ages.

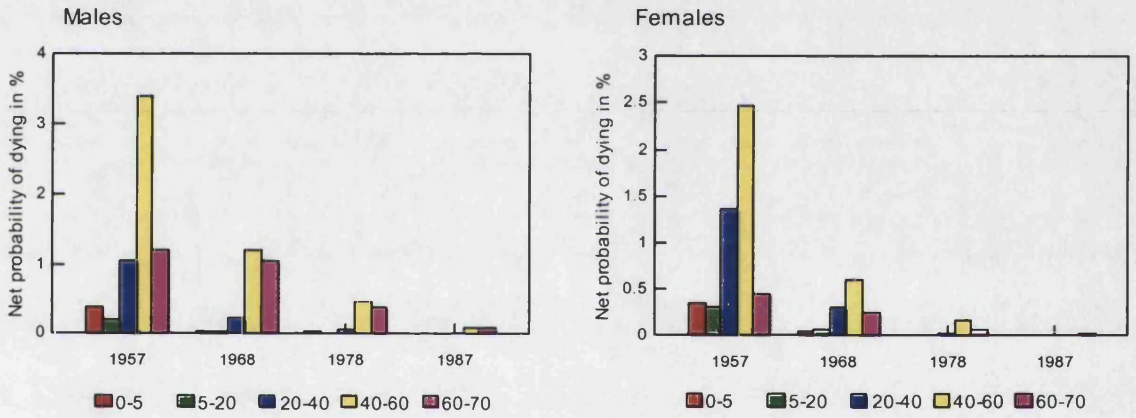
5.41 Analysis of cause specific mortality by cause.

In the previous section, the mortality pattern was analysed focusing on the variation of different causes of death by age. In this section, the cause specific pattern of mortality will be analysed

focusing on the variation of mortality at different ages within the same cause. Not all the causes of mortality will be analysed in this section. Only four major diseases will be considered: tuberculosis, cardiovascular diseases, respiratory diseases, and cancers. Even when age is considered, only the ages that are mainly affected by these diseases will be analysed, e.g. when the cardiovascular diseases are analysed, the probability of dying at ages 30-40, 40-50, 50-60 and 60-70 are considered.

Figure 5.2 gives the values of net probability of dying from tuberculosis, separately for males and females. The age groups chosen are the ones influenced more from tuberculosis. The choice was also based on the different immune systems among people at these ages.

Figure 5.2 Net probability of dying for selected age groups for deaths caused by tuberculosis.



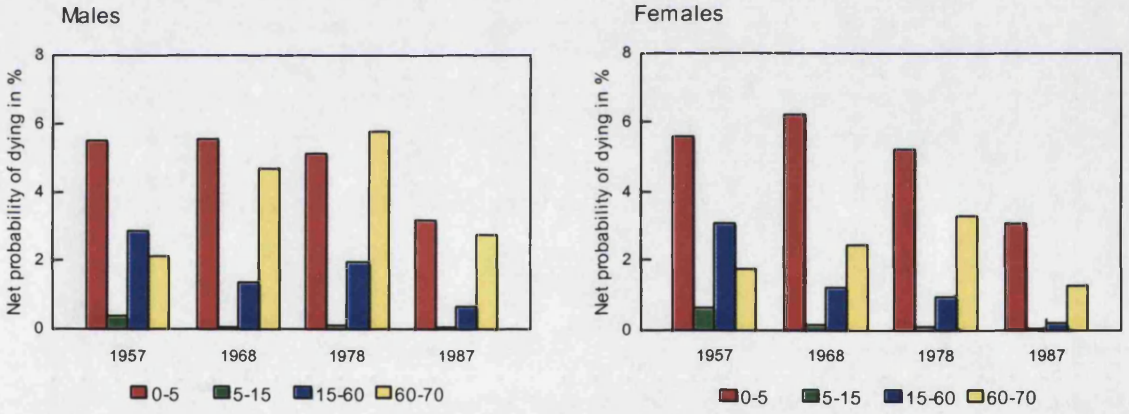
It is clear from Figure 5.2 that tuberculosis has mostly affected adults, especially ages 40-60. This is true at all years except 1987, by which time the disease was negligible. This is most evident for 1957, when tuberculosis was a major cause of death among these ages. For both sexes the values of probability of dying in this ages group are more than doubled compared to ages 20-40 and also 60-70. Figure 5.2 also shows that the rates of tuberculosis decreased rapidly for all ages and both sexes, especially in the first two decades. In the eighties tuberculosis has almost disappeared for all ages.

It is interesting to note that tuberculosis has been rare for ages 5-20, and apart from 1957, it has been very low, also for children aged 0-5. Ages 60-70 are also highly affected by tuberculosis in Albania, and at these ages tuberculosis decreased at a slower pace. This is relatively common as tuberculosis takes a long time to develop as a cause of death.

Regarding sex differentials in death rates caused by tuberculosis, it is clear that both males and females show very similar patterns. The only notable difference that one can detect is that for ages over 40, mortality from tuberculosis is higher among males than females. While at the younger ages, the opposite is true, mortality from tuberculosis of all kinds is higher among females. This sex differential among the very young ages can again be explained by the general pattern of sex differentials existing in Albania during fifties and sixties in terms of care and nutrition. Both those factors are important when tuberculosis is considered.

The same age classification used for the analysis of tuberculosis is applied for respiratory diseases. The only difference here is that adult ages are presented as one group from age 15 to 60. Figure 5.3 gives the probability of dying from respiratory diseases for both sexes 1957-1987.

Figure 5.3 Net probability of dying for selected age groups for deaths caused by respiratory diseases.



The first thing that attracts attention in Figure 5.3 is that compared to deaths caused by tuberculosis, the mortality improvement from respiratory diseases is not dramatic, and the pattern of change differs from one age group to another. Thus, for children 0-5 years old, nothing dramatic happens until the eighties for both sexes. Only then did a significant reduction take place, when the probability of dying decreases from 5.1 in 1978 to 3.2 percent in 1987 for males, and from 5.2 to 3.1 percent for females.

Children are the most affected from deaths from respiratory diseases. Apart from children, elderly people are also badly affected by these diseases, while adults are less affected. As previously explained, this could be due to a stronger immune system among adults, compared with children and

old people. Similar to the analysis of deaths caused by tuberculosis, the young ages, 5-15, are least affected of all other age-groups.

The probability of dying from respiratory diseases between ages 60-70 increases dramatically from 1957 to 1978 for both sexes. Thus, in 1957 ${}_{10}q_{60}$ was 2.1 percent for males and 1.7 for females, while in 1978 it goes up to 5.74 percent for males and 3.3 for females. Another look at Table 5.6 shows clearly that in 1957 the major "cause" of death was the catch-all category "old age", and this category goes down rapidly with the improvement of the diagnosis system. So, its decrease implies an increase at other categories, such as respiratory diseases. That is why it is not likely that this increase of probability of dying from respiratory diseases among 60-70 years old is not genuine, but rather an artefact of the improvement in disease diagnosis.

With regard to sex differences in mortality caused by respiratory diseases, there are a couple of points to be emphasised. First, as with tuberculosis, for very young ages mortality from respiratory diseases is higher among females than males. The same explanations given for tuberculosis can also be applied here. Respiratory diseases, like tuberculosis, are very sensitive to care and nutrition for children. It is only in the eighties that this sex difference among children almost disappears, with the probability of dying from respiratory causes being 3.2 percent for males and 3.1 percent for females. The other significant point regarding sex differences in Figure 5.3 concerns ages 60-70. During the whole period mortality from respiratory diseases, as one would expect, has been higher among males than females. Regarding the other ages, there is not any distinctive male-female difference to be noted in Figure 5.3.

Variation of mortality by age for cardiovascular diseases is given in Table 5.7. As previously mentioned, only adult ages are considered in this analysis, starting from age of 30.

As expected mortality from cardiovascular diseases gets worse with age, and this is so for the whole period. For ages 30-60 mortality improves in almost all years from 1957 to 1978 for both sexes. The only exception is the increase of mortality for males from 1957 to 1968 for ages 30-40. The probability of dying for these ages for males in 1957 was 0.209 percent, while in 1968 it was 0.307 percent. It is understandable that parallel to the improvements in the health care system, mortality from cardiovascular diseases improves, too. However, what it is interesting in the Albanian case is that mortality at ages 60-70, instead of improving or at least staying at the same levels, increased with time. Thus, in 1957 the probability of dying from cardiovascular diseases was 4.126 percent for males and 3.532 for females, while in 1987 it increases to 11.986 percent for males and 6.335 for

females. As previously explained this is not a case of a negative change in cardiovascular mortality at ages 60-70. Rather it is a case of improvements in disease diagnosis. If we look again at Table 5.6, and compare both values of mortality from "old age" and from cardiovascular diseases, it is clear that for both sexes while the "old age" category decreases, the cardiovascular one increases.

Table 5.7 Net probability of dying in different age groups for deaths caused by cardiovascular diseases.

a. Male in %

	1957	1968	1978	1987
${}_{10}q_{30}$	0.209	0.307	0.172	0.196
${}_{10}q_{40}$	0.943	0.713	0.479	0.819
${}_{10}q_{50}$	2.806	2.232	1.615	2.939
${}_{10}q_{60}$	4.126	7.764	7.012	11.986

b. Female in %

	1957	1968	1978	1987
${}_{10}q_{30}$	0.575	0.331	0.190	0.190
${}_{10}q_{40}$	0.783	0.558	0.340	0.485
${}_{10}q_{50}$	2.176	1.447	0.831	1.722
${}_{10}q_{60}$	3.532	5.680	4.219	6.335

The other distinctive point shown by Table 5.7 is that during 1978-1987 mortality gets worse at all ages for both sexes. The largest increase is for age group 50-60 years, where the probability of dying from cardiovascular diseases almost doubled from 1978 to 1987. Thus, for males it increased from 1.615 to 2.939 percent, and for females from 0.831 to 1.722 percent. The reasons for this worsening, as given in the previous section are to be found in the deterioration of the health system, and will be also analysed in more detail in Chapter 7, when a comparison with other European countries will be considered.

Table 5.8 shows the changes of mortality pattern from cancers in the same period 1957-1987. Similar to the analysis of cardiovascular diseases, mortality over 40 years old, where the incidence of cancers is higher, is seen in more detail, in age groups of 10 years. With regard to mortality before age of 40, ages are grouped from 0-20 years, and from 20-40 years.

Table 5.8 Net probability of dying in different age groups for deaths caused by cancers

a. Male in %

	1957	1968	1978	1987
$_{20}q_0$	0.043	0.140	0.299	0.230
$_{20}q_{20}$	0.083	0.543	0.440	0.347
$_{10}q_{40}$	0.496	1.144	0.982	0.751
$_{10}q_{50}$	1.321	4.074	2.872	2.398
$_{10}q_{60}$	1.160	6.033	6.564	4.462

b. Female in %

	1957	1968	1978	1987
$_{20}q_0$	0.013	0.171	0.313	0.176
$_{20}q_{20}$	0.155	0.365	0.416	0.314
$_{10}q_{40}$	0.448	0.533	0.552	0.417
$_{10}q_{50}$	0.946	1.481	1.192	1.109
$_{10}q_{60}$	0.583	2.212	1.833	1.052

It is clear from Table 5.8 that most of the deaths from cancers occur over age of 40 for males and 50 for females. As previously explained this is related to the peak of occurrence for different types of cancers among males and females. The peak of occurrence of lung cancers among males in Albania is at ages 50 to 60. Thus, the relatively high rate of lung cancers for males compared with females creates a high probability of dying at these ages. In 1978 and 1987 for males aged 50-60 years, the probability of dying from cancers was 2.872 and 2.398 percent compared with with 1.192 and 1.109 percent for females. Thus, the rate for males is more than twice that for females. There is also a sex difference for ages 40-50. The probability of dying at these ages for males in 1978 and 1987 is 0.982 and 0.751 percent compared with 0.552 and 0.417 percent for females. This difference is believed to be influenced by the low rate of breast cancers in women, which in the Albanian case have their peak of occurrence at ages 40-50. While the difference among ages 60-70 is explained earlier in this chapter, because of the high rate of prostate cancers at males. That is why in this age group the sex difference is more pronounced compared with the other age groups.

Regarding mortality from cancers in the earlier ages, the rates are very low. Another distinctive point to be mentioned here is that the probability of dying from cancers increases in the first three decades, which, as mentioned above is caused because of the improvements in diagnosis system.

5.5 CONTRIBUTION OF DIFFERENT CAUSES OF DEATH TO CHANGES IN OVERALL MORTALITY.

When mortality patterns were analysed in chapter 4, among other things, changes in life expectancy at birth were decomposed to reveal the contribution of different ages to this change. A more detailed analysis of life expectancy improvement is to analyse this improvement, not just by age contribution, but also by the contribution of each cause of death.

The contribution of different ages to changes of life expectancy, as given in chapter 4, were calculated by the following formula:

$$e_{o(2)} - e_{o(1)} = \int (\mu_{x(1)} - \mu_{x(2)})\ {}_xp_{o(1)} e_{o(1)}\, dx \qquad 5.1$$

where: $e_{o(2)}$ and $e_{o(1)}$ are the life expectancy at birth at time 2 and 1

$\mu_{x(1)}$ and $\mu_{x(2)}$ represent the force of mortality at age x at time 1 and 2

${}_xp_o$ probability of survival from age 0 to age x..

Pollard developed this formula to measure the contribution of different causes to changes of e_0 (Pollard, 1989, 1990). The number of deaths at age (x) is given by the sum of the deaths from each cause (j) at age (x). Consequently, the force of mortality μ_x at age (x) will be given by the sum of the forces of mortality for various causes at age x, which in symbols will be written as follows:

$$\mu_x = \sum \mu_x^{(j)} \qquad 5.2$$

For each cause "j", where $j \in (\alpha, \ldots\ldots, \lambda)$

Substituting formula 5.2 in equation 5.1 allows the calculation of $e_{o(2)} - e_{o(1)}$ not just by age, but also by cause of death. In this case the transformation is given by equation 5.3:

$$e_{o(2)} - e_{o(1)} = \sum_j \int (\mu^j_{x(1)} - \mu^j_{x(2)})\ {}_xp_{o(1)} e_{o(1)}\, dx \qquad 5.3$$

where again $j \in (\alpha, \ldots\ldots, \lambda)$

For numerical calculation the integral in equation 5.3 can be calculated based on the central death

rates ${}_nm^j_x$, for age (x) and cause (j). This approximation is given in the following equation:

$$
\begin{aligned}
e_{o(2)} - e_{o(1)} = \quad & \sum({}_1m^j_{0(1)} - {}_1m^j_{0(2)})w_0 \\
& +4\sum({}_4m^j_{1(1)} - {}_4m^j_{1(2)})w_2 \\
& +5\sum({}_5m^j_{5(1)} - {}_5m^j_{5(2)})w_{7.5} \\
& +..... \quad .... \quad ... \qquad\qquad 5.4
\end{aligned}
$$

Where w_x is a weighted factor described in chapter 4 and given by formula 4.4.

In this analysis of cause specific contribution to changes in e_0, in order to get a better approximation, instead of using the central death rates in the above formula (5.4), a new variable is used - ${}_nQ^j_x$, by the following formula (Pollard, 1982, p.228):

$$
{}_nQ^j_x = -\ln\left(l^j_{x+n}/l^j_x\right) \qquad 5.5
$$

From then on the calculations are exactly the same as those given in Appendix B for the age-specific contribution to changes in e_0.The full results of the age-cause contribution to changes of life expectancy at birth are given in Appendix C. In the period 1957-1987, these calculations are divided into three parts, 1957-1968, 1968-1978 and 1978-1987. This division is based on the existence of life table values for causes of death in these years, without which such calculations would be impossible.

Causes of death used in these analyses are grouped in the same categories as in the previous analysis. The results for all ages are given in Table 5.9.

As we can see, when all ages are considered, most of the improvement at life expectancy at birth for the whole period has come from improvements of deaths caused by infectious and parasitic diseases (including tuberculosis), accounting for 2.925 years, respiratory diseases, 2.531 years and gastro-intestinal diseases, 2.747 years. The negative values of the contribution for cancers and cardiovascular diseases suggest that for the period 1957-1987 as a whole, the influence of these two causes has been in worsening mortality in general. But, as it was explained in section 5.4 of this chapter this is unlikely to be true, because the increased rates of deaths for these two causes have been more an outcome of an improvement in the diagnostic system during the period under

consideration. This is also clear from Table 5.9. As one can see, the contribution to e_0 changes from cause "old age" is about 3.772, which is quite high compared to every other cause. But as we know, this cause was used as a "safe" category for undiagnosed deaths. With time, as the contribution from this category goes down, the influence of the other two categories, cancers and cardiovascular diseases increases. Thus, for the period as the whole if the negative contributions of these two categories are added up, they amount to approximately the positive contribution of the "old age" category. This suggests again that the undiagnosed deaths grouped in the "old age" category have been moved mainly to the categories of cancers and cardiovascular diseases.

Table 5.9 Contribution in years of different causes of death to the improvement of life expectancy at birth during 1957-1987.

in years

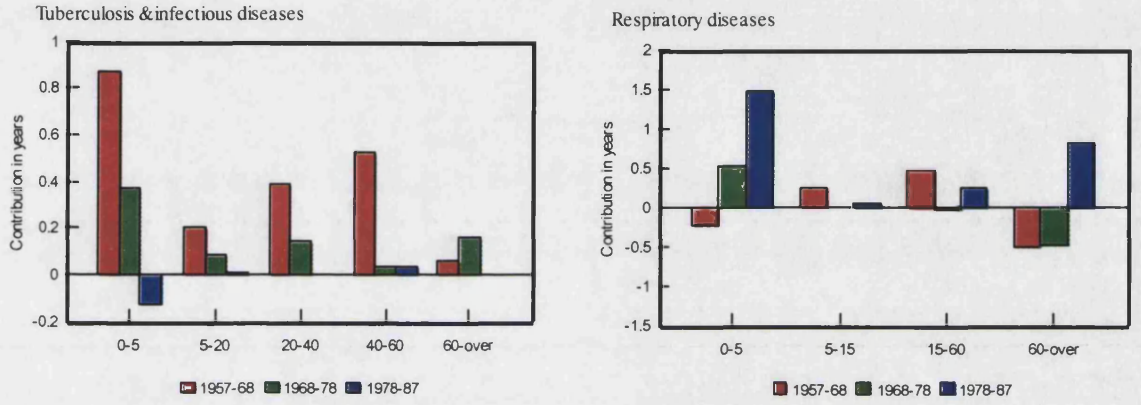
Causes of death	1957-1968	1968-1978	1978-1987	1957-1987
1. Tuberculosis of all kinds	1.157	0.371	0.149	1.677
2. Infectious & Parasitic diseases	0.883	0.594	-0.229	1.248
3. Cardiovascular Diseases	-0.623	0.541	-2.273	-2.355
4. Respiratory Diseases	-0.032	-0.004	2.567	2.531
5. Cancers	-1.486	0.162	0.426	-0.898
6. "Old Age"	2.428	0.758	0.586	3.772
7. Gastro-intestinal Diseases	1.620	0.783	0.344	2.747
8. Pediatric Disorders	0.241	0.184	0.491	0.916
9. Other Diseases	2.523	-0.822	0.352	2.053
All Causes	6.711	2.567	2.413	11.691

There are two more distinctive points in Table 5.9. Both have to do with the 1978-1987 period. First, the contribution of infectious and parasitic diseases to life expectancy improvements during 1978-1987 is negative (with -0.229 years), implying that deaths from infectious and parasitic diseases during this period increased in Albania. As explained in Section 5.4 of this chapter, it is likely that this is true, especially for very young and old ages. The second point to note in this period is the very negative influence of cardiovascular diseases, by -2.273 years. In this period it is very unlikely that this was a case of improvements in diagnosing system, although that even this cannot be completely ruled out. However, it is believed that deaths from cardiovascular diseases in this period really increased in Albania, as they did in other East European countries at that time.

Table 5.9 gives only a general view of the contribution of various causes of deaths to changes in life expectancy at birth. A more detailed analysis by cause and age is required to complete the picture of the analysis of cause specific mortality. The values of contribution by age and cause are given in

Appendix C. However, in this section we focus on the contribution of some of the main causes of death in different age-groups. Figure 5.4 gives the contribution to changes of life expectancy at birth from improvements in survivorship from tuberculosis and infectious diseases (taken together), and from respiratory diseases.

Figure 5.4 Contribution (in years) of tuberculosis & infectious diseases, and respiratory diseases to changes of life expectancy at birth, 1957-1987.



Looking at the contribution from tuberculosis and infectious and parasitic diseases, it is clear that most of the improvement occurred within the first decade 1957-1968. In this period life expectancy at birth improved by 2.04 years (or 30.4%) from improvements from tuberculosis and infectious diseases, in a total improvement of 6.711 years from all causes. Mortality from tuberculosis and infectious diseases has improved at all ages, but most of the improvement happened among infants and children, with about 1.117 years (or 40.5% of the improvement at all ages). Among adult ages, mortality from tuberculosis and infectious diseases also improved substantially. Thus, for ages 20-60 years, taken together, it improves by 1.124 years during 1957-1987.

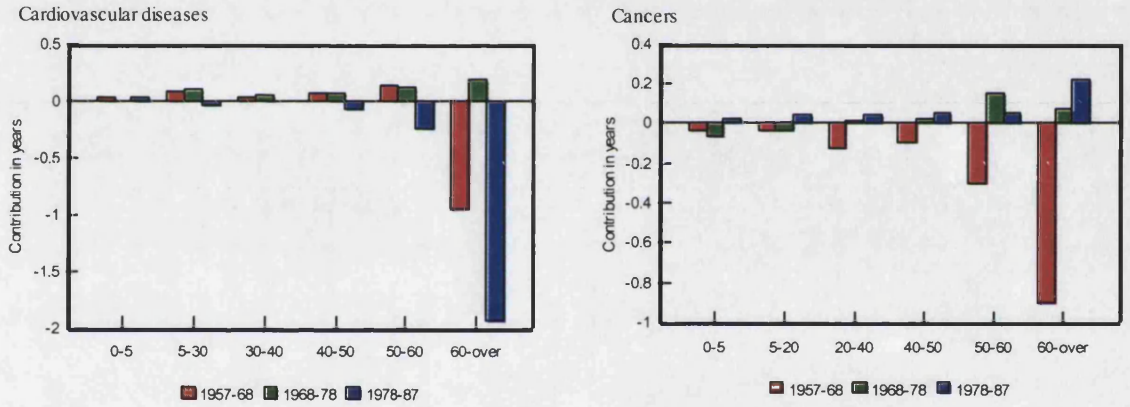
Figure 5.4 also supports the conclusion of the previous analysis that mortality caused by infectious and parasitic diseases increased in the eighties. As a result of that, a negative contribution is obtained in 1978-1987 period from infectious and parasitic diseases with about 0.08 years (about 1 month).

The graph on the right side of Figure 5.4 gives the contribution to changes of e_0 from respiratory diseases. As with tuberculosis and infectious diseases, most of the contribution here is positive, implying an increase in life expectancy at birth. However, the pattern of change here is different. Most of the improvements occurred among children. Thus, for ages 0-5 for the whole period, improvements in respiratory diseases increased e_0 by 1.748 years. While for ages over 60, in the first

two decades, the contribution of respiratory diseases is negative. In the last decade mortality caused by respiratory diseases improved by almost one year. The negative contribution in the first two decades is probably a case of improvement in the diagnosing system more than a case of increased mortality. During adult ages changes in mortality caused by respiratory diseases are not significant.

Figure 5.5 gives the contribution of two other causes of death to changes of life expectancy at birth: contribution of cardiovascular diseases and cancers. It is interesting to note that overall, both cancers and cardiovascular diseases have a negative contribution to changes of e_0, which as explained above might be a case of improvements in diagnosing system at old ages.

Figure 5.5 Contribution in years of cardiovascular diseases, and cancers to changes of life expectancy at birth, 1957-1987.



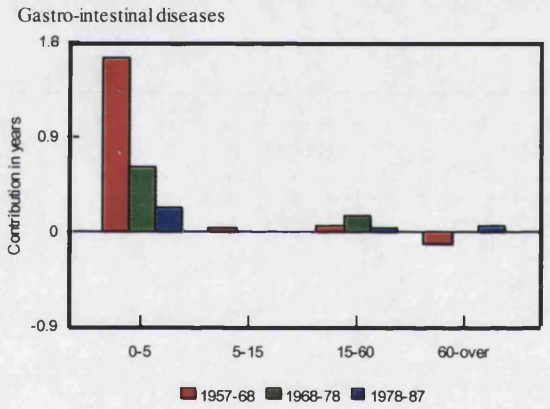
With regard to cardiovascular diseases, not much happens until the age of 50. The changes prior to age 50 are insignificant. Most of the changes have happened among those aged 60 and over (e.g. about 71.8 % of changes during 1978-1987). The only period that has a positive contribution to changes of e_0 is 1968-1978, although this change is not very significant (about 0.541 years for all ages). While for the last period, 1978-1987 the contribution is negative, with cardiovascular diseases decreasing life expectancy at birth by 2.273 years. As explained above, during the eighties mortality from cardiovascular diseases worsened. However, it must be said that this negative change must have been influenced by the improvement of diagnosing among old ages (it is not plausible that mortality from this cause over 60 years old got so much worse as to reduce e_0 by almost 2 years).

With regard to cancers, the most distinctive point is that there is a negative contribution at all ages during 1957-1968, about 1.5 years. The fact that most of this negative change within mortality from cancers happened at ages 60 and over, supports the argument that this is mainly a case of

improvement of the diagnostic system, and not just that mortality from cancers got worse at all ages during 1957-1968. For the two remaining decades, improvements in mortality from cancers contribute 0.588 years to changes of life expectancy at birth, which is not large but is detectable. It is interesting to find out that changes (or contributions) of mortality from cancers increase with age. This is understandable, because if the occurrence of cancers increases with age, this is how the changes can be expected to occur.

The last contribution to be analysed is the contribution of gastro-intestinal diseases to changes of life expectancy at birth. Figure 5.6 shows these contributions for the period 1957-1987.

Figure 5.6 Contribution in years of gastro-intestinal diseases to changes of life expectancy at birth, 1957-1987.



The first thing that attracts attention at Figure 5.6 is that the contribution of gastro-intestinal diseases is positive overall, increasing life expectancy at birth by 2.747 years. For ages 5 years and over, not much happens when mortality from gastro-intestinal diseases is considered. This is understandable because the occurrence of gastro-intestinal diseases in Albania has been relatively low at adult ages compared to infants and children. It is clear that most of the change happened among children. Thus, ages 0-5 contributed 2.473 years, or 90% of the contribution of all ages. Most of this happened within the first decade, 1957-1968, with 1.639 years, or 66.3% of the contribution for ages 0-5 during the whole period.

5.6 CONCLUDING NOTES.

Among other things, Chapter 4 concluded that despite the relative poverty existing in Albania at the end of the eighties, Albania achieved a high life expectancy at birth, exceeding 70 years. It also concluded that infant and child mortality was high in contrast with very low levels of adult mortality. Based on these findings, Chapter 5 has tried to focus on how the cause specific pattern reflects this

paradoxical situation. Following this line of thinking, the main findings of Chapter 5 are as follows:

In the period 1950-1990 the pattern of disease changed dramatically in Albania, with infectious diseases (in particular tuberculosis) and gastro-intestinal diseases dropping sharply, and their place being taken by cardiovascular diseases and cancers. This transition, although having a different timing, is similar of that experienced by other European countries at earlier dates. This change of cause-specific pattern also reflects the move of Albania from an undeveloped society into a more advanced one during this period.

Despite the changes in the pattern of diseases, there are some particular diseases which did not change very much during this period, reflecting the poverty of the standard of living in Albania. Thus, respiratory diseases remained high, not just in the sixties and seventies, but also in the eighties. This was true for all ages, but most of all for children and the elderly.

One other particular point on Albania is also the fact that deaths from homicide, violence and in general accidents were almost insignificant in Albania compared to other causes during 1950-1990.

It is interesting to note that changes in the cause-specific pattern also reflect changes in the social and economic aspects of Albanian society. Thus, during the eighties, which are known as the years when Albanian economy was stagnating, and the standard of living of Albanians declined dramatically, some particular causes of death, notably infectious diseases or diseases of affluence, which are influenced by these conditions, increased.

The high infant and child mortality found in Chapter 4 are explained here by the high rates of deaths from diseases of respiratory system, gastro-intestinal diseases (with particular reference to dyspepsia) as well as pediatric disorders. The high rates of these causes of death for children, in particular dyspepsia and respiratory diseases, also reflect the relative poverty of Albanian society.

Respiratory diseases were also found to be high among adults, reflecting the same factors as child mortality. How then, does it come that adult mortality is low in Albania? The answer to this question rests at the fact that the rates of death among adults from cardiovascular diseases and cancers are low in Albania.

With regard to old age mortality, despite the fact that cause-specific data for these ages are problematic (Doll & Peto, 1981), still they shed some light on the pattern changes of disease, with

cardiovascular diseases and cancers replacing the "old age" and respiratory diseases. However, a more clear-cut appraisal is impossible because of the way in which "old age" deaths were progressively better diagnosed.

Overall, it can be said that the paradoxical situation of age-specific Albanian mortality is also reflected in its cause-specific composition and changes. Moreover, as with the mortality trends, the cause specific changes reflect the social and economic changes of the country.

Chapter 6. REGIONAL DIFFERENCES IN MORTALITY

6.1 INTRODUCTION

Chapter 4 and 5 analysed mortality in Albania in two different aspects. Chapter 4 focused on the trends of mortality in Albania since 1950, and also on a detailed analysis of mortality patterns by age. In Chapter 5 mortality patterns were analysed, not just by age, but also by another component - the cause of death. Both these chapters looked at two dimensions of mortality, the cross-sectional one (analysing patterns by age and cause) and also the dynamics of mortality over time (analysing the trends, again by age and cause).

This Chapter looks at another important dimension of mortality; the spatial dimension, analysing mortality differences by region. The analysis by regional differences is important, not just to understand the changes of mortality during its transition between 1950 and 1990, but also as a mean to find the reasons for these changes.

When mortality was analysed by age, a paradoxical situation was found, with a high infant and child mortality present throughout the whole period, while adult mortality was very low once the main infectious diseases were eliminated. It is of great interest to see if this pattern can also be found in regional level, and if so, can the regional differences of mortality shed light to this phenomena?

As we have noted before one cannot see the mortality transition isolated from changes in the social and economic life of the country. Chapter 5 concluded that the changes in cause specific patterns reflected the social and economic changes in Albania during the period 1950-1990. Differences in social and economic factors are known to produce differences in mortality levels. It will be interesting to see if this is the case at regional differences of mortality in Albania.

In order to understand the reasons for regional mortality differences in Albania, it is first necessary to establish what regional differences exist in the country that might influence the mortality pattern. It will be of particular relevance to see if there are differences in the level of development between the districts. One way of looking at differences in development is to examine the level of urbanisation. Another aspect of development that affects mortality is education (Caldwell, 1986, p. 208). Thus educational differences are also considered as an element of development in the following analysis.

Figure 6.1 shows the regional differences of urbanisation, population density and the level of education in Albania. Map 1, which shows the different population density and urbanisation in the country refers to 1990, while Map 2, which shows the education differences refers to 1979. 1979 was taken because of the lack of published data on education by districts in the later years. This map shows the differences in the level of education among those who have completed seven years or more of schooling. The differences are measured as the 'variation' from the average national level.

6.11 Urbanisation.

Chapter 2 concluded that, despite the Government's efforts to industrialise the country, Albania still remained predominantly rural with the lowest level of urbanisation in Europe. This low level was present not just in the fifties, but also in the eighties, with a value of 36% (in 1990).

Looking at population density at Figure 6.1, it is clear that the area with the highest population concentration in the country is the central-western part of Albania. The districts with the highest population density (over 200 inhab/km^2) are Tirana (the capital), Durres and Fier. It is not by chance that these cities have the highest density. These districts together with Elbasan are the most industrialised regions of the country; 48.6 % of the total industrial production of the country was produced in these districts in 1990 (INSTAT, 1992, p. 171). It is also not by chance that these areas have the highest level of urbanisation, with Tirana 67.6%, Durres 49.8%, and Elbasan 40.6%, compared with the overall figure in 1990, which is about 36%. It is also worth mentioning that in the central-western part of the country (lowland Albania) is concentrated about half of the total population (in Durres, Tirane, Kruje, Elbasan, Fier, Lushnje and Berat). The less densely settled areas of the country are the north-east and the south-eastern parts of the country, which also have the lowest levels of urbanisation. The only exeptions in these parts of the country are Shkodra in the north and Korca in the south-east. Both these areas, which have similar level of urbanisation (respectively 34.9% and 34.4%), have historically been more developed than the other districts of their regions.

It is noteworthy that the most urban areas of the country are the coastal central districts (including Shkodra in the north and Vlora in the south). This is related to the fact that this area is the lowland Albania, with a more developed infrastructure, than the rest of the country which is mountainous and difficult to access.

Concluding on the regional differences of urbanisation, one can say that there is a marked difference in urbanisation in Albania, with the coastal-central part of the country more urban than the rest of the country. The only expectations are Korca in the south-east, and Shkodra in the north.

6.12 Education.

Chapter 2 concluded that, despite the rapid improvements in education at the national level within a very short period of time, regional divisions still exist between north-east and south-west of the country. Map 2 at Figure 6.1 shows these differences very clearly for 1979.

It is clear that the north-eastern districts have a lower level of education compared to national average, and the south-western ones have a higher level. Thus, southern districts like Vlora, Saranda and Gjirokastra score higher then the mountainous districts of northern Albania, such as Mat, Mirdite, Tropoje or Kukes. A high level of education is also found in very urban areas, such as Tirana and Korca.

To a certain degree, the different levels of education also relate to the different level of urbanisation in the country, with some exceptions. These exceptions arise because, as previously explained the most urban districts are concentrated in the central coastal part of the country. When it comes to education, there are some southern districts such as Saranda, Gjirokastra, and Kolonja, that do much better than even the most urban areas of the country. It is difficult to give a simple explanation. One possible reason for this pattern is that these areas, although not very urban, historically have had a better communication with countries such as Greece and Italy, which created better possibilities of schooling compared with the rest of Albania, and especially the isolated mountainous north of the country.

6.13 Topography

When the regional divisions in a country are considered one cannot ignore the divisions in the topography and climate of the country, which do not just determine the flora, but also have had major influences on the history, culture and social life of each region. This is particularly true for Albania, where the physical characteristics of the land have contributed to different living conditions and social relationships in various parts of the country (Keefe et al. 1970, p. 25).

Chapter 1 described the country as predominantly mountainous (about 70% of its territory). The major physical division in the country is between the lowland coast, and the highland north-east and south-east. However, this main division can further sub-divided in order to better understand the physical division of Albania. Figure 6.2 shows 5 major physical divisions of Albania, the Albanian Alps in the north, the Lowlands on the coast, the Central Uplands, the Southern Mountains, and the Serpentine Zone. This main division can also be sub-divided; e.g. the Upper Eastern Highlands and the Lower Eastern Highlands within the Serpentine Zone; or in the Southern Mountains can also be distinguished the Albanian Riviera and the Inner Southern Mountains.

The Albanian Alps consist of the mountains of far north Albania and are an extension of the Dinaric Alpine chain coming from the Montenegran plateau. They are deeply dissected by river gorges and rising to watershed ridges of around 2500 metres. The highest point here is Jezerca in Shkodra (2694 metres).

In Shkodra, where the Albanian Alps end, **the Lowlands** extend through the coastal belt down to Vlora. The plain is not more than 10 miles deep on average, but in Elbasan it extend to 30 miles. Until the fifties there were large areas of marshland and other areas of bare eroded badlands, which created conditions for widespread malaria in the area. The marshlands were mainly in the districts of Lezha, Lushnja and Fieri. As explained in Chapter 5 these marshlands were reclaimed and the whole coastal land was transformed into a highly fertile area. It is in this area that the main cities of Durres, Tirana, Elbasan, Vlore and Fier are to be found, dominating the country's economic life.

Where the southern lowland ends in Vlora, the **Southern Mountains** start, connecting Vlora with Elbasan and Korce. They have similar characteristics to the Albanian Alps, but they are more gentle and accessible than the rest of the mountainous area of the country. Transition to the lowlands is not as abrupt as in Shkodra from the northern Alps, and the valleys are arable. The existence of limestone contributes to the cliffs and clear water along Albanian Riviera in Vlora and Saranda. The highest points in this part of the country are in Vlora (2050 metres) and in Gjirokastra (2155 metres).

The Central Upland region extends south of the Drin River, which marks the boundary between the Albanian Alps and the Southern Mountains. It is an area of generally lower mountain terrain compared with high mountainous north and east of Albania, and is a transition between the lowland to the west and the highlands of the Serpentine Zone. However, the highest point in this zone is still high at 2417 metres in Berat.

The Serpentine Zone, in the west of Albania, extends almost the whole length of the country, from the Albanian Alps to the Southern Mountain border with Greece. It goes 10 to 20 miles deep in the country and is over 125 miles in length. It is called the Serpentine Zone because of the different serpentine rock formation of the mountains of this zone. In the north-east of this zone, the Eastern highlands, is located the highest point of the country at Diber (Korabi mountain), about 2751 metres. The Serpentine Zone, including the eastern highlands, and the Albanian Alps are the most rugged and inaccessible areas of the whole Balkan Peninsula.

6.14 Climate

It goes without saying, that this very different physical environment in such a small country, similar to the size of the Wales, has produced a very diverse climate. Chapter 1 described the two different climates existing in Albania, which reflect the physical terrain of the country. The coastal belt and Southern Mountains have a typically Mediterranean climate, while the Albanian Alps and Central and Eastern Uplands have a continental climate typical of the Balkan interior. In both the lowland and the interior regions weather varies a lot from south to north.

Table 6.1 shows these climate variation within the country according to the topographical zone. It is very clear that lowland Albania (districts of Durres, Lushnje, and partially Vlore and Shkoder) has a very mild winter and a relatively hot summer, typical of Mediterranean countries. The average annual temperature of these areas is higher than in the other parts of the country. What is also interesting about the lowland Albania, compared to internal highland of the country, is that the variation of temperatures during the year is low compared to highland Albania. Thus, the difference between the warmest and the coldest months in lowland Albania is about 17.5^{0}C. In north and eastern highland Albania is about 22.5^{0}C.

While lowland Albania has a typical Mediterranean climate, the north and eastern highlands have a more continental climate, with a very cold winter and a relatively hot summer. Winters are colder as a result of continental air masses that predominate over Eastern Europe and the Balkans. The temperatures in the winter go below zero, while in summer they are on average 4 degrees lower than in lowland Albania. The only exception in highland Albania is the southern highland, starting from the Albanian Riviera (Saranda and Vlora), which experienced Mediterranean conditions, although the high relief modifies these conditions. This modification is gradual from south to mid-Albania, and is most marked near Kruja.

Regarding climatic divisions in Albania, one can conclude that the lowland and the lower mountains of the south (south-west Albania) have a Mediterranean climate. While in the northern and eastern highland (north-east Albania) the weather is dominated by continental air masses that persist over central and Eastern Europe. In terms of Districts this division could be simplified by a straight line going from Shkodra to Permet.

6.15 The Plant-life

The distribution of plant-life of a region is controlled by factors including climate, topography and soil. In so mountainous a country, which is very diverse in terms of climate and topography, marked local vegetational and botanic variation is to be expected. Despite this variation it was concluded that there is a marked division of Mediterranean and continental (central European) climates. Similarly, the plant-life of the country includes areas of Mediterranean and continental vegetation. Coastal Albania is dominated by Mediterranean flora and evergreen hard-leaved vegetation. However, there is no sharp boundary between the Mediterranean and Central European climates, and the closer to inland Albania, Mediterranean plant-life gradually gives way to continental species. Regarding the coastal south, which is much rockier than the other coastal area, the Mediterranean communities are dominant everywhere. There are massive olive and citrus plantations similar to Greece or other Mediterranean countries. Most of the vineyards and vegetable cultivation is based in the coastal areas.

Highland Albania, being more continental in climate mostly has a central European plant-life. The only difference is in the extreme south, where Mediterranean influences make themselves felt. In the Albanian Alps, the flora on the whole is of a very central European nature. It continues to be like that in the central highlands, although that more one goes to the West, the more the Mediterranean influence is found.

6.16 Cultural Differences

The physical geography of Albania, to a certain degree, has contributed to the cultural division of the country into two main cultural groups, Gegs and Tosks, at least until the middle of this century. The Shkumbini river is the division between these two cultural groups. North of the Shkumbini river, mainly concentrated in the remote north-east of the country, Gegs have predominated. They are a distinguished group compared to the Tosks, characterised as 'Dinaric' in physical type, 'tall, convex-

nosed, long-faced', they are anthropologically similar to other mountainous people who extended as far north and west as Switzerland. Their traditional social life was organised on the basis of clan loyalty system (Hall, 1994, p.26), and even today, in some small areas, traces of this social organisation can be found.

South of the Shkumbini river, inhabiting the lowland and the basins of the southern mountains, the Tosks have been living a rather different social life than the Gegs. Up to the 18th Century, they had a similar type of organisation to the Gegs, based on a tribal hierarchy. However, this way of life changed later, through the traits of family organisation can be found until the beginning of this century. Environmental and cultural differences created a contrasting society to that of the north, yet one based on variations insufficient to eclipse the sense of a common Albanian national identity.

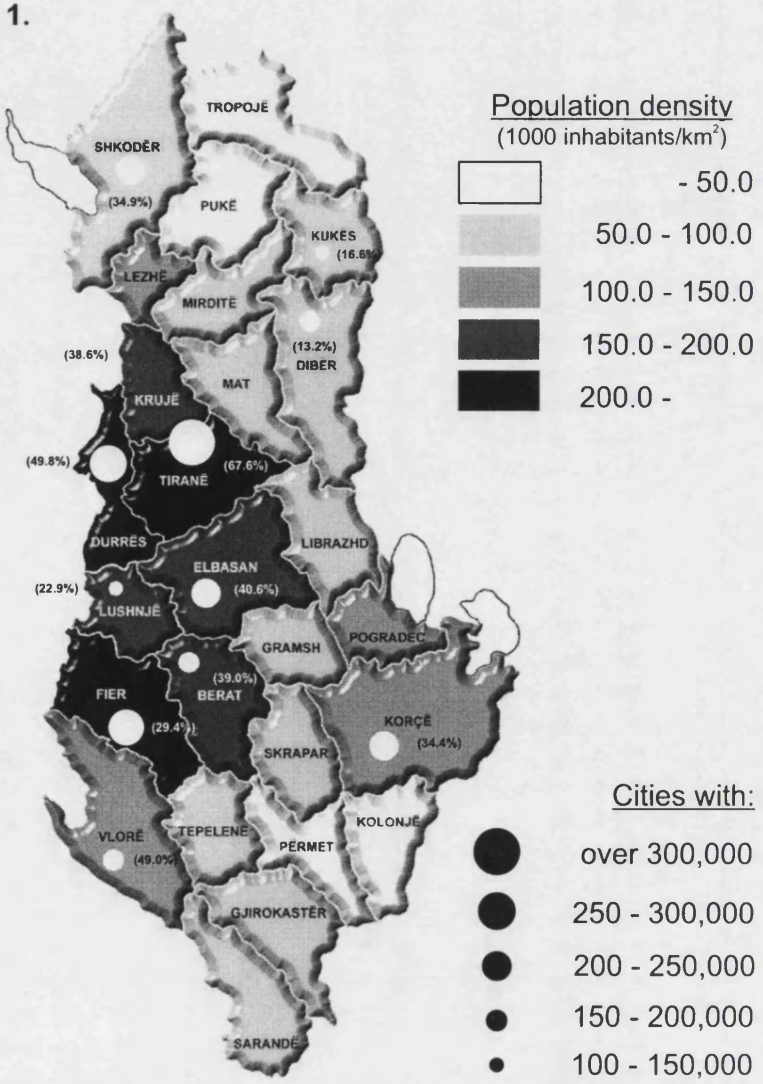
Table 6.1 Climate indicators of different locations in Albania

Districts	Location	Highest point (in metres)	Altitude above see level (in metres)	Average Temperature			Annual Precipitation 1980-1990 (in cm)	Clear Sunny Days
				Annual 1980-1990	Coldest month (1990)	Warmest months (1990)		
Diber	Upper Eastern Highlands	2751	656	11.22	-1.2	21.8	91	98
Kukes	Alb. Alps & Upper Eastern Highlands...	2487	257	12.25	0.0	23.5	82	85
Korce	Eastern Highlands	2288	869	10.49	-0.1	20.6	68	106
Shkoder	Alb. Alps & Northern Coastal	2694	16	15.08	4.8	26.5	158	143
Durres	Lowlands..	-----	2	16.26	8.1	24.3	84	153
Lushnje	Central Coastal Lowlands	-----	22	16.18	6.8	25.1	81	164
Berat	Central Coastal Lowlands	2417	59	15.90	6.4	25.5	75	164
Gjirok'er	Central Uplands	2155	400	14.45	3.9	24.7	158	166
Vlore	Southern Uplands	2045	6	16.25	7.9	24.7	82	166
Sarande	Southern Lowlands & Albanian Riviera.. Albanian Riviera	-----	3	15.60	7.2	22.9	115	189

Source: Statistical Yearbook of Albania, 1991.

Fig 6.1 Regional differences: urbanisation and education levels

Map 1.



Population density
(1000 inhabitants/km²)

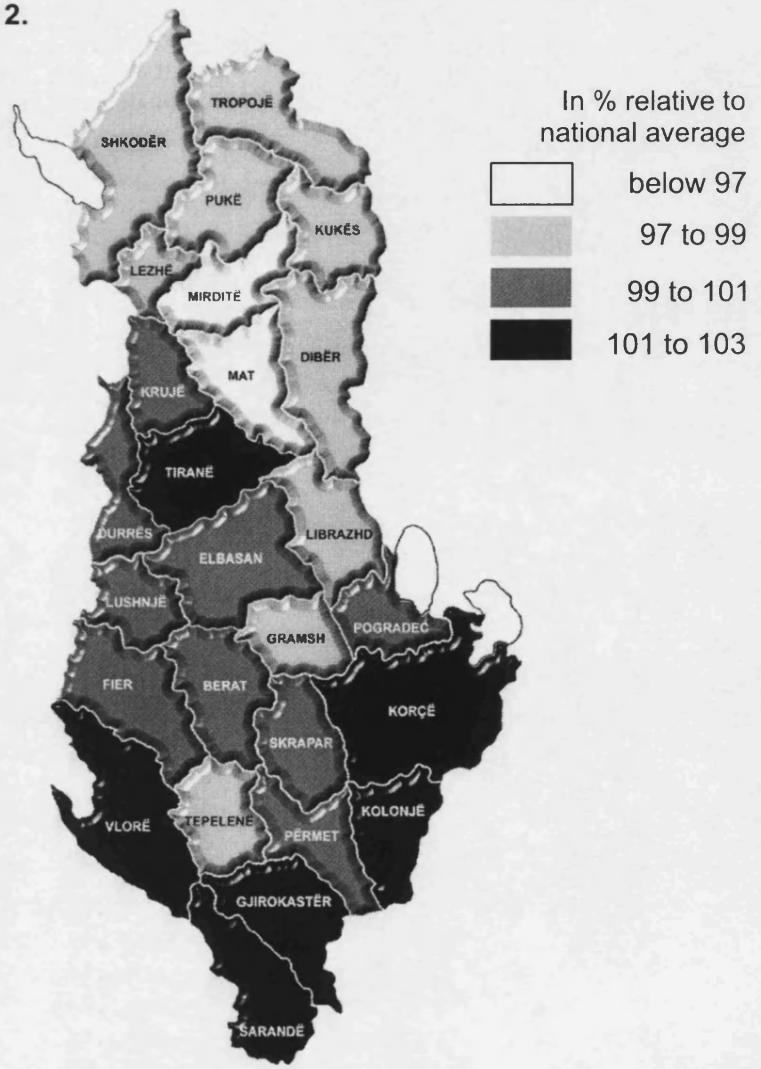
- 50.0
50.0 - 100.0
100.0 - 150.0
150.0 - 200.0
200.0 -

Cities with:

over 300,000
250 - 300,000
200 - 250,000
150 - 200,000
100 - 150,000

Note: Percentages show the urban population.

Map 2.



In % relative to national average

below 97
97 to 99
99 to 101
101 to 103

Source: Ylli Vejsiu, Aspekte të zhvillimit industrial dhe të transformimeve demografike në RPSSH (Tirana: Universiteti I Tiranës, 1981), p.89.

Fig 6.2 Topographical divisions in Albania

6.2 REGIONAL DIFFERENCES IN OVERALL MORTALITY

Table 6.2 gives the crude death rate for each district in Albania from 1960 to 1989. Generally, it can be said that mortality improves with time in all districts during the whole period. In 1960 the differences in CDR values are very large among the districts. Mortality rates vary from 21.3 in Tropoja to less than half that value in Vlora, about 9.5 per thousand. The districts with the worst mortality in 1960 are Tropoja with a crude death rate of 21.3 per thousand, Mat with 20.0, Kukes and Shkoder with 19.9, Puke with 19.8 and Diber with 18.6. All these districts are located in north of Albania. While the districts with the lowest crude death rate are Vlora, Saranda, and Gjirokastra in the south, with respectively CDRs of 9.5, 10.2 and 11.2 per thousand; Tirana - the capital of the country with 10.8 and Lushnja, Fier and Berat, in central and coastal Albania, with 11.1, 11.6 and 11.8 per thousand.

Table 6.2 Crude death rates by districts in Albania

in ‰

Districts	1960	1969	1978	1989
1. Berat	11.8	6.9	6.3	4.6
2. Diber	18.6	10.2	8.1	6.4
3. Durres	13.9	7.0	6.0	5.4
4. Elbasan	13.5	7.7	6.2	5.0
5. Fier	11.6	6.0	5.2	4.8
6. Gramsh	15.0	8.3	6.2	4.3
7. Gjirokaster	11.2	6.4	6.8	6.4
8. Kolonje	11.0	6.5	5.9	5.0
9. Korce	15.0	7.2	6.2	5.9
10. Kruje	14.5	7.1	5.1	4.9
11. Kukes	19.9	9.9	8.0	5.6
12. Lezhe	17.1	8.6	6.8	5.2
13. Librazhd	13.7	9.0	7.3	5.5
14. Lushnje	11.1	6.6	5.4	4.6
15. Mat	20.0	8.9	6.5	6.0
16. Mirdite	13.3	8.4	6.5	5.8
17. Permet	13.9	6.1	5.5	5.0
18. Pogradec	19.0	8.8	6.2	5.5
19. Puke	19.8	9.2	8.3	6.2
20. Sarande	10.2	5.7	5.4	5.2
21. Skrapar	13.9	6.5	5.4	4.6
22. Shkoder	19.9	10.0	7.7	6.2
23. Tepelene	14.2	6.2	5.0	5.4
24. Tirane	10.8	6.7	6.0	5.3
25. Tropoje	21.3	10.9	8.0	5.9
26. Vlore	9.5	5.4	5.3	5.2

Despite the fact that mortality decreased from 1960 to 1969, the differences between the regions remained very distinctive. Thus, Tropoja and other northern districts have a high mortality at a crude death rate of about 10 per thousand, while the districts with the lowest mortality still remains the southern areas of Vlora and Saranda with a crude death rate about half of that in the northern area of the country.

In 1978 and 1989, with mortality improving further, the differences start narrowing, but they do not disappear. Again, the region with the highest mortality remains the north-eastern part of Albania. The worst mortality districts in 1979 are Tropoja with a CDR of 8.0, Puka with 8.3, Diber with 8.1, Kukes with 8.0, Shkoder with 7.7 and Librazhd with 7.3 per thousand. While mortality in north-east Albania is high, the opposite is true for the south-west Albania. Mortality is low in Vlora, Tepelena and Saranda in the south, with a CDR of 5.3, 5.0 and 5.4 per thousand. It is also low in south coastal districts of Fier and Lushnje, with a CDR of 5.2 and 5.4 per thousand.

It is clear that in 1989 compared with 1979 mortality has improved considerably and all the districts have a level of CDR at about 5 or 6 per thousand. Although the mortality has gone down rapidly, regional differences remain. The districts of the north-east Albania still show high mortality compared with the south-west. Thus, Diber, Mat, Kukes, Shkoder and Tropoje have the worst mortality in the country.

From Table 6.2 one can see that there is north-east, south-west gradient of mortality in Albania. These mortality divisions are clearer in Figure 6.3, where the regions are grouped based on the values of crude death rates for 1960, 1969, 1978 and 1989. By looking at these mortality maps of Albania there are two distinctive elements that are worth mentioning. First, there is a clear north-east vs. south-west gradient of mortality in the country, where the south-western region of Albania have a better mortality compared with the north-east. Perhaps even more significantly, this mortality division in the country has retained throughout the whole period 1960-1989, despite the rapid improvement in mortality.

It is known that crude death rate is a general indicator of overall mortality, which might be distorted by the different age structure of the populations. Thus, in order to see if this regional mortality pattern will still remain, when the influence of the age structure is eliminated, the values of life expectancy at birth are calculated for all the districts for 1960 and 1989. These two years are chosen not just because they are the beginning and the end of the period under consideration, but also because the

detailed information on deaths by districts and age was only available for these two years.

The regional mortality pattern, coming from the values of life expectancy at birth[1] for these two years is given in Figure 6.4.

As with the pattern obtained from comparison of crude death rates, the comparison of life expectancy at birth indicates the same regional mortality pattern. It is clear that both in 1960 and in 1989, the north-east to south-west gradient of mortality is present in Albania.

The regions with the worst mortality in 1960 are the same northern districts, such as Tropoja and Shkodra with an e_0 of 50 years, and Kukes and Puke with an e_0 of 52.4 and 52.8 years, while the districts with the highest life expectancy at birth are the south-western districts of Vlora, and Saranda with an e_0 of 66.2 and 65.5 years, and Fier and Berat with e_0 of 64.3 and 64.7 years. As with the comparison of crude death rates, the differences between the best and worst mortality areas are very marked. Thus, the difference between life expectancy at birth in Vlora and Tropoja in 1960 is about 16 years.

As previously mentioned in 1989 compared to 1960, although the mortality improves rapidly, the regional pattern does not change much. North-east Albania still has worse mortality compared to south-west. What is different in 1989 is that the gap between the highest and the lowest value of life expectancy at birth is not as wide as in 1960. Thus, the difference between e_0 of Diber and Sarande is about 5.3 years. Thus, both indicators, CDR and e_0, show the same changing pattern.

The districts with the lowest e_0 remain Dibra with 69.9 years, Puke and Tropoje with e_0 of 70.5 and 71.1 years, as well as Shkoder and Kukes with an e_0 of 71.4 years[2]. While the districts with the highest e_0 are Saranda with e_0 of 75.1 years, Permet and Kolonje with 75 years, as well as the

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[1]When the life tables were calculated, some of the districts were grouped and the life tables were calculated for the groups rather than for the districts. This is done because the population of some districts is very small and the calculations might be distorted. Thus, in 1960 and 1989, Permet and Skrapar were grouped together, as well as Lezhe and Kruje.

[2]It has to be noted that the mortality indicators in this chapter are not corrected with the completeness coefficients. Thus the values of e_0 for the districts on average might appear slightly higher than the national average level of that year. Because we are interested in the regional differences rather than the regional levels in themselves, it was not thought necessary to calculate regional completeness coefficients.

coastal districts of Lushnje, Fier and Vlore with an e_0 respectively of 74.0, 73.7 and 73.6 years.

With regard to overall mortality, it can be concluded that there is a clear regional pattern of mortality in Albania, which has been there since the sixties and still remains today. The mortality in north-east is worse than in south-west Albania.

6.3 REGIONAL DIFFERENCES IN CHILD AND ADULT MORTALITY

Before analysing the factors that lie behind the regional mortality differences in Albania, a more detailed mortality analysis is required by age. Mortality at different ages can be influenced by a variety of factors, that can be the same for all ages, but in many cases have different impacts at different ages. That is why it is important to see if the mortality gradient between north-east and south-west Albania in due to differences in child mortality, adult mortality or both.

To analyse the differences in child mortality the values of probability of dying between ages 0-5 are calculated, while with regard to adult mortality the probability of dying between ages 15 to 60 is chosen. As in the analysis of life expectancy at birth, 1960 and 1989 were chosen for this analysis. The values of ${}_5q_0$ and ${}_{45}q_{15}$ are shown in Table 6.3, and are also plotted in Figure 6.5, where the districts are grouped based on these two indicators.

Looking at Table 6.3, one can see that both child and adult mortality have improved dramatically from 1960 to 1989 for all the districts. The most substantial improvements are in child mortality. Based on the trends of child mortality at the national level, one would expect a large improvement at the regional level. The values of ${}_5q_0$ in 1960 show a very wide range between child mortality at the regional level. The difference between the highest value, Tropoja and the lowest one, Gjirokastra is about 217 per thousand, almost three times lower. The districts with the highest child mortality are Tropoja, with ${}_5q_0$ of 350.5 per thousand, Shkodra (344.5), Puka (339.2), Mat (316.6), Kukes (338.0), and Diber (303.3); All these are districts located in northern Albania.

Table 6.3 Regional differences of child and adult mortality in Albania

in ‰

Districts	1960		1989	
	$_5q_0$	$_{45}q_{15}$	$_5q_0$	$_{45}q_{15}$
1. Berat	174.6	128.4	38.8	83.3
2. Diber	303.3	181.4	72.5	106.7
3. Durres	239.5	145.3	50.1	94.6
4. Elbasan	201.6	168.2	49.0	91.1
5. Fier	175.2	124.5	40.2	86.7
6. Gramsh	219.7	171.8	33.3	77.7
7. Gjirokaster	133.8	144.3	27.9	89.2
8. Kolonje	224.7	170.5	32.2	84.2
9. Korce	224.7	170.5	32.4	99.1
10. Kruje	239.3	109.9	45.1	101.3
11. Kukes	338.0	150.7	56.4	125.6
12. Lezhe	294.2	124.1	45.1	101.3
13. Librazhd	210.4	194.4	57.1	112.3
14. Lushnje	167.9	118.2	34.7	84.7
15. Mat	316.6	143.9	44.2	121.5
16. Mirdite	242.2	143.4	38.0	107.1
17. Permet	207.0	147.4	32.2	84.2
18. Pogradec	313.5	217.0	45.4	111.6
19. Puke	339.2	161.1	60.5	122.0
20. Sarande	145.3	110.3	20.6	70.7
21. Skrapar	207.0	147.4	34.0	95.4
22. Shkoder	344.5	171.1	50.3	98.0
23. Tepelene	194.9	112.8	33.5	88.9
24. Tirane	169.5	124.8	32.5	94.4
25. Tropoje	350.5	201.0	49.1	154.2
26. Vlore	134.9	122.2	43.8	89.4

Note: For comparison reasons the $_{45}q_{15}$ and $_5q_0$ are shown in per thousand in this table.

While the north of the country has a very high infant and child mortality, south-western Albania has relatively low infant and child mortality. Thus, the districts with the lowest child mortality are Vlora with a $_5q_0$ of 134.9, Saranda with 145.3, and Gjirokastra with a $_5q_0$ of 133.8 per thousand. Other south-western districts also do well, e.g. Tepelena with a $_5q_0$ of 194.9, Fier with 175.2, Lushnje with 167.9 and Berat with a $_5q_0$ of 174.6 per thousand. Tirana, the capital of the country also has a relatively low child mortality, about 169.5 per thousand.

The differences found among child mortality in 1960 are similar to those found in overall mortality. However, in 1989 after a rapid improvement of child mortality in all regions, the pattern slightly

changes. There are districts in the north that have relatively low child mortality and there are districts in the south that have relatively high child mortality. Thus, Tropoja having the worst mortality in 1960, overall and for children, in 1989 has a ${}_5q_0$ of 49.1 per thousand, while coastal districts like Vlora, Fier and Durres have a worse level of child mortality compared to other parts of the country, respectively of about 43.8, 40.2 and 50.1 per thousand. However, the majority of the northern districts still have relatively high child mortality. Dibra has a ${}_5q_0$ of 72.5 (the worst in the country in 1989); Puka, of 60.5; Kukes, of 56.4; and Shkodra has a ${}_5q_0$ of about 50.3 per thousand. In the south, the pattern of mortality is mixed, as mentioned Vlora and Fier have a worse level than other districts in the south, but Saranda and Gjirokastra have the lowest child mortality in the country, with a ${}_5q_0$ of about 20.6 and 27.9 per thousand.

Concluding this discussion of regional differences in child mortality, it can be said that in 1960 the pattern of regional differences is similar to that of overall mortality, with north-west having worse mortality compared to south-east. In 1989, the north remains the highest mortality area of the country, but the north-east and south-west division is not as clear as in overall mortality.

When adult mortality is considered, as previously described in Chapters 4 and 5, Albania as a whole has a very low adult mortality which has been present since the fifties. This finding is also true at the regional level. Thus, the worst value of probability of dying at ages 15-60 in 1960 Albania is Pogradec with a ${}_{45}q_{15}$ of 217.0 per thousand, which is similar to the ${}_{45}q_{15}$ of Hungary and Soviet Union in the eighties (Feachem et al, 1992, p. 301).

The regional differences in adult mortality are not as substantial as those in child mortality. However, compared to the average national level, the variation is still high. Thus in 1960, the difference between the worst value of ${}_{45}q_{15}$, Pogradec (217.0) and the best, Sarande (110.3), is still marked, at about two to one.

The districts with the highest probability of dying among adults are not only some northern ones, but also some districts located in eastern Albania, such as Pogradec with the worst ${}_{45}q_{15}$ in 1960, Korca and Kolonja with a ${}_{45}q_{15}$ of about 170.5 per thousand, Librazhd and Gramsh with respectively a ${}_{45}q_{15}$ of 194.4 and 171.8 per thousand. The worst adult mortality in the north is among the same districts as overall mortality, such as Tropoja with a ${}_{45}q_{15}$ of 201.0, Shkodra with a ${}_{45}q_{15}$ of 171.1, Diber with a ${}_{45}q_{15}$ of 181.4, and Puke with a ${}_{45}q_{15}$ of 161.1 per thousand.

The districts that show lower adult mortality in 1960 are the south-western districts of Saranda, with a ${}_{45}q_{15}$ of 110.3, Tepelena with a ${}_{45}q_{15}$ 112.8, Lushnja with a ${}_{45}q_{15}$ of 118.2, Vlora with a ${}_{45}q_{15}$ of 122.2, Fier with a ${}_{45}q_{15}$ of 124.5, and Berat with a ${}_{45}q_{15}$ of 128.4 per thousand. The capital Tirana has also a low probability of dying in 1960, for about 124.8 per thousand.

With regard to adult mortality, it is interesting to note that even when it improves rapidly from 1960 to 1989, the pattern of regional differences does not change much. Thus, Figure 6.5 shows clearly that the north-east and south-west gradient in adult mortality is still there. The districts with the worst probability of dying among 15-60 year olds are again, Tropoja with a ${}_{45}q_{15}$ of 154.2, Puke with 122.0, Kukes with 125.6, Librazhd with 112.3, Mat with 121.5 and Diber and Mirdite with a ${}_{45}q_{15}$ of 106.7 and 107.1 per thousand respectively. As in 1960, the districts with the lowest adult mortality are the south-western districts of Saranda, Vlora, Fier, Tepelene, Lushnje and Berat.

To conclude the assessment of regional differences in adult mortality, it can be said that the north-east and south-west mortality division found in overall mortality is also present in adult mortality. What is different here is that the pattern changes slightly compared with child mortality and overall mortality measured by e_0, with adult mortality worsening further in the east Albania, in places such as Korca, Kolonja and Pogradec and improving in the coastal regions of Durres and Kruje.

6.4 A WIDER PERSPECTIVE ON REGIONAL DIFFERENCES.

Examining spatial differentials in mortality within Albania naturally leads on to a consideration of wider geographical patterns. The nation-state has often been shown to be a rather inappropriate level for demographic analysis, and this is especially likely to be true in Albania, since large Albanian populations live across the border in neighbouring countries.

It is difficult to find a region which is more diverse than the Balkans, when it comes to cultural, ethnic and life style factors. The socio-economic differences are also very marked in the region. What is of particular interest is that these differences are found not just among the nation states, but also between different regions of a particular country. Simply remembering the former Yugoslavia, which was a state build on ten recognised nationalities, one can understand the diversity of the Balkans.

While analysing trends in the former Yugoslavia, Kunitz argues that health transition and mortality trends in Yugoslavia can only be understood in the context firstly of moves toward national

unification of Yugoslavia, and then of the subsequent demise of this aspiration (Kunitz, 1996, p. 270).

Because of this diversity, this section focuses on the differences or/and similarities of Albania with other neighbouring countries and regions of the Balkans. The comparison starts with the former Yugoslavia, and is later extended into other federal units of the former Yugoslavia, in particular those that border Albania - Kosova and Macedonia. Kosova is chosen, not just because it borders Albania in the north, but also because its population is predominantly Albanian. Thus, in 1961 Albanians made up about 66.1% of the total population of Kosova, and in 1981 77.4% (SYY, 1995, p. 57). Macedonia, which borders Albania in the eastern side of the country, also has a large Albanian population, about 23% of the total population. The other country that borders Albania is Greece, in the south-east. The comparison with Greece is also broken into some main regional units, such as Greek Macedonia, Epirus, Thrace etc.

Table 6.4 compares Albania with the former Yugoslavia. Life expectancy at birth is calculated, as an indicator of overall mortality, probability of dying at age 0-1, as indicator of infant mortality, and the probability of dying at ages 15-60 as an indicator of adult mortality.

Looking at this table, it is clear that countries went through a rapid improvement of mortality from 1950 to 1990. In the fifties they both had a high infant mortality rate of over 100 per thousand for both sexes, although in Albania it is somewhat higher. Overall mortality improved at about the same pace for both countries until 1990. The differences in male mortality between the two countries are smaller than in female mortality in the fifties. After a rapid improvement of female mortality in Albania during 1950-1969, the differences are more or less similar for both countries. In terms of overall mortality, Yugoslavia does better compared with Albania at the end of eighties[3]. Although infant mortality improved dramatically for both countries, at the end of the eighties, Albania had a much higher infant mortality rate for both sexes, with about 43.4 and 47.0 per thousand, which is more than double the figures for Yugoslavia (20.5 and 17.9 per thousand).

[3]If the mortality figures of Albania were not corrected with the completeness coefficients, both the countries should have the same life expectancy at birth.

Table 6.4 Mortality Indicators of Albania and Former Yugoslavia, 1950-1990[4]

Male

Albania				Former Yugoslavia			
Years	e_0	$_1q_0$	$_{45}q_{15}$	Years	e_0	$_1q_0$	$_{45}q_{15}$
1950	51.9	142.2	29.2	1950	55.0	120.2	29.5
1960	61.7	92.0	18.9	1960	62.1	93.2	19.7
1969	64.6	88.4	17.3	1970	65.1	55.9	20.2
1979	65.6	73.2	14.9	1980	67.8	33.2	19.8
1989	67.9	47.0	13.1	1990	69.6	20.5	19.2

Female

Albania				Former Yugoslavia			
Years	e_0	$_1q_0$	$_{45}q_{15}$	Years	e_0	$_1q_0$	
1950	51.3	144.0	24.8	1950	58.7	105.2	22.8
1960	62.2	101.3	13.6	1960	65.4	85.2	15.1
1969	68.5	89.8	10.0	1970	69.9	52.7	11.8
1979	70.6	74.8	7.7	1980	73.3	30.2	10.1
1989	73.9	43.4	6.9	1990	75.6	17.9	9.0

Note: $_{45}q_{15}$ is shown in per hundred in this table and the coming ones.

Source: The life tables on Yugoslavia are calculated based on the data published in the yearly "Demografska Statistika" (Demographic Statistics) 1950-1990 from the Statistical Office in Belgrade.

Quite another picture emerges when adult mortality is considered. Since 1960, for both sexes Albania has had much better adult mortality than Yugoslavia. At the end of eighties, Albania had a $_{45}q_{15}$ of 13.1 and 6.9 for males and females, compared to 19.2 and 9 per thousand in the former Yugoslavia.

Summarising this comparison to Yugoslavia, it can be said that Albanian mortality pattern shows better adult mortality and worse infant mortality during most of 1950-1990.

[4]It is difficult to judge on the accuracy of the death registration of Yugoslav data. Moreover, it is not in the scope of this research. However, it is important to mention that other scholars, researching trends and patterns of mortality in the Balkans, such as Mesle, F. and Macura, M. have been successfully using these data (Mesle, F. 1991).

Table 6.5 Mortality Indicators of Albania and Kosova, 1950-1990

Male

Albania				Kosova			
Years	e_0	$_1q_0$	$_{45}q_{15}$	Years	e_0	$_1q_0$	$_{45}q_{15}$
1950	51.9	142.2	29.2	1950	51.9	142.2	29.0
1960	61.7	92.0	18.9	1960	57.0	138.1	21.8
1969	64.6	88.4	17.3	1970	64.4	89.2	18.2
1979	65.6	73.2	14.9	1980	70.5	61.6	13.9
1989	67.9	47.0	13.1	1988	69.5	52.3	15.7

Female

Albania				Kosova			
Years	e_0	$_1q_0$	$_{45}q_{15}$	Years	e_0	$_1q_0$	$_{45}q_{15}$
1950	51.3	144.0	24.8	1950	52.0	124.9	32.0
1960	62.2	101.3	13.6	1960	55.8	149.8	22.6
1969	68.5	89.8	10.0	1970	66.1	102.9	14.2
1979	70.6	74.8	7.7	1980	74.7	63.4	9.2
1989	73.9	43.4	6.9	1988	76.2	50.9	9.1

One has to remember that Yugoslavia was made up of 8 federal units, and it covered a wide area from central Europe (bordering Austria) to the Mediterranean region. In such a case a detailed comparison with the regions that are closer to Albania, becomes important. Table 6.5 shows this comparison for one of the southern provinces of Yugoslavia, Kosova.

It is interesting to note that mortality patterns in the fifties are almost identical, in particular for males. Life expectancy at birth is relatively low at about 52 years for both sexes in Albania and Kosova. Infant mortality rate is similar for males at 142.2 per thousand, as is adult mortality at around 29.0 per thousand. With regard to females, Albania has a worse infant mortality rate and slightly better adult mortality. It is interesting to note that the two Albanian populated regions both have a slight female disadvantage in infancy and in life expectancy at birth. In Albania, this disadvantage in infancy is present not just in the fifties, but also in the sixties and seventies. In Kosova this disadvantage is present in the sixties and seventies. For both regions, the situation improves in the

eighties, with female infant mortality improving faster than that of males. As explained in Chapter 4, this difference found in the mortality patterns of these two populations is related to the traditional traits of Albanian society, where male infants and children were favoured compared with females in terms of care and nutrition.

With regard to adult mortality, males have more or less the same pattern - low adult mortality for both regions. The only difference is at the end of eighties, when Albania has a better adult mortality. The opposite is true for females. During the whole period Albania has a better ${}_{45}q_{15}$ than Kosova. At the end of eighties, despite the improvement of female adult mortality in Kosova, Albania still has a ${}_{45}q_{15}$ of 6.9, while Kosova has a ${}_{45}q_{15}$ of 9.1 per thousand. In this comparison, it can be said that both the regions have a similar infant mortality pattern, with very high infant mortality and similar sex differences. In contrast with regard to adult mortality, the male pattern is almost the same, while female adult mortality in Albania is lower than in Kosova.

Moving further south in the Balkans, to its eastern part, Albania is bordered by the Former Yugoslav Republic (FYR) of Macedonia. The mortality comparison between Albania and Macedonia is given in Table 6.6.

Despite the fact that in the fifties, Macedonia had a better overall mortality with e_0 for males 5.1 years higher than Albania, and for females 6.9 years, both the countries had a considerable improvement during 1950-1990. The female disadvantage which is present in Albania and Kosova is not present in Macedonia. At the end of the eighties, male overall mortality in Macedonia is lower than in Albania, while female mortality is slightly higher. Both the countries has a high infant mortality and a low adult mortality at the end of the eighties.

It is interesting to note that the differences in adult mortality for both sexes are similar to Kosova and Albania. Macedonia also has a low male adult mortality. During 1950-1970 male adult mortality is lower in Macedonia, not just compared with Kosova, but also Albania. At the end of the eighties Albania improves further to a low value of ${}_{45}q_{15}$ of about 13.1 per thousand, which is lower than in Kosova and Macedonia. With regard to female adult mortality, Macedonia has a better ${}_{45}q_{15}$ than Kosova, but a much higher rate than Albania.

Table 6.6 Mortality Indicators of Albania and Republic of Macedonia (of the former SFR of Yugoslavia), 1950-1990

Male

Albania				R. Macedonia			
Years	e_0	${}_1q_0$	${}_{45}q_{15}$	Years	e_0	${}_1q_0$	${}_{45}q_{15}$
1950	51.9	142.2	29.2	1950	57.0	137.4	23.2
1960	61.7	92.0	18.9	1960	62.1	124.8	15.9
1969	64.6	88.4	17.3	1970	66.4	82.0	15.4
1979	65.6	73.2	14.9	1980	68.1	56.0	14.9
1989	67.9	47.0	13.1	1988	69.7	40.1	15.1

Female

Albania				R. Macedonia			
Years	e_0	${}_1q_0$	${}_{45}q_{15}$	Years	e_0	${}_1q_0$	${}_{45}q_{15}$
1950	51.3	144.0	24.8	1950	58.2	124.9	23.0
1960	62.2	101.3	13.6	1960	62.8	121.1	15.6
1969	68.5	89.8	10.0	1970	68.6	86.2	10.8
1979	70.6	74.8	7.7	1980	71.7	51.7	9.6
1989	73.9	43.4	6.9	1988	73.6	39.0	8.5

Concluding the Yugoslav comparisons, the most distinctive finding here is that, with regard to male adult mortality, Macedonia has better mortality in the early period and then a similar rate to Kosova, but a higher one compared with Albania. When female adult mortality is considered, Macedonia has a better mortality than Kosova, and a worse one than Albania.

In its south-western frontier Albania is bordered by Greece. As in the comparison with Yugoslavia, the comparison with Greece will be based on a sub-division of the national level. Greece is composed of different regional units. Albania is bordered by two of these regions - Greek Epirus in the south, and Greek Macedonia in the south-east. Apart from these two regions, Greek Peloponneses and Greek Thrace will be included in this comparison. The first lies further down in the Mediterranean, and the second is located further left in the east of Greek Macedonia. These regions were chosen to see if there are any mortality divisions similar to those found in Albania.

It is known that Greece has among of the lowest mortalities in Europe, in particular its adult

mortality. In 1990, Greece had a life expectancy for males of 74.6 years and for females 79.7 years. Looking at the previous decades, mortality in Albania and Yugoslavia was much higher than Greece. Thus, in 1951 Greece had an e_0 of 63.5 years for males and 66.7 for females, while Albania and Yugoslavia had an e_0 of respectively 51.9 and 55.0 years for males, and 51.3 and 58.7 for females. This difference in the level of overall mortality makes the comparison of mortality patterns difficult. However, in order to facilitate comparison of mortality a different approach is followed.

First, for the same level of life expectancy at birth (e_0 in 1989 Albania is taken), the ${}_nq_x$ values of selected Greek and Yugoslav regions were interpolated for both sexes. Then, the differences between the patterns are calculated as ratios of the ${}_nq_x$ values between each region and Albania. The standard deviations of all ages and ages 15-60 are calculated to see the variation of each pattern (Greek and Yugoslav region) from the Albanian pattern. The values of standard deviations are given in Table 6.7. In other words, the values of Table 6.7 show the standard deviation of the ratios between the mortality rates (${}_nq_x$ values) of these regions and Albania. Higher the value of standard deviation, larger the differences between the age-mortality patterns of these regions and Albania.

Table 6.7 Variation from Albanian mortality pattern of some selected regions in the Balkans.

Countries and Regions	Standard Deviation (in%)			
	for all ages		ages 15-60	
	Males	Females	Males	Females
Greek Epirus	17.6	32.0	8.2	22.4
Greek Macedonia	17.8	50.9	8.6	36.4
Greek Peloponnesus	17.6	32.0	8.3	22.0
Greek Thrace	20.5	35.0	10.5	23.0
FYR of Macedonia	26.4	38.2	22.0	33.5
Kosova	29.4	29.6	30.8	23.1
Croatia	68.9	48.4	48.5	42.5

Note: 1.The level of e_0 on which these calculations are based is for males 67.92 years and females 73.84 years (e_0 of Albania in 1989).
2. The standard deviations are shown in per hundred.

The regions selected are those bordering Albania in the north-east, Kosova and FYR Macedonia, in the south-east, Greek Epirus and Greek Macedonia, as well as three more regions; one in the very north of the Balkans, Croatia; one in the very south (in the Mediterranean), Peloponnesus; and one in the south-east Balkans, Thrace. This selection of regions was done to see if there is any change

of mortality pattern relative to the location in the Balkans.

Table 6.7 shows a higher variation for females than for males compared with Albanian pattern (except for Croatia). This means that Albanian mortality pattern for females is much more different than the male pattern when compared with these regions. The other distinctive point of this table is that Albanian pattern is similar (the SD is lower) to the Greek regions, but not to those of Yugoslavia. For example, the comparison of males for all ages shows that the lowest variation from the Albanian pattern is in the Greek regions of Epirus, Macedonia, and Peloponnesus. A similar result holds for females, but in this case the variation is lowest between the Albanian pattern and Greek Epirus and Peloponnesus. It is also clear that the more the comparison moves towards the north Balkans, the more the variation is increased, implying that the patterns are more distinct from each other. Thus, the variation for Croatia is the highest for both sexes, but especially for males - three or four times higher than the Greek regions of Epirus and Peloponnesus. The regions located in the east of the Balkans, FYR of Macedonia, Greek Macedonia, and Thrace also show more differences from Albania, though to a lesser extend than Croatia.

These differences within the patterns are even more clear-cut, when ages 15 to 60 are considered. The most similar models to Albania again are those of Greek Epirus and Greek Peloponnesus. Further one moves in north or east, the higher the variation from the Albanian pattern. Thus, for males, comparison with the Greek regions shows that in Greek Macedonia, and further east, Thrace, the standard deviation is higher than in southern regions of Greece. This is also true the further one moves north. Thus, the variation among FYR of Macedonia and Albania is higher than the Greek regions, but is lower than Kosova, and even lower when than Croatia. For females, once more Albania has a similar pattern to Greek Epirus and Peloponnesus, and a rather different one from Croatia, FYR of Macedonia and Greek Macedonia.

What this analysis shows is that the Albanian mortality pattern, particularly among adults, is more similar to that of the bordering Greek region of Epirus, and the southern region of Peloponnesus, than with the north-eastern bordering regions of FYR of Macedonia, Greek Macedonia, and Kosova. Croatia in the very north of Balkans and Greek Thrace in the very east are even more dissimilar.

Table 6.8 shows the values of ${}_{45}q_{15}$ for these regions and Albania. The comparison now includes all the Yugoslav republics as well as Romania and Bulgaria. As previously mentioned, the fact that Greece has a much better mortality than Albania or any other Balkan country, makes the comparison

difficult. Moreover, Table 6.8 compares Albania in 1989 to Greece in 1981, because in 1981 the information on Greece was available for its regions. Albania is sub-divided into two main mortality patterns found at the beginning of this chapter, north-east and south-west regions.

By looking at the values of ${}_{45}q_{15}$ in Table 6.8, it is clear that for both sexes, Albania has made similarity in adult mortality with Greece and its regions, than with Yugoslavia and other north-east Balkan countries of Romania and Bulgaria. The worst adult mortality in 1990 is found in the north east of the Balkans, in Slovenia, Croatia, Romania, Bulgaria, Serbia and Bosnia-Hercegovina. Moving further in the south, adult mortality improves even within Yugoslavia. Thus, the southern regions have a better adult mortality than the northern regions. Kosova has better mortality than the northern regions, but not compared with FYR of Macedonia and Albania in its south, and Montenegro in its west. This "north-east rule" is true even for Albania. The north-east of Albania has a more similar adult mortality with its north regions of Montenegro, than its eastern neighbour FYR of Macedonia. While south-west Albania has a better mortality compared with any region to its north-east, but it has slightly lower adult mortality than the southern Greek regions of Epirus and Peloponnesus. This is particularly true for male adult mortality.

Table 6.8 Adult mortality measured by ${}_{45}q_{15}$ of Albania and other regions in the Balkans.

Countries and Regions	Year	Male	Female
Albania	1989	13.1	6.9
Albania, north-east	1989	14.1	7.5
Albania, south-west	1989	12.1	6.3
Greece	1981	12.9	7.3
Greek Epirus	1981	11.1	6.7
Greek Peloponnesus	1981	11.4	6.7
Greek Macedonia	1981	12.1	7.4
Greek Thrace	1981	15.0	9.4
Yugoslavia	1990	19.2	9.0
Slovenia	1988	22.5	9.3
Croatia	1988	23.6	9.4
Serbia	1988	18.7	9.6
Bosnia-Hercegovina	1988	19.5	9.7
Macedonia	1988	15.1	8.5
Monte Negro	1988	14.6	7.1
Kosova	1988	15.6	9.1
Romania	1990	23.9	11.4
Bulgaria	1990	21.6	9.7

Note: The division of Albania into north-east and south-west is based on the division shown in figure 6.6.

In concluding this section, one can say that Albania as a whole had better adult mortality than Yugoslavia during 1950-1990, and at the same time worse mortality than its southern neighbour Greece. When more detailed regional level analysis was undertaken, it was found that adult mortality in Albania in 1990 is better than all the north-east regions in the Balkans (including the Yugoslav republics, Romania and Bulgaria), although that the difference narrows when moving from north-east to south -west Balkans. Moving this regional analysis further into the south-east Balkans (north-east Greece), one can say that Albania has more similarity in mortality to the southern Mediterranean regions of Epirus and Peloponnesus than with the eastern regions of Greece.

6.5 CONCLUDING NOTES

The analysis of regional differences showed that there is a marked north-east and south-west gradient of mortality in Albania, with mortality in the north-east much higher than in the south-west. The crude death rate was almost twice as high in some north-eastern districts as in the south-west. Similar differences were found when life expectancy at birth was used to compare mortality differences in the country. Thus, in 1960, the difference in life expectancy at birth between Shkodra and Tropoja in the north and Vlora and Saranda in the south-west was almost 16 years. Despite the general improvement of mortality in the later years and the narrowing of the differences between regions, this division of mortality remained in Albania until the end of the period of study in 1990.

When the analysis of regional differences was further broken down by age, similar findings were present, too. With regard to differences in child mortality, the 1960's pattern of regional differences in child mortality reflects that of overall mortality with the north-east having worse mortality compared to the south-west. At the end of the period under consideration, in 1989 this division is not as marked as in 1960. However, the north still has the highest child mortality in the country.

Regional differences in adult mortality also show this north-east south-west division of mortality. This mortality gradient is present not just in 1960, but also in 1989. Thus, one can say that with regard to adult mortality, the north-east vs south-west division is more clear-cut than in child mortality differences.

In trying to find an explanation for this regional mortality pattern, the first thing to do is to see if the

mortality pattern is related to the level of development in those areas. In Section 6.1 of this chapter we introduced the regional differences of two elements of development, urbanisation and education. With regard to urbanisation, most of the urban area is concentrated in the central coast of Albania, which has a low overall level of mortality compared with other regions of the country. However, the low mortality in the very south cannot be explained with the high level of urbanisation in these areas. Thus, districts such as Tepelena, Saranda, Gjirokastra or Permet located in the south of Albania have low mortality, but also a low level of urbanisation.

A relatively different picture is provided when the mortality divisions are related to the level of education. Some of the southern regions with the highest levels of education in the country, also have the lowest mortality levels, e.g Saranda, Vlora or Gjirokastra. Despite this similarity, the education pattern, as given in Figure 6.1 has some differences with the regional mortality division. Two of the clearest discrepancies are the low level of education in the southern district of Tepelena, which had low mortality throughout the period, and secondly the high level of education in Korca, which has relatively high mortality compared with other regions of the south.

Another important difference found in the relationship between education and the level of mortality is the very low level of education in the districts of Mat and Mirdite. It is known that child mortality is particularly influenced by the level of education (because of the education of mothers). Thus, based on this, the two districts of Mat and Mirdite should not have just a high overall mortality, but in particular high infant and child mortality. In fact these two districts in the eighties do not have the worst child mortality in the country. On the contrary their child mortality rates are among the national average level of the country.

In order to explain the relation between mortality and education, or other forms of development, one needs individual data that are related to mortality. However, the aggregate data on the level of education and urbanisation shed some light to the argument. It can be concluded that the levels of urbanisation and education in the country have influenced the level of regional differences in mortality, especially with regard to child mortality, but they do not appear to be the main determinants of the regional mortality pattern in Albania.

Probably the answer to the regional division in Albanian mortality lies in factors that have shaped the regional pattern of adult mortality. For quite a long time scholars have been emphasising the importance of life style and dietary patterns in the improvements of adult mortality. The very low

adult mortality in the Mediterranean countries is attributed to the effects of Mediterranean diet which has simulated a lot of discussion in the last 30 years. (Keys A, 1980). High intakes of mono-unsaturated fats and low intakes of saturated fats, accompanied by high consumption of fresh fruits and vegetables, and moderate consumption of wine have been very often addressed as the reason for low mortality among adults in Mediterranean (Kushi et al, 1995a,b).

In the mountainous regions of north-east Albania, which as explained earlier in this chapter, a more central European climate and vegetation is found, much of the food, especially fat is of animal origin. In contrast to north-east, the south-west of the country has a Mediterranean climate, and consequently a Mediterranean flora. This ecological factor has determined a dietary pattern in this part of the country, which is similar to that of other Mediterranean countries. Most of the diet in south-west is characterised by high intakes of olive oil and fresh fruits and vegetables.

Figure 6.6 shows the areas where olives are produced and mostly consumed in Albania. It is interesting to note that this regional distribution of olive cultivation is similar to the map of mortality. Albania is a country with 3.2 million population which cultivates 5.8 million olive trees in 1990, 52% of which in four main districts in the south (Gjonca and Bobak, p. 1817). It is believed that the consumption of olive oil is highest in the areas where it is produced. The consumption of fresh fruits and vegetables closely resembles that of olive oil. Although this finding needs to be interpreted with caution because of the lack of individual data on the consumption of different products in the country, no other factor offers a more plausible explanation for the regional mortality distribution in Albania.

The regional analysis of mortality in a wider Balkan perspective showed that compared with the former Yugoslavia as a whole, Albania had a much lower adult mortality for both sexes, throughout the whole period under consideration. This was also true when Albanian adult mortality was compared to that of Romania and Bulgaria in 1990. However, when the analysis was broken down into the regional level in Yugoslavia, a new pattern emerges. Thus, the comparison with Kosova and FYR of Macedonia showed that they both have low and similar levels of adult male mortality, despite the fact that in the end of eighties Albania does slightly better. This similarity was true even with the north-west bordering republic of Montenegro. What is important here is that their rates of adult male mortality are closer to Albanian rates than the average level of Yugoslavia. While with regard to adult female mortality, Albania does much better than both of these regions.

When Albanian adult mortality was compared with Greece, it is clear that Greece has a better adult

mortality than Albania. What is interesting about the comparison with Greece is that, when the analysis of mortality was broken into regional levels, Albania had more similarity with the bordering region of Greek Epirus and the further southern region of Peloponnesus, than with the eastern regions of Greece - Greek Macedonia and Thrace. Another interesting finding here is that even in terms of levels, Albania has similar female adult mortality to Epirus and Peloponnesus, and a much better one compared with Thrace and Macedonia.

There are two important points to make here. First, that even in the Balkans, as in Italy, France or any other Mediterranean country, there is a north-south gradient of mortality. Moving from northern former Yugoslavian regions to southern Greek regions, adult mortality improves gradually, and this is also shown within the Albanian regional pattern. Second, this gradient of mortality is not just true for north-south division, but also for the west-east division. The more one moves into the east Balkans, the more the adult mortality worsens.

Thus Albania can be seen to fall at the edge of a significant frontier in diet and health - The frontier between the Balkans on one hand and the Mediterranean world on the other.

Fig 6.3 Regional differences in overall mortality measured by CDR, 1960-1989

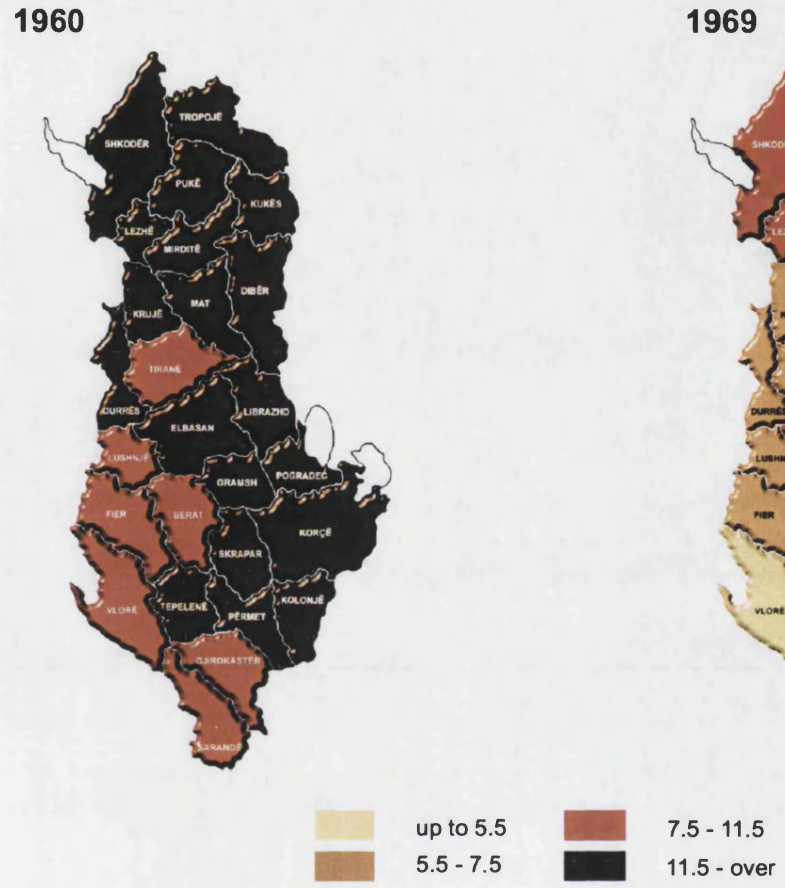


Fig 6.4 Regional differences in overall mortality measured by e_0, 1960-1989

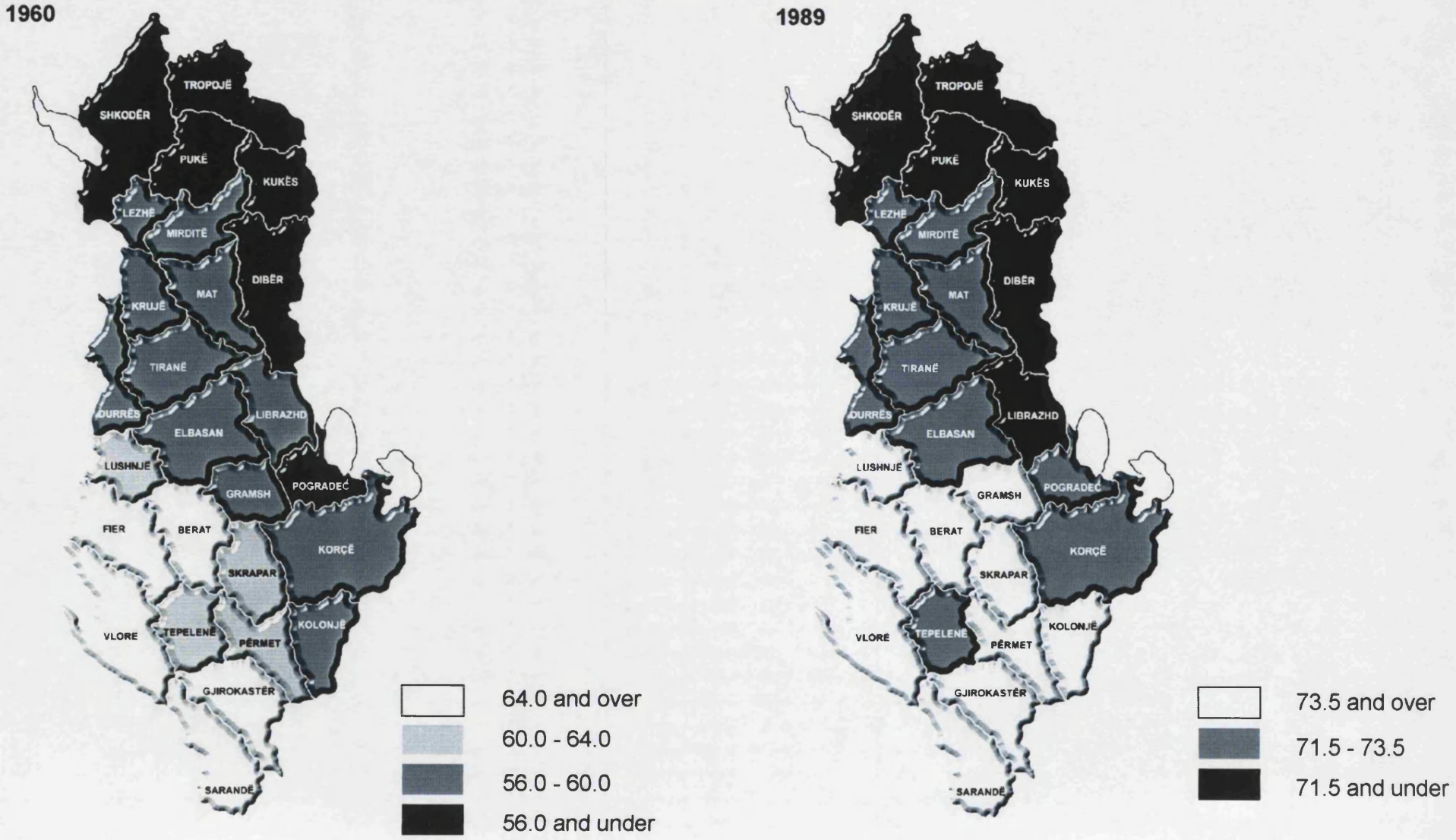
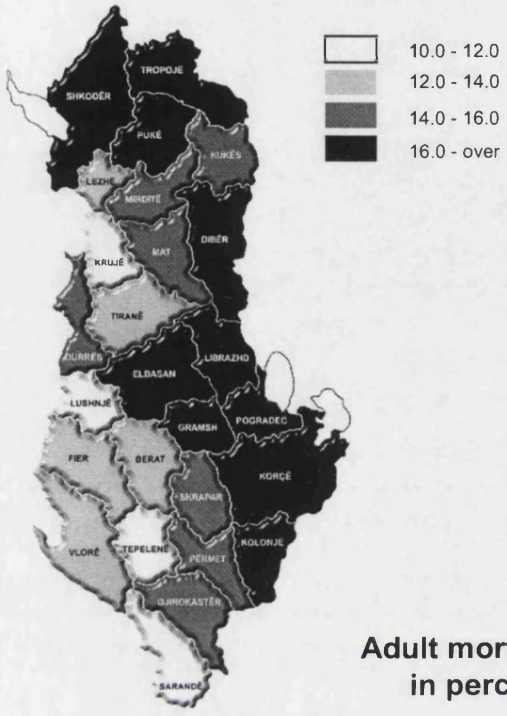
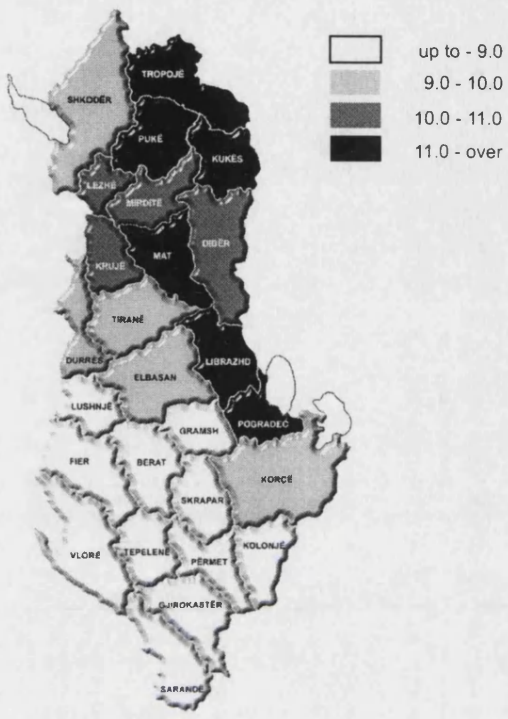


Fig 6.5 Regional differences in child and adult mortality, 1960-1989

1960

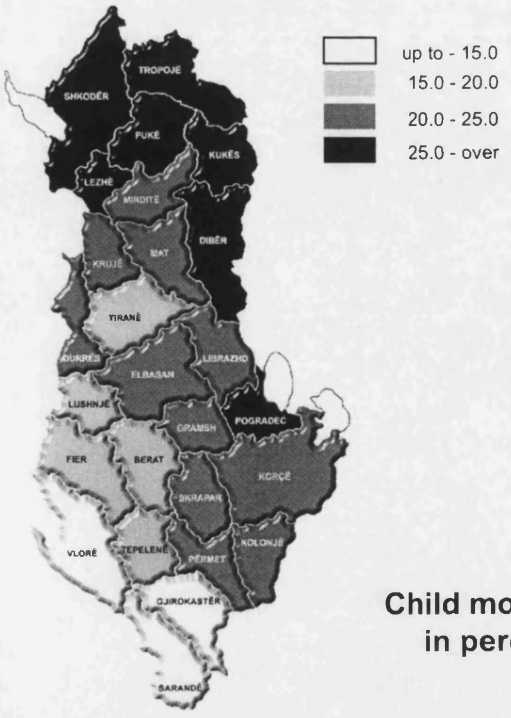


1989

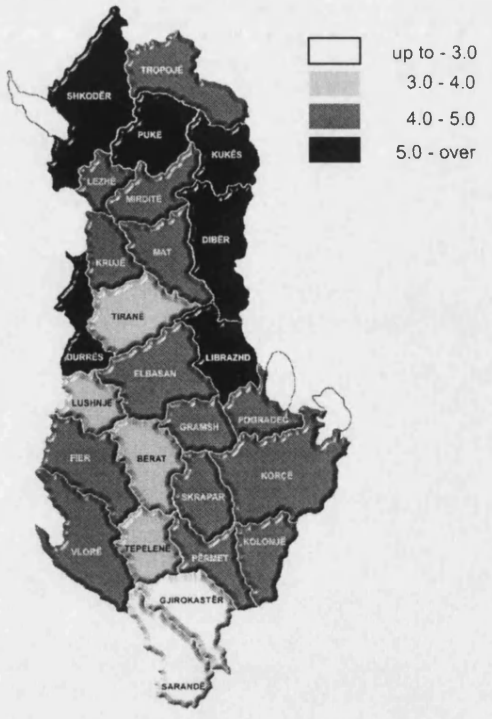


Adult mortality ($_{45}q_{15}$) in percentage

1960

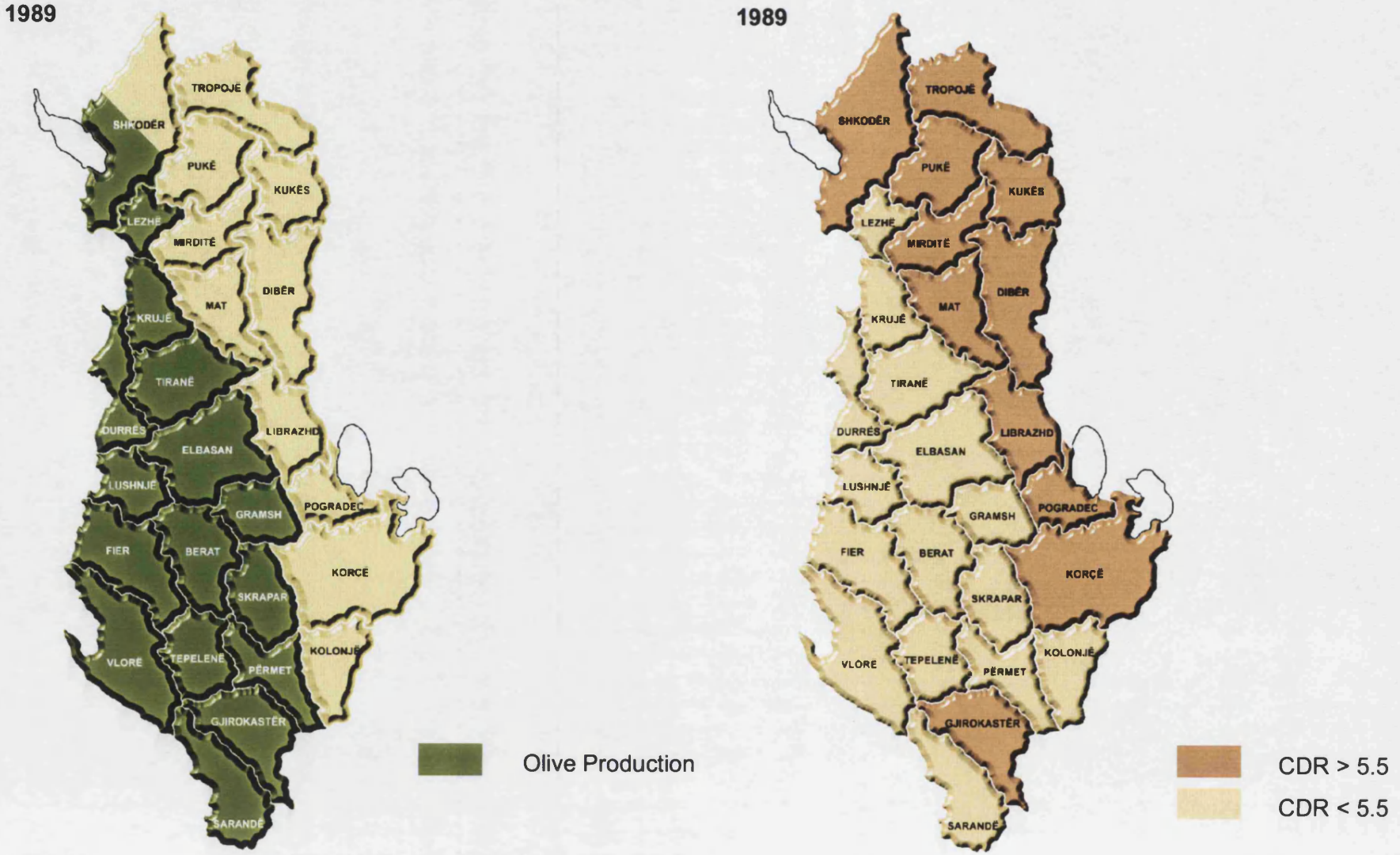


1989



Child mortality ($_5q_0$) in percentage

Fig 6.6 Geographical distribution of olive production and regional mortality



Chapter 7. MORTALITY IN ALBANIA IN INTERNATIONAL PERSPECTIVE.

7.1 INTRODUCTION

In chapter 1 Albania was classified in different dimensions based on its geographical position, its political system, as well as its economic and social developments. It was also said that its geographical position has played a major role in the past and present development of the country. From the viewpoint of a historian, Albania is part of the Balkans, in that its historical background is similar to that of its neighbours. While in terms of political developments, Albania can be seen as part of the former Central and East European communist countries. Another dimension often addressed by geographers, is the one that considers Albania as a Mediterranean country, with similar traditional and cultural traits with most of the south European countries.

Thus, one can classify Albania in different dimensions, because of the country's diversity. In order to understand the health transition of Albania, this chapter addresses three main dimensions of comparison of Albania and other countries: a) Albania as part of the former communist countries of Eastern Europe; b) Albania as part of the Mediterranean countries, which have similar cultural and traditional traits; and c) one last dimension that it is not often addressed is to compare Albania with countries which have similar economic performance, but with very positive achievements in terms of health; countries such as Sri Lanka, Costa Rica, the Indian state of Kerala, and so on.

7.11 Albania - a former communist country of Central and Eastern Europe.

Communist Albania was long perceived by international community, as the smallest and the most isolated country within the former communist countries of Eastern and Central Europe (CCEE). What made the country more notorious was its maverick behaviour in foreign policy and the rigid domestic policy. Thus, this small country so very similar and different at the same time, from other communist countries, and very difficult to have access to, remained for a long period a mystery.

Alongside this unpredictable political policy, the country was often referred to in the social sciences as being very successful in improving health and achieving a high life expectancy at birth by the late eighties (Mesle,F. 1991; Meksi and Dalla Zuanna, 1994, p. 608). But, as with its political and other aspects of the Albanian society, this achievement still remained a 'doubtful and enigmatic' one. The

lack of knowledge and information on the country and in particular of its social system, created the base for these doubts and sometimes speculations. Adding to this 'doubtful' achievement was the fact that contrary to the rest of Eastern Europe, during the eighties, instead of experiencing a reduction of life expectancy at birth, or at least an increase of adult mortality, Albania experienced an improvement in life expectancy at birth.

One of the most often mentioned 'speculations' concerning Albania is that of Peggy Watson in "Explaining rising mortality among men in Eastern Europe" (Watson, 1995). The author, while trying to identify the specific characteristics of the social context which have caused rising mortality among men in Eastern Europe, makes a remarkable effort in explaining this health crisis as an outcome of the unsuccessful struggle of socialism to modernise itself in a more global context. Based on this, the author concludes that:

> "Eventually external standards adopted from what could be seen of the West, came to be the main criterion for self-evaluation. The daily frustrations caused by this mismatch or 'incongruity' between aspirations and economic performance were, moreover, fused with deep political resentment and a sense of helplessness". (Watson, 1995, p. 928-9)

In supporting this conclusion the author gives an indirect evidence, that of Albania, where adult mortality instead of rising, went down.

> "It is significant for example, that in Albania, the only Eastern European socialist country to be effectively **sealed off** from the West during the post war period, the mortality rate for adults aged 40-59 years was 3.81 per 1000 in 1989, substantially less than in all other Eastern European countries where the corresponding rate varied from 6.68 (Czech Republic) to 9.67 (Hungary)....(Watson, 1995, p. 928-9)

So, to support her argument, the example of Albania was chosen, where the country was very isolated (sealed off), and there were no Western standards to be matched. As a consequence there was no frustration and no sense of helplessness. If nothing else, this conclusion shows clearly that one thing is unique about the country - the fact that there was a lack of knowledge and information, which led to a lack of publications, and sometimes to conclusions like the one mentioned above. But, among others, the mistake the author of this article makes is that she looks at the Albanian mortality experience, only as part of Eastern European experience, and not as part of the Mediterranean

experience, where a very low adult mortality, compared to the rest of Europe, has long been present, attributable to diet and life style factors.

However, despite the different mortality experience of Albania compared with the rest of the CCEE in the eighties, Albania had many factors in common with these countries, which influenced its mortality transition. In most of the socialist countries of Eastern Europe, after the WWII, the social agenda was a priority of their governments' policies. Substantial investment was made in health care. It is known that inequalities in health could be considered as the 'outcome' of different policies that can be measured by different mortality indicators. But, also inequalities in health have to do with the 'inputs' to health services: doctors, nurses, health care expenditure, etc. (Abel-Smith et al, 1995).

In Albania, as described in Chapter 2, health care became a priority of the communist government, which invested more in it than in other sectors of social life. As a consequence, in 1970 the number of physicians increased to 7.4 per 10,000 people, compared to 1.1 in pre-War Albania, and in 1990 it reached 17.1 physicians per 10,000 people. A large number of new hospitals were built, with the number of beds increasing from 1 per 1,000 people in pre-War period to 4.1 in 1970, and 5.9 in 1990. The health expenditure as a percentage of total government expenditure increased from 1.0% in pre-War Albania to 6.6% in 1990. Other improvements in health care were detailed in Chapter 2.

Another part of the improvements in the social fabric was improvements in education. As described in Chapter 2, after WWII Albania was a very backward country with a rate of illiteracy of 80%, which was higher among women. At the end of eighties, Albania had a rate of illiteracy of less than 5%, placing it among the developed countries.

The significance of education as one of the determinants of health transition is now well established. Thus, Preston in 1976 (Preston, 1976b) found that mother's literacy makes a difference to children's survival. Later on, in 1986, Caldwell found education to be one of the main factors in explaining mortality differences in some developing societies (Caldwell, 1986). He also emphasised the role of women's education and emancipation in preventing illness and providing good health in some developing societies (Caldwell and Caldwell, 1991). Even some of the most severe critics of Albanian communist regime, acknowledged that "Albania's single most impressive post-war achievement was the expansion of its educational facilities" (Logoreci, 1977, p. 69).

One of the common factors affecting health and mortality among former communist countries is the

relatively flat income distribution. In a large number of studies, it is mentioned that equity of income distribution is a very important factor that influences the health status of a population (Wilkinson, 1989, 1992). It was described in Chapter 2 that Albania had one of the most equal income distributions of all East European countries. Thus, the ratio between the average highest salary and lowest salary was around 1:2 (Bollano, 1984, p. 21). Other important common factors that affected mortality in former communist countries were equal access to health system and full employment of the population, which is supposed to reduce stress.

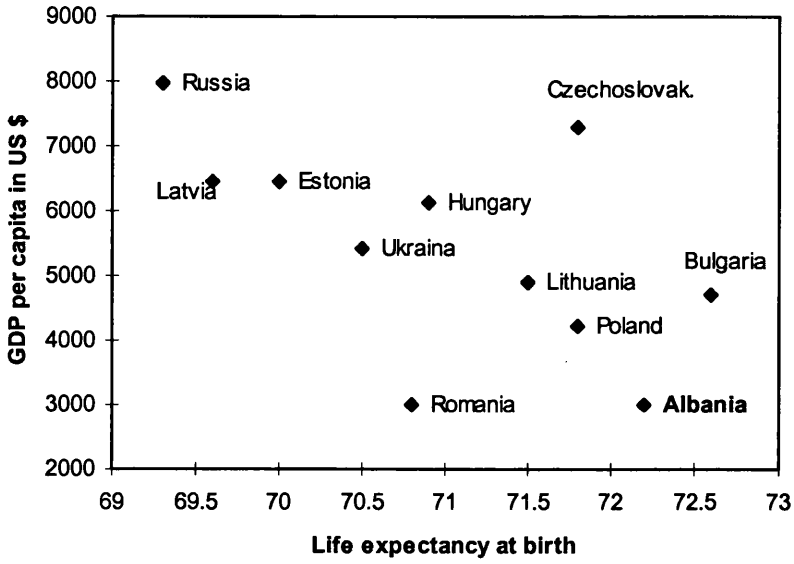
7.12 Albania - as part of the countries with "good health at low cost".

In the early 1990s it became almost as a cliché to address Albania as 'the poorest country in Europe'. Most of the reports on the country started by pointing out the extreme poverty in Albania, a country which was a mystery for almost 40 years.

Different measures of growth, such as GNP or GDP tend to underestimate the income of a subsidised economy. There are further difficulties in assessing income in so-called command economies, where prices are notional. Thus, a better indicator to compare growth is the purchasing-power parity (PPP) income, which is an income indicator adjusted for purchasing power. The different results coming from these indicators cannot be better explained than with the case of Albania. Thus, in 1990 GNP per capita in Albania was estimated by World Bank as low as $ 380 per capita (World Bank 1996, p.172), while PPP per capita was estimated at $ 3,000 in UN publications (United Nations 1993). Figure 7.1 shows a comparison of Albania with some selected East European countries, with reference to life expectancy at birth and PPP per capita.

Figure 7.1 shows that Albania has a high life expectancy at birth in 1990 (one of the highest in Eastern Europe), but one of the lowest PPP per capita. Adding to this point the fact that this low level of mortality was achieved in not just a country with a very poor economy and practically no growth in the eighties, but also in a country where technology transfer, from West as well as from East, was prohibited by law from 1976 onwards (Kuvendi Popullor, 1976, art. 14, 28). In terms of physical infrastructure and urbanisation, the country was extremely poor and can be compared to some North African countries, such as Morocco or some Asian countries, such as Sri Lanka, the Indian State of Kerala, and Yemen.

Figure 7.1 Life expectancy at birth and PPP/capita for selected CCEE, 1990



Source:Human Development Report (1993) - UNDP

By looking at the level of economic performance and health achievement, Albania can also be classified as one of the countries which achieved 'good health at a low cost'; countries such as Sri Lanka, the Indian State of Kerala, and Costa Rica. Similar to those countries Albania is an underdeveloped country, with a very poor economic performance, but which has achieved a relatively high life expectancy at birth.

Albania can be compared to these countries, not just because of its economic and health performances, but also because Albania, similar to these countries, has not yet completed its demographic transition. The level of total fertility rate is the highest in Europe for about 3 children per woman. As in those countries, Albania also has relatively high infant mortality rate, and the pattern of causes of death is relatively similar. Albania has low rates of deaths from diseases such as cardiovascular diseases, breast cancer and cirrhosis, which are usually associated with developed and industrialised societies (including the countries of CEE). Albanian society in the nineties has still remained very traditional and its population is concentrated mainly in the rural areas.

As with the comparison with East European countries, in these countries health issues were 'high' on the political agenda of their governments. Substantial investments were made in primary health care. Education was also found to be one of the main factors behind the mortality improvements in these countries (Caldwell, 1986). All this is similar to the experience of Albania.

One important aspect of health improvements in these countries is the fact that the wealth of the nation is not the only factor that influences the individual's health, but also how this wealth is distributed among individuals (Halstead et al. 1985, Wilkinson. 1989). A number of studies show the

great importance of income distribution for the health of a population. This is probably because inequality in income distribution is likely to be associated with inequality in access to health and social services, education and in a number of other aspects of society relevant to health status, as well as affecting health through stress, etc. Comparing Albania with these countries helps to shed some light in explaining the mortality transition in Albania from 1950 to 1990.

7.13 Albania - as part of south European countries, with a Mediterranean diet and life style.

When Albania is analysed in the social sciences, an important dimension of comparison is often forgotten, - the fact that Albania is also one of the Mediterranean countries. By being part of the Mediterranean cultural zone, the diet and life-style factors that are present in other Mediterranean countries are also found in Albania.

During the mortality transition, as mortality falls, life style becomes very important in improving mortality at adult and old ages. A healthy diet has been thought to prevent a number of illnesses, while excessive drinking and smoking, are thought to cause damages to health of individuals. In the last thirty years, a large number of scholars have increasingly emphasised the importance of diet and life style. Thus, Marmot et al found out that smoking is a significant cause of mortality differentials (Marmot, Shipley and Rose, 1984). They also argued that differential mortality rates across classes are high even within smoking sub-samples.

Different studies related to the Mediterranean countries, such as the 'Seven Countries Study' (Keys et al, 1986) and other recent research (Helsing, 1995; Kushi et al. 1995a, 1995b) have shown the positive effects of Mediterranean diet on adult mortality, especially mortality caused by cardiovascular diseases, which are particularly affected by the dietary patterns of a population. Thus, the diet of Mediterranean people is associated with long life expectancy and low rates of occurrence of coronary heart diseases.

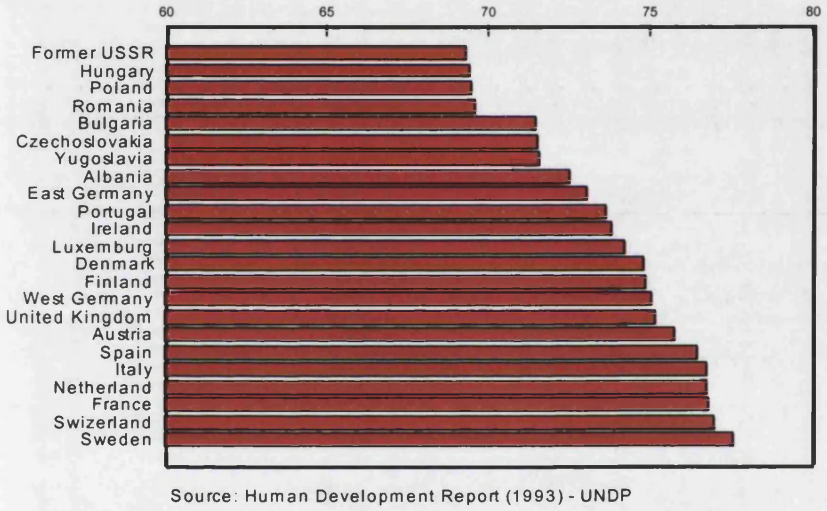
Albania, because of its geographical position has a Mediterranean diet, which will be detailed later in this chapter. This diet, which is shaped by the climatic conditions, environmental constraints, and so on is mainly found in its traditional patterns in Albania, because the country was 'closed' for almost 40 years. Traditional dietary patterns are particularly common in rural areas, far from the influence of modernisation of the food supply.

7.2 COMPARISON OF TRENDS AND PATTERNS OF MORTALITY

As previously mentioned, Albania has one of the highest life expectancies at birth in Eastern Europe, but one of the lowest PPP measures of income per capita. But, when the infrastructure of the country is considered, the scale of the high poverty becomes more apparent.

This paradox is examined in Figure 7.2, which compares Albania with other European countries, in terms of achievement of life expectancy at birth in Europe.

Figure 7.2 Life expectancy at birth, Albania and other European countries - 1989-1991



Source: Human Development Report (1993) - UNDP

From this figure it is clear that Albania has a relatively high life expectancy at birth, comparable to the levels of much more developed countries of Europe. In 1990, the country's life expectancy at birth was well above 70 years and higher than far richer countries, such as Hungary, Poland, Yugoslavia or Czechoslovakia.

Despite the fact that Albania had a high life expectancy at birth, this shows only that the country had a low overall mortality. It is of particular interest to see how comparable is the more detailed Albanian pattern of mortality to some of these countries.

As outlined above, the comparison of Albanian mortality can be well grassed along three dimensions. Table 7.1 details the mortality comparison of Albania on these three dimensions. There are three groups of countries that are compared with Albania in this table; first, some selected countries of Eastern and Central Europe; in the second group are countries of South Europe with similar Mediterranean influences, and in the third, a number of developing countries with good health achievements.

The comparison involves indicators of both child mortality, through the probability of dying at ages 0 - 5, and adult mortality, through the probability of dying at ages 15 - 60. The ${}_nq_x$ values are calculated for both sexes separately. The years chosen for this comparison are in the mid-eighties, predominantly 1987. This year was chosen for two reasons: first, because for 1987 we have detailed information for cause-specific mortality in Albania; and second, because for the same year some good estimates of mortality by cause are provided for those countries by Murray et al in in their work *'The Health of Adults in the Developing World'* (Feachem et al. 1992).

Table 7.1 Child and adult mortality estimates of Albania and other countries.

in %

Country	Year	${}_5q_0$		${}_{45}q_{15}$	
		Male	Female	Male	Female
Albania	1987	4.9	4.5	13.7	7.4
Countries of Central and Eastern Europe					
Bulgaria	1987	2.0	1.6	20.6	9.5
Czechoslovakia	1986	1.7	1.3	22.8	10.0
East Germany	1985-90	1.1	0.7	17.9	9.2
Hungary	1987	2.2	1.7	27.7	12.7
Poland	1987	2.1	1.6	24.8	10.3
Romania	1984	3.3	2.7	22.4	11.5
Soviet Union	1985-90	3.5	2.6	26.8	11.0
Yugoslavia	1987	3.0	2.7	19.8	9.8
Selected South European Countries					
Greece	1986	1.4	1.21	12.0	6.0
Italy	1985	1.3	1.0	14.4	6.7
Portugal	1987	1.8	1.5	17.5	8.1
Spain	1985	1.1	0.9	14.1	6.1
Selected Developing Countries					
China	1986	4.4	3.3	16.6	14.9
DR of Korea	1985-90	4.6	3.5	21.4	12.3
Sri Lanka	1983	4.3	3.9	22.5	12.7
Cuba	1986	1.9	1.5	15.0	11.2

Sources: Data on Albania are calculated by the author. The others are estimates of Murray, Yang, and Qiao (1992) in "The Health of Adults in the Developing World" 1992, R. Feachem et al, *ed.*

Looking at the data on child mortality, Albania has the highest ${}_5q_0$ for both sexes. The values of

levels of infant and child mortality are similar to those found in the selected developing societies, reflecting the poverty of these societies. In contrast, Albania has remarkably low adult mortality, which from its values is comparable to the Mediterranean countries, which are known to have some of the lowest values of adult mortality in the World.

7.3 COMPARISON OF CAUSE-SPECIFIC MORTALITY

It was mentioned above that 1987 was the year chosen for this comparison of Albania with other selected countries because of the availability of the data by cause of death for ages 15-60. The data on Albania are those given in Chapter 5 for some of the main causes of deaths. While for the other countries, estimates are those of Murray et al, in the *'Health of adults in the developing World'*. As previously mentioned, the success of Albanian mortality is mainly in its very low levels of adult mortality. That is why this comparison by causes of death will be based only in the adult ages, so that the changes of the disease pattern can be analysed between Albania and the other countries.

Table 7.2 Cause-specific comparison of adult mortality, Albania and other countries.

7.2a. Males

Countries	Years	${}_{45}q_{15}$		
		Cardiovascular Diseases	Cancers	Respiratory Diseases
Albania	1987	4.1	3.5	0.6
Central & Eastern European Countries				
Bulgaria	1987	7.8	4.6	0.5
Czechoslovakia	1986	8.2	6.3	0.6
Hungary	1987	9.4	6.6	0.7
Poland	1987	9.1	5.7	0.5
Romania	1984	7.5	4.3	1.1
Yugoslavia	1987	6.2	4.6	0.4
Selected South European Countries				
Greece	1986	4.1	3.5	0.3
Italy	1985	3.9	5.0	0.4
Portugal	1987	3.6	3.8	0.5
Spain	1985	3.7	4.2	0.5
Sri Lanka	1983	5.0	1.4	0.7

7.2b. Females

Countries	Years	$_{45}q_{15}$		
		Cardiovascular Diseases	Cancers	Respiratory Diseases
Albania	1987	2.5	1.7	0.2
Central & Eastern European Countries				
Bulgaria	1987	3.4	3.2	0.1
Czechoslovakia	1986	2.9	4.0	0.2
Hungary	1987	3.9	4.3	0.3
Poland	1987	3.3	3.9	0.2
Romania	1984	3.9	3.4	0.4
Yugoslavia	1987	3.1	3.2	0.2
Selected South European Countries				
Greece	1986	1.4	2.7	0.1
Italy	1985	1.4	3.2	0.1
Portugal	1987	1.8	2.9	0.2
Spain	1985	1.4	2.7	0.2
Sri Lanka	1983	2.3	1.8	0.6

Note: the $_{45}q_{15}$ values are the net probability of dying at ages 15-60.

Table 7.2 gives the probability of dying at ages 15-60 for the same groups of countries for three main causes of death - cardiovascular diseases, cancers and the respiratory diseases.

The comparison for males in 7.2a shows that with regard to cardiovascular diseases, Albania has a much better record than all Eastern European countries. Thus, the net probability of dying for cardiovascular diseases in Albania in 1987 is 4.1 (in percentage), while the closest value from the CCEE is that of Yugoslavia at 6.2. While in Czechoslovakia, Hungary and Poland, cardiovascular diseases cause more than twice the deaths in Albania. It is interesting to find out again, that as in the comparison of adult mortality at Chapter 6, Albania has closer values to the Balkan countries, than to the more north-eastern countries of Eastern Europe with reference to cardiovascular diseases for males.

With regard to deaths caused by cancers for males, Albania again has lower mortality than any Eastern European country. Deaths from respiratory diseases, are more or less similar to these countries which suggest again the common factors among these countries, that shaped their social agenda, especially with reference to health. This is also true when the comparison is extended to Sri

probability of dying (4.9 for males and 4.5 for females in %) are much higher, not just compared with South European countries, but higher than all the countries of Central and Eastern Europe. The only countries where child mortality rates are close to the Albanian rates are China, DR Korea and Sri Lanka, with ${}_5q_0$ values respectively of 4.4, 4.6 and 4.3 % for males, and 3.3, 3.5 and 3.9 % for females. Despite the fact that their child mortality is high, when compared to Albania, it is still lower.

Another picture altogether can be seen when adult mortality is considered. Albania has a very low adult mortality rate, respectively a ${}_{45}q_{15}$ of 13.7 % for males and 7.4 % for females. These values are much lower than anywhere in the countries of CEE, where the average ${}_{45}q_{15}$ is for males 22.9 % and for females 10.5 %. Even when adult mortality is compared with some of the developing countries which have a similar life expectancy at birth, these values are still much lower (e.g. compared with China, Cuba, and Sri Lanka).

What is more significant about the data given in Table 7.1 is the fact that Albanian adult mortality is very similar to that of the south European countries, given there. Female adult mortality is better than Portugal, but slightly worse than Italy, Spain and Greece, but the male rate is lower than all countries except Greece. Thus, in other words, Albanian adult mortality is much more similar to countries of southern Europe than to other countries of CEE, or the developing countries that were selected for this analysis.

While discussing adult mortality it is interesting to note that with a high infant mortality (the highest in Europe), Albania still has a relatively low female adult mortality (which to a certain degree suggests low maternal mortality). That is relatively low when compared with the countries of CEE, which have a much lower infant mortality, but a much higher female adult mortality. On the other hand, this could be the reason why Albanian female adult mortality is higher than in Spain, Greece or Italy, where male adult mortality is similar or even worse than in Albania. However, this remains an assumption which needs further research.

Concluding this analysis one can say that Albania has a lower overall mortality compared to other countries with similar economic and social achievements. This applies not just to some developing countries such as China or Sri Lanka, but also to countries of Central and Eastern Europe, which had a better economic development by the end of the communist reign in these countries. Despite the achievements in overall mortality, infant and child mortality, even after undergoing dramatic changes, it is still high, not just by Western standards, but also when compared with the countries of CEE. The

Lanka. The comparison for females shows that for cardiovascular diseases and cancers, Albania has lower death rates than all Eastern European countries.

A very different story emerges when Albania is compared with South European countries. The male comparison shows that Albania has the same values as Greece for mortality caused by cancers and cardiovascular diseases, and values close to the other Mediterranean countries. When female mortality is compared with that of South Europe, Albania does worse with regard to cardiovascular diseases, and much better with regard to cancers. A further interesting aspect of the female comparison is that Albania has the same ${}_{45}q_{15}$ values as Sri Lanka for cardiovascular and cancers deaths.

What one can say about this comparison is that first, Albania does much better than all Eastern European countries with regard to cardiovascular diseases and cancers for both sexes. While the comparison with south European countries shows that, for males, Albania has the same cause-specific pattern, while for females it is slightly different. The female pattern is more similar to that of Sri Lanka. It is known that both these diseases, in particular the cardiovascular, are very much related to the dietary pattern and life style of the populations. Thus, this analysis suggests again that even when causes of death are considered Albania shows the pattern of a Mediterranean country, where the influence of dietary pattern and life style factors shape the adult cause-specific pattern. However, what is different about Albania is that the female pattern is also similar to that of Sri Lanka, which might also suggest that as with Sri Lanka and other developing countries, the mortality transition in Albania has not completed its last stage, and the move from infectious and parasitic diseases to cardiovascular diseases and cancers has not totally been completed.

However, there are two reasons not to support this argument. First, this similarity to Sri Lanka and other developing countries is found only among females, and not for males. Second, the transition to low rates of infectious and parasitic, as well as respiratory diseases has occurred in Albania. This also causes the very low rate of adult mortality among males and females in Albania. There is not enough evidence to define that the health transition in Albania is not completed. What we might find there is a combination of the influences of factors, such as diet and life style factors with factors related to the traditional values found is societies such as Albania, Sri Lanka and others, which keep females from exposure to some risk factors that are prevalent in more developed societies.

7.4 CONCLUDING NOTES

It is very difficult to give a precise assessment of the impact of different factors to changes of mortality, being these social and economic improvements or diet and life style factors. The difficulty comes from first, the need for individual data relating mortality and these factors, and second from the broader meaning of these factors. However, by trying to position Albania, in terms of mortality trends and patterns in an international perspective, this chapter gives some suggestions of the factors behind the mortality improvement in Albania during 1950-1990.

One of the main findings of this chapter was that with regard to infant and child mortality Albania had more similarities to some developing countries such as Sri Lanka or China, which are often seen as doing well in terms of overall mortality, but still have relatively high infant and child mortality. The fact that these countries have similar economic performance to Albania is not the only factor in common. Other factors affecting the health transition in these countries have also influenced the Albanian transition, factors that have been examined by different scholars in the past 20 years (Preston, 1976b, Caldwell, 1986 and 1991, Halstead et al. 1985, Wilkinson in 1989 and 1992 etc.). These include improvements in education, with particular reference to female education; improvements in health system, with particular reference to primary health care; relatively equal income distribution.

Despite these similarities between the Albanian mortality transition and the transition in these countries that had 'good health at low cost' there are differences. Albania had very low adult mortality for both males and females, similar to the levels of some Mediterranean countries, which are far richer than Albania and generally more advanced in terms of development. This similarity, shown also in the cause-specific patterns, suggests that factors that shaped the mortality pattern in these countries, should also have shaped the mortality pattern in Albania.

As described in this Chapter, the healthy Mediterranean dietary patterns and other life style factors that are present in these countries have also shaped the Albanian pattern. These diet and life style factors are proven to have a major effect in the health of the Mediterranean populations (Marmot et al. 1984, Keyes et al. 1986, Kushi et al. 1995 and 1995 etc.). It is interesting to see if these factors are present in Albania, too. Thus, Figure 7.3 shows some of these similarities between the Albanian dietary pattern and these Mediterranean countries.

Clearly Albanians benefited from eating a rather extreme version of the classic Mediterranean diet, now widely recommended by nutritionists. Some information on the calorific intakes and the contribution of animal products in the diet in Albania, along with the same information for some selected Mediterranean countries, are shown in Figure 7.3. Overall the calorific intakes in Albania is slightly below the other Mediterranean countries, but with 3115 calories per day, is sufficient enough in most cases. The contribution of calories by animal origin is only 12% of the overall the calorific intakes and far lower in Albania than elsewhere in Europe. On the other hand, calculations from FAO (FAO, 1994) show that total average calories per day in 1990 in countries of CEE were 3490, where 975 were from animal origin or 27% of all calorific intake in these countries. Statistics show that the consumption of meat and other animal products is very low in Albania. Albanians eat only 75 grams of meat per day. This is less than half of the next lowest figure in Europe (WHO, 1993, p. 19). The country also occupies the last position in Europe in terms of consumption of fats and oils. Moreover, the use of olive oil is very wide spread, as previously explained in chapter 6. From Figure 7.3 it is also clear that the consumption of cereals and vegetables and fruits is high in Albania.

However, other life-style factors also played a positive influence in keeping Albanians healthy under the communism. Thus, alcohol consumption was low in Albania compared to other European countries; smoking was rare among women and young ages, although common among men[1]; being an agrarian society, meant that at least 65% (the rural population in 1990) of the population was involved in physical labour. Moreover, the lack of private transport necessitated Albanians taking regular exercises simply to carry out daily activities (WHO 1993. P. 24, UNICEF 1994, 67). Concluding this analysis, it can be said that the very poverty of their circumstances was, paradoxically, a significant factor in keeping Albanians healthy. This is clearly an ironic situation, to say the least.

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[1]It is difficult to judge on the influence of factors such as smoking and alcohol consumption. This difficulty comes primary because of the lack of accurate information. As with other factors there are no individual data that relate these risk factors to mortality. Moreover, aggregate data on smoking are lacking for Albania. While the data on alcohol consumption are very dubious. Albania still remains a traditional society, where a large amount of alcohol is still produced at home (in 1989 64% of population was rural). Thus, the published data include only information on alcohol production in state enterprises, leaving out the home production. So far there has been no efforts to estimate the alcohol production at home.

Figure 7.3 Comparison of Albania and selected Mediterranean countries in the consumption per capita, of main food products in the 1990s.

GREECE, ITALY, SPAIN, PORTUGAL 2)

5. Meat and offals.
224g/pc/pd

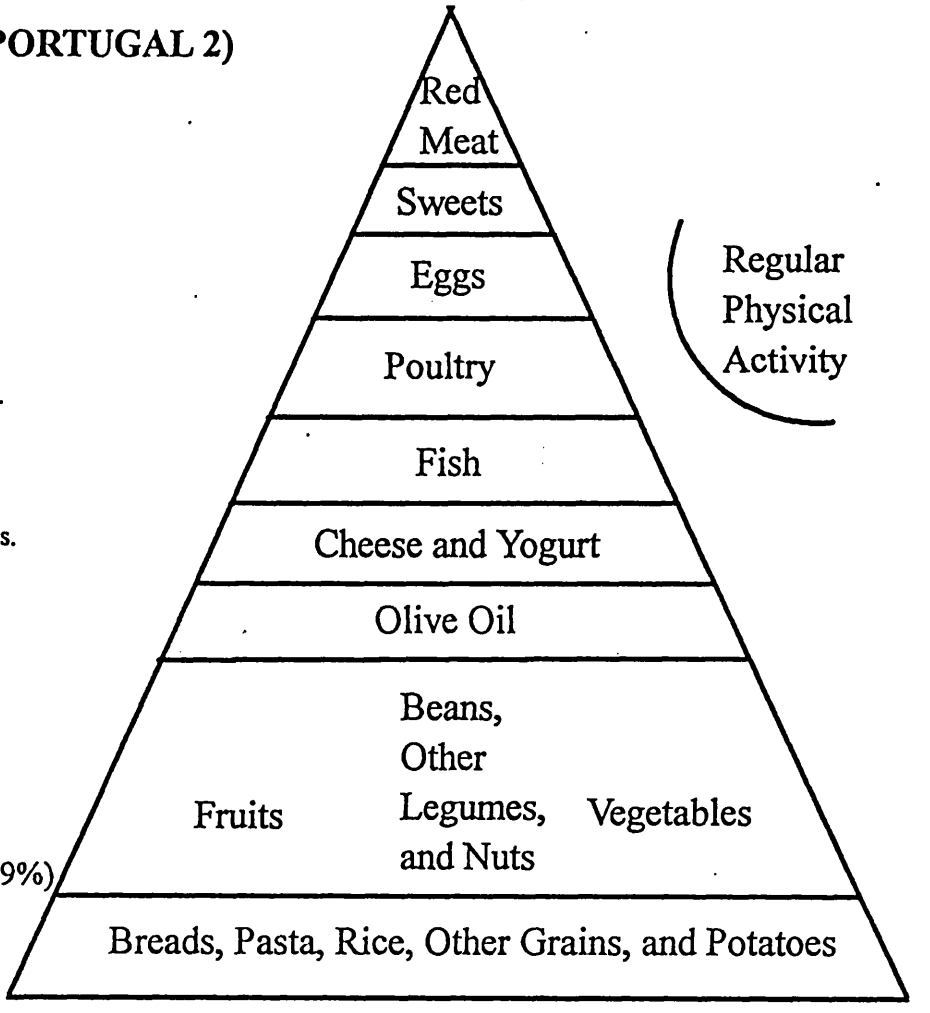
4. Milk and its products.
550g/pc/pd

3. Total separated fats & oil.
85g/pc/pd

2. Vegetables, pulses & fruits.
850g/pc/pd

1. Cereals & starchy roots
580g/pc/pd

Total Calories - 3624
a. of vegetable origin - 2648
b. of animal origin - 976 (26.9%)



ALBANIA 1)

5. Meats and offals.
75g/pc/pd

4. Milk and its products.
400g/pc/pd

3. Total separated fats & oil.
50g/pc/pd

2. Vegetables, pulses & fruits.
610g/pc/pd

1. Cereals & starchy roots
622g/pc/pd

Total Calories - 3115
a. of vegetable origin - 2741
b. of animal origin - 374 (12%)

The Traditional Healthy Mediterranean Diet Pyramid

1) Data on Albania refer to 1993 - Living Standart Survey, 1993. Institute of Statistics, Tirana

2) Data on Mediterranean countries refer to 1990. Source of data, FAO 1994

Chapter 8. CONCLUSIONS AND AN AGENDA FOR FUTURE RESEARCH.

8.1 Main Findings.

As outlined in the introduction, the main goal of this research was to document the mortality transition in Albania over the period 1950-1990, the period under communist rule, but also the period that data were available with regard to mortality.

Albania experienced considerable improvements in overall mortality, with life expectancy at birth increasing from 51.6 years in 1950 to 70.7 years in 1989. This achievement was accomplished in the situation of a very poor economy, which at the end of the eighties, and still today, remains by far the poorest in Europe. This achievement reflects two main factors. First, despite the fact that the country was very isolated and completely sealed off from the West as well as from the East in later years, this achievement was part of the global process of public health improvement, which has occurred in many developing countries worldwide in the second half of this century. Second, this rapid improvement also reflects the high priority given by the communist government to health care and other aspects of the social agenda, which directly or indirectly, influenced the health transition in Albania during 1950-1990.

The greatest improvement occurred in infant and early child (1-4) mortality, which for the period under consideration, 1950-1989, improved respectively from 143 and 105 deaths per thousand to 45.4 and 15.5 deaths per thousand in 1989. Despite this radical improvement, infant and child mortality in Albania remained relatively high. At the end of eighties, as well as today, Albania still has among the highest infant and child mortality rate in Europe. These levels of infant and child mortality rates, very high by European standards are, however, similar to some other developing countries, such as Sri Lanka and China.

With regard to improvements in infant and child mortality, Albania has had similar experience to developing countries which are regarded as achieving "good health at low cost". Thus, factors that gave priority to the social agenda accounted for the scale of this improvement (Halstead et al. 1985; Caldwell, 1986). As explained in Chapters 2 and 7, the priority given to health care by the government, in particular to the health of mothers and children, the improvement in education, particularly for females, changes in the social security system, and the equality of the income distribution, were among the factors that accounted for changes in mortality in all of these countries.

However, despite the improvement of infant and child mortality, their relatively high levels at the end of the eighties in Albania probably reflect the continued inadequacy of medical care, especially emergency care, as well as the poor infrastructure that prevented most of the rural population (especially in highland Albania) from having effective access to emergency medical assistance. These considerations reflect the poverty of the country.

One particular circumstance that can be contemplated for high infant mortality in Albania is the very high level of fertility in the country. Throughout the period under consideration Albania had a very high fertility level with a TFR of 7 children per woman in 1960, and 3 children per woman in 1990. There are a lot of parallels that can be drawn between infant mortality and fertility changes. First, similar to infant mortality changes, fertility came down dramatically during 1950-1990. The dynamics of both indicators can partially attributed to the improvement of female education. The high level of both indicators at the end of the eighties can also be attributed to the same factors. Despite the move of Albanian society from a traditional one to a relatively advanced society (where female education and employment became universal), the explicit policies of reducing fertility and infant mortality cannot be successfully implemented unless they are accompanied by a general level of development of all aspects of social and economic life.

In sum, with regard to infant and child mortality changes, Albania went through the same "route to low mortality" as other successful developing countries, as detailed by different scholars, such as Caldwell (1986) and Halstead et al (1985).

In contrast to infant and child mortality, adult mortality in Albania is amongst the lowest in Europe. That is to say among the lowest in the world. The death rates for ages 15 to 60, shown in Chapter 4 and 7, are similar to far richer countries of Southern Europe, such as Italy, Spain, Portugal and Greece. The very low adult mortality in Albania, as in these countries, reflects the impact of factors such as diet and life style, which are widely regarded as accounting for the very low adult mortality of Mediterranean populations. After the elimination of infectious diseases in the fifties and sixties, Albanian cause-specific adult mortality shows the same pattern as in other Southern European countries, with low death rates from cardiovascular diseases and cancers. In contrast, in terms of adult mortality, Albanian experience is quite different from that of the other poor developing countries, which have achieved "good health at low cost". In this respect, Albanian experience might be considered as a different "route to low mortality" for a developing country.

Chapter 3 described the lack of individual data in Albania during 1950-1990. In such circumstances any effort to try and find a causal mechanism for deciding on the influence of different factors to mortality improvement, is limited. Nevertheless, the analyses carried out in this work enables us to select and determine on main factors that have contributed to the Albanian mortality transition.

Without any doubt education was important in bringing mortality down in Albania, especially the mortality among infants and children. The fact that the infant mortality rate improved by around 97 deaths per thousand, and the child mortality rate by about 89 per thousand, while Albania moved from a country with an illiteracy rate of 80% in mid-forties to less than 5% in 1990, strongly suggests that education has played an important role. The improvement of education for women was also evident in the changes of maternal mortality shown by changes of ${}_{45}q_{15}$ for females.

Another important factor considered for mortality improvements in Albania is the priority given by government to health care. Explicit policies aiming at the improvement of child and mother health were applied. Large investments were made by the government in order to create an extensive health system, with a particular focus on the development of primary health care. Thus, health care became freely available to all. A new social security system, which became universal during the period under consideration, can also be counted as relevant to the improvements in mortality. So can the new policy aiming at equal income distribution, which made Albania the country with the flattest distribution of incomes in the former Eastern Europe.

However, the distinctive pattern of Albanian mortality, with very high infant and child mortality, but very low adult mortality, suggests that other explanations, beyond social and economic factors, should be also accounted for this success story. This argument was strongly supported by the similar cause-specific pattern of mortality in Mediterranean countries such as Greece, Italy, Portugal and Spain, where low death rates from cardiovascular diseases and cancers are widely attributed to the Mediterranean diet and life style. This suggestion was supported by the similar dietary patterns between Albania and these countries, where low intakes of saturated fats and high consumption of fresh fruits and vegetables account for the low mortality among adults. Moreover, the evidence on regional differences of adult mortality within the country and the comparison with different regional dietary patterns indicated by the production and consumption of olive oil in Albania, further supports the importance of diet is shaping the Albanian mortality pattern.

Data on dietary patterns, although not available at an individual level, can be examined on an

aggregate level. However, other aspects of life style, such as smoking and alcohol consumption were difficult to analyse, because of the lack of individual data and defective aggregate data. Nevertheless, certain lifestyle issues are clear. For example, one cannot neglect the fact that the Albanian population has remained very rural, with 64 % of the population was living in rural areas in 1989. This suggests that most of the Albanian population was involved in manual labour. This fact, together with the lack of private transport (affecting the life style in the urban areas) made Albanians maintain an active life style.

Another interesting finding of this work is related to the regional differences of adult mortality in the Balkans. Scholars have suggested two major regional differences in mortality in Europe. One is the difference between Eastern and Western Europe (Bobak, M. Marmot, M. 1996), while the other is the North-South difference in adult mortality levels and patterns, even found within European countries, such as France or Italy. The analysis of Chapter 6 suggests that both these dimensions of mortality differentials in Europe are reflected in the Balkans, and even within Albania itself. Thus, a south-west to north-east gradient of adult mortality exists in the Balkans, with mortality in the south-west being lower than in the north-east. This division which we believe to be a result of different dietary and life style patterns, needs further investigation.

The successful story of Albanian mortality cannot be told without drawing the parallels to other developing countries, where a wide range of factors which were mentioned here and in other parts of this research all count. However, what makes this story particularly appealing, is the fact that in contrast from previous research, this analysis of Albanian mortality transition shows that factors, such as diet and life style, attributed to mortality changes in developed countries, can successfully be implemented in developing countries.

8.2. Epilogue - Albania after 1990.

The period covered by this research 1950-1990, was the period of the communist regime, which collapsed, shortly after other Eastern European countries in 1990. As in all post-communist countries, the last years of communism and the first years of the new democracies were accompanied by massive economic and political problems. In the early 1990s Albania went through a hard economic and social period. The GNP per head fell over by 40 % in 1990 and 1991, and the country was reliant on foreign aid, which was mainly in the form of large supplies of food and medical supplies. In 1992

and 1993, Albania received more food per head than any other country in the World (UNICEF 1994, p. 77).

In the following years, Albania started building up its economy, until late 1996 and 1997, when the country was overwhelmed by an economic and financial crisis, which ended in civil unrest. This civil unrest, that continued for a period of more than six months, did not just stop the growth of economy that started in 1994 and 1995, but also claimed more than 2,000 lives. In such circumstances it is difficult to establish the demographic changes of the country. Mortality and health statistics have been lacking, and the only figure coming out is that of life expectancy at birth in 1993 of about 73.0 years (INSTAT, 1996). It is difficult to judge the accuracy of this figure, since age-specific death rates are not published. In addition, it is difficult to picture what is happening to the mortality transition in a country where during 1997 more than 2,000 people were killed (12 % of the total deaths of the previous year) as a result of civil unrest (INSTAT, 1998). The estimation of mortality rates has also become more difficult because of the high emigration from the country during 1990-1997, which amounts for 15% of the total population of Albania in 1997[1]. In such circumstances one can only speculate about the changes in health and mortality of the Albanian population over this period.

Although, it is very difficult to foresee what is going to happen after this crisis, while the country is still in it, a few words on probable changes of the future might be of interest.

It is very difficult to forecast any improvement of overall mortality in Albania in the coming years. This is because the determinants that have shaped the mortality transition in Albania have changed and are expected to change. Thus, in terms of economic performance, the level of GDP has still not reached the 1990 level (INSTAT, 1998). Social changes have been slow and the impact of government has diminished. Government investment in the health care system has gone down, and most of the country's health centers rely on foreign aid. Other factors, such as diet and life style factors are assumed not to change rapidly in a period of eight years. Thus it is believed that the effect of these factors on mortality will not change, at least in the near future. They will continue to be major determinants of mortality in Albania. As Abel-Smith noted 'to a large extent people are prisoners of their values and the values of the society they live in, and are limited by their economic and social environment quite apart from any health knowledge they may posses' (Abel-Smith et al,

[1]This figure is taken from a report of the Ministry of Labour and Emigration of Albania, May 1998.

1995).

8.3. Future research.

As this thesis has shown Albania has had a unique health transition. Yet its story has implications for many other populations. Even with the detailed documentation of this thesis, there remain aspects of the transformation of Albanian health and mortality after 1950 that would benefit from further study. Perhaps most importantly for other European countries is the way in which diet can influence adult mortality. Few developed countries can match Albania's very low adult mortality, thus more detailed studies, possibly combining epidemiological and biological sampling could help identify the causal mechanisms at work more precisely.

A second potentially fruitful topic for further analysis is a more detailed examination of regional mortality patterns. Even the relatively basic analysis carried out here has identified a significant mortality gradient across the Balkans. Future work could detail this pattern more precisely and examine other populations in the Eastern and Southern Mediterranean. How similar will the Albanian experience seem, for example, to that of Turkey or the Maghreb countries, which are perhaps closer to Albania in their levels of development than many European countries?

Clearly this thesis is only the first step in using the history of health transition in Albania to gain insights that enhance our understanding of the process more generally.

REFERENCES

1. Abel-Smith, B., Figueras, J., Hollands, W., MkKee, M., Mossialos, E., 1995. *Choices in health policy: An agenda for the European Union.* Aldershot: Dartmouth.

2. Albanian State Archive, 1954. *Documents on State Planning Commission - Statistical Directory*, Fond 895, Year 1954, File 104, p. 1, 2.

3. Albanian State Archive, 1985-1990, *Documents on State Planning Commission - Statistical Directory*, Fond 895, Year 1985-90.

4. Anderson, B. A. and Silver B. D. 1989. "The changing shape of Soviet Mortality, 1958-1985: An evaluation of old and new evidence". *Population Studies*, 43, p. 243-265.

5. Anderson, B. A. and Silver B. D. 1989. "Demographic sources of the changing ethnic composition of the Soviet Union". *Population and Development Review*, 15, No. 4, p. 609-617.

6. Ash, W., 1974. *Pickaxe and rifle.* Howard Barker, Wimbledon.

7. Bajrami, H 1990. *Shperngulja e shqipetareve gjate viteve 1875-1966*, Rilindja, Prishtine.

8. Bates, M. 1941. "Field studies of anopheline mosquitos of Albania", *Proc. Ent. Soc. Wash.*, Vol. xliii, No. 3, p. 37-58.

9. Berxholli, A., Qiriazi P. 1986, *Albania: a geographic outline.* 8 Nentori, Tirana.

10. Bennett, N. and Horiuchi, S. 1981. "Estimating the completeness of death registration in a closed population", *Population Index* 47(2), p. 207-222

11. Blejer, M., et al. 1992. *ALBANIA - From Isolation Toward Reform*, IMF (International Monetary Fund), New York.

12. Biberaj, E. 1990. *Albania - A Socialist Maverick*, Westview, Boulder and London.

13. Bobak, M. and Marmot, M. 1996. "East-west mortality devide and its potential explanations: proposed research agenda". *British Medical Jounal*, No. 312, p. 421-25

14. Bollano, P. 1984. "The limitation of wage differentials", *Albanian Life, No. 29.*

15. Brass, W. 1979. "A procedure for comparing mortality measures calculated from intercensal survival with the corresponding estimates from registered deaths". *Asian and Pacific Census Forum* 6(2), p. 5-7.

16. Braudel, F. 1972. *The Mediterranean and the Mediterranean World in the Age of Philip II, Vol. II*, Collins, London.

17. Caldwell, J. 1986. "Routes to low mortality in poor countries", *Population and Development Review*, 12, No.2, p. 171-220.

18. Caldwell, J and Caldwell, P. 1991. "The roles of women, families and communities in preventing illness and providing health services in developing countries". *The epidemiolagical transition: policy, planing and implications for developing countries* (ed.) Gribble, J. N., and Preston, S. H., Washington D.C., National Academic Press, p. 252-271.

19. Caselli, G. 1996. "National Differences in Health Transition in Europe" *Historical Methods*, 29, No. 3, p.107-125.

20. Cikuli, Z., 1982. *Health Service in the PSR of Albania*, 8 Nentori, Tirana.

21. Coale, A. and Demeny, P. 1983. *Regional Model Life Tables and Stable Populations* (Second edition). Academic Press, New York.

22. Cullaj, A 1992. *Environmental situation in Albania*, Organisation for the Protection and Preservation of the Natural Environment in Albania. Tirana, Albania

23. Das Gupta, M. 1987. "Selective discrimination against female children in rural Punjab, India." *Population and Development Review*, 13, No. 1, p. 77-100.

24. Doll, R. And Peto, R., 1981. *The causes of cancers*. Oxford University Press, Oxford.

25. Drejtoria e Statistikes, 1970. *Vjetari Statistikor i Shqiperise"(Statistical yearbook of Albania).* Keshilli i Ministrave, Tirane, Albania.

26. EBNA (Editorial Board of 'New Albania'), 1984. *Albania,* 8 Nentori, Tirana.

27. FAO, 1994. *Food Balance Sheets. Rome.* Food and Agricultural Organisation.

28. Feachem, G. A. R., Kjellstrom, T., Murray, C. J. L., Over, M. Phillips, M. A. 1992. *Health of Adults in the Developing World*, A World Bank Book, Oxford University Press, New York.

29. Federal Statistical Office, (SYY) 1995. *Statistical Yearbook of Yugoslavia*, Belgrade.

30. Federal Statistical Office, 1950-1988. Demografska Statistika *(Demographic Statistics)*, Belgrade.

31. Frasheri, K. 1985. *The territories of Albanians in the XV century" at the Albanians and Their Territory*, 8 Nentori, Tirana, Albania.

32. Gazeta Zyrtare (Offical Newsletter) 23.12.1945, Law No. 19 dated 15 December 1944, Kuvendi Popullor, Tirane, Albania

33. Gazeta Zyrtare (Offical Newsletter)- 17/1953, Decree Nr. 1770, dated 3.12.1953, Article 2, Kuvendi Popullor, Tirane, Albania.

34. Geco, P., 1970. "L'accroisement de la population urbaine de la R.P d'Albanie et sa repartition geographique", *Studia Albanica,* **2:**161-82.

35. Geco, P., 1973. "Rendesia e qyteteve te medha ne popullsine qytetare te R.P. te Shqiperise (The importance of large cities to the population of the SR of Albania)", *Studime Historike,* **1:** 53-71.

37. Gjonca A. and Bobak M. 1997. "Albanian paradox, another example of protective effect of Mediterranean lifestyle?" *The Lancet.* Vol. 350, p.1815-1817.

38. Golemi, B. And Misja, V. 1987. *Zhvillimi i arsimit te larte ne Shqiperi* (Development of high education in Albania), Tirana.

39. Hackett, LW June 1944. "Spleen measurement in Malaria", *J. Nat. Malaria Soc.* Vol. III, No. 2, p. 121-133.

40. Hall, D. 1994. *Albania and the Albanians*, Pinter, London and New York.

41. Hall, D.R.1987. "Albania", ed. Dawson, A. H., *Planning in Eastern Europe,* Croom Helm, London.

42. Haigh, W. E., 1925. *Malaria in Albania.* League of Nations Health Organisation, Geneva, February 1925, C. H. 272

43. Hammond, N. 1992. "The relations of the Illyrian Albania with the Greeks and the Romans", *Perspectives on Albania*, edited by T. Winnifrith, Macmillan, Basingstoke and London.

44. Halstead et al. 1985. *Good Health at Low Cost.* The Rockfeller Foundation. New York. 1995.

45. Harding, A. 1992. "The Prehistoric Background on Illyrian Albania", *Perspectives on Albania*, edited T. Winnifrith, Macmillan, Basingstoke and London.

46. Helsing, E. 1995. "Traditional Diet and disease patterns of the Mediterranean, circa 1960". *Am J Clin Nutr*, 61 (supplement) p. 1329S-37S.

47. Hill, K. 1987. "Estimating census and death registration completeness", *Asian and Pacific Population Forum 1*, 3, p. 8-13, 23.

48. Hoffman, G. W. 1972. *Regional Development Strategy in Southeast Europe: a comparative analysis of Albania, Bulgaria, Greece, Romania, and Yugoslavia,* Praeger, New York.

49. INSTAT 1992. Statistical Yearbook of Albania 1991, Institute of Statistics, Tirana, Albania.

50. INSTAT 1996. Albania in Figures - 1995, Institute of Statistics, Tirana, Albania.

51. INSTAT 1998. Albania in Figures - 1997, Institute of Statistics, Tirana, Albania.

52. INSTAT, UNFPA, 1996. *Projeksionet e Popullsisë së Shqipërisë 1995 - 2210* (Projections of Albanian Population 1995 - 2010), Tirana, Albania.

53. Instituto Cenrale di Statistica (I.C.S.)1958. *Annuario Statistico Nea Communi Italiani*, Rome.

54. Islami, H. 1990. *Kosova dhe Shqiptaret* (Kosova and Albanians), Rilindja, Prishtine.

55. Jones, E. and Grupp, F. W. 1983. "Infant mortality trends in the Soviet Union", *Population and Development Review* 9, No. 2, p. 213-246.

56. Kaser, K. 1995, Familie und Verwandtschaft auf dem Balkan: Analyse einer untergehenden Kultur. Wien, Köln, Weiner, Böhland Verlag.

57. Keefe et al., 1971. *Area Handbook for Albania*, US Government Printing Office, Washington DC.

58. Kellezi, A. 1973. "Raport mbi planin dhe buxhetin e shtetit per vitin 1973" (Report on the state plan and budget for 1973), *Probleme Economike,* Tirana, No. 1.

59. Keys, A. et al. 1986. "The diet and the 15-year death rate in the seven country study". *American Journal of Epidemiology.*Vol. 124, p. 903-915.

60. Keys, A. 1980. *Seven countries study: a multivariate analysis of death and coronary heart disease*. Cambridge, MA, Harvard University press.

61. Konica, F. 1957. *The Rock Garden of South Eastern Europe*, edited by Panarity, Boston.

62. KPSH, 1974. *Zhvillimi ekonomik - shoqeror ne Shqiperi* 1944-1974, (Social and economic development in Albania 1944-1974). Komisioni i Planit te Shtetit (State Planning Commission), Tirana.

63. Kunitz, S. (1996) "What Yugoslavia means: progress, nationalism and health". In the R.M. Douglas, G. Jones and R.M. D'Souza (eds.) *The shaping of fertility and mortality declines: the contemporary demographic transition.* Suplement to the *Health Transition Review*, Vol. 6, p. 243-272.

64. Kushi, L.H., Lenart, E.B., Willett, W.C., 1995a. "Health Implications of Mediterranean Diets in light of contemporary knowledge: 1 plants foods and diary products. *Am J Clin Nutr; 61* (supplement), p. 1407S-15S.

65. Kushi, L.H., Lenart, E.B., Willett, W.C., 1995b. "Health Implications of Mediterranean Diets in light of contemporary knowledge: 2 meats, wine, fats and oils. *Am J Clin Nutr; 61* (supplement), p. 1416S-27S.

66. Kuvendi Popullor, 1976. *The Constitution of the Socialist Republic of Albania*, Article 14, Article 28, Article 41.

67. Logoreci, A. 1977. *The Albanians: Europe's forgotten survivors*. Victor Gollancz; Boulder, CO: Westview Press. London

68. Marmot, M., Shipley, M. and Rose, G. 1984. "Inequalities in death: Specific explanations of a general pattern?", *The LANCET*, 1, p. 1003-6

69. Marmullaku, R. 1975. *Albania and the Albanians*, C.Hurst & Co, London.

70. Martin, L. G. 1980. "A modification for use in destabilized populations of brass's technique for estimating completeness of death registration". *Population Studies*, 34 (2), p. 381-395.

71. Mason, K., Myres, J., Winterbotham, H. S. L., Longland, F., Davidson, C. F., Turrill, W. B.,

White, N., Mann, S. E., 1945. *Albania*, Naval Intelligence Division, London

72. Meksi, E. And Dalla Zuanna, P. 1994. "La mortalite generale en Albanie (1950-1990)", *Population*, 49, no. 3, p. 607-636.

73. Meslé, F. 1991. "La mortalité dans les pays d'Europe de l'Est", *Population*, 46, no. 3, p. 599-651.

74. Misja, V. Vejsiu Y. and Bërxholli, A. 1987. *Popullsia e Shqipërisë* (Albanian Population). Mihal Duri, Tirana, Albania.

75. Misja, V., Vejsiu, Y., 1982, "De l'accroisement demographique en RPS d'Albanie", *Studia Albanica*, **19** (1): p. 3-30.

76. Mitchel, B. R., 1978. *European Historical Statistics*. London & Basingstone, Macmillan Press.

77. Pano, N. 1992. *The Columbia History of Eastern Europe in the Twentieth Century*. Edited by J. Held.

78. P.H. '8 Nentori' (Publishing House), 1982. *Portrait of Albania*, 8 Nentori, Tirana.

79. Pollard, J. H., 1982. "The expectation of life and its relationship to mortality", *Journal of the Institute of Actuaries*, 109, p. 225-240

80._____, 1989. "Mortality changes and their economic consequences, with particular reference to cause of death", *Demographic Change and Economic Development* (ed by Wenig, A. & Zimmerman, K) p. 42-69

81._____, 1990. "Cause of death and expectation of life: Some international comparison", *Measurements and Analysis of Mortality* ed. by Vallin, J. Droza, S. & Palloni, A, p. 269-291.

82. Pollo, S. and Puto, A. 1981. *The History of Albania*, Routledge & Kengan Paul, London, Boston and Heanly.

83. Preston, S. 1976a. *Mortality patterns in national populations: with special reference to recorded causes of death*. New York, Academic Press.

84. Preston, S. 1976b. *Causes and consequences of mortality declines in less developed countries during the twentieth century*, Conference on Population and Economic Change in Less Developing Countries.

85. Preston, S. and Coale, A. 1982. "Age structure, Growth, Attrition and Accession: A new Synthesis", *Population Index*, 48(2), p. 217-259.

86. Preston, S. and Hill, K. 1980. "Estimating the completeness of death registration". *Population Studies* 34(2), p. 349-366.

87. Preston, S., Coale, A., Trussell, J., and Weinstein, M. 1980 "Estimating the completeness of reporting of adult deaths in populations that are approximately stable". *Population Index*, 46(2), p. 179-202.

88. Prifti, P. 1978. *Socialist Albania since 1944*, The MIT Press, Cambridge, Massachusetts, and London UK.

89. Schnytzer, A. 1982. *Stalinist economic strategy in practice: the case of Albania,* Oxford University Press, London.

90. Selenica, T. 1928. *Shqiperia me 1927* (Albania in 1927) Shtypshkronja 'Tirane', Tirana.

91. Shkodra, G. & Ganiu, S. 1984. *The well-being of the Albanian people and some factors and ways for its continues improvement*, 8 Nentori, Tirana, Albania.

92. Sheri, F. and Imami, Sh. 1962. "Një përshkrim i shkurtër i statistikës në vendin tonë". (A short description of the statistics in our country). *Ekonomia Popullore*, No. 2, p. 54-68. Tirana, Albania

93. Shkolnikov, V., France Meslè, and Vallin, J., 1995. "La crise sanitare en Russie", *Population* 50, no. 4-5, p. 907-982.

94. Shoup, P. S. 1981. *THE EAST EUROPEAN AND SOVIET DATA HANDBOOK: Political, Social and Development Indicators: 1945-1975.* Stanford University, Columbia University Press, New York.

95. Sjoberg, O. 1991. *Rural Change and Development in Albania.* Boulder, CO and Oxford: Westview Press.

96. Sjoberg, O., Wyzan, M., 1991. *Economic change in the Balkan states: Albania, Bulgaria, Romania and Yugoslavia,* Pinter, London.

97. Sjoberg, O., 1989. "A note in the regional dimension of post-war demographic development in Albania". *Nordic Journal of Soviet and East European Studies,* **6** (1): 91-121.

98. Skendi, S. 1956. *Albania*, Stevens and Sons, London.

99. Skendi, S. 1957. *Albania*, London, Atlantic Press.

100. Skenderi, K., Vejsiu, Y., 1983. "The development of demographic processes and the socio-economic problems which emerge, in Institute of Marxist-Leninist Studies", *The National Conference on problems of the development of the economy in the 7th five-year plan,* 8 Nentori, Tirana, p. 155-164.

101. Skenderi, K., Vejsiu, Y., 1984. "The demographic processes are inseparable from the socio-economic development", *Albania Today,* **77**:3-35.

102. United Nations, 1983. *Manual X. Indirect Techniques for Demographic Estimation.* 'Brass Growth Balance Method', p. 139-146, New York.

103. United Nations, 1988. *MORTPAK. The United Nations Software Package for Mortality Measurements*. United Nations, New York.

104. United Nations, 1993. *Human Development Report.* Oxford and New York, Oxford University

Press.

105. UNFPA, 1993. *Readings in Population Research Methodology*. Vol. 1, "Smoothing Age Distribution", 5-31...5-37.

106. UNICEF, 1994. *Crises in mortality, health and nutrition*. Florence, Italy: UNICEF International Child Development Center.

107. Van der Pol, H. 1993. "Some aspects of infant mortality in Albania". *Occasional Paper*, INSTAT, Tirana, Albania.

108. Vejsiu, Y. 1981. *Aspekte te zhvillimit industrial dhe te transformimeve demografike ne RPSSH"* (Aspects of the industrial development and of demographic changes in the PSRA), Universiteti i Tiranes, Fakulteti Ekonomik, Tirane.

109. Watson, P. 1995. "Explaining rising mortality among men in Eastern Europe", *Social Science and Medicine*, Vol. 41, 7, p. 923-934.

110. Winnifrith, T. 1992. "Albania and the Ottomoan Empire", *Perspectives on Albania*, ed. by Winnifrith, Macmillan, Basingstoke and London.

111. Wilkes, J. 1992. *The Illyrians*, Oxford: Blackwell.

112. Wikinson, R. 1989. "Class mortality differentials, income distribution and trends in poverty 1921-1981". *Journal of Social Policy*, 18(3), p. 307-335.

113. Wikinson, R. 1992. "Income distribution and life expectancy". *British Medical Journal*, 304, p. 165-168.

114. World Bank, 1996. *World Development Report 1996*. Oxford and New York, Oxford University Press.

115. World Bank, 1997. *World Development Report 1997 - The State in a Changing World*. Oxford University Press, New York.

116. World Health Organisation, 1993. *STOA Report on Nutrition in Europe*. Geneva: WHO Regional Office for Europe.

APPENDIX A

3.304 Smoothing population age distribution. Polynomial method.

This method is based on the application of successive polynomials to the reported population age distribution. The polynomials are applied to cumulated age distributions, because the cumulation eliminates the effects coming from a transfer of people from one age to another, especially for the boundary ages.

Step 1. First, the cumulated populations under ages ending with 3 and 8 are calculated by the formulae:

$$N(x\text{-}) = \sum N(y) \qquad \text{A.1}$$

Where: N(y) - the population of age y,
N(x-)- the population under age x.
$y \in (0, x\text{-}1)$

Based on this formulae the cumulated populations under age 3 and 8 are calculated.

Step 2. After the cumulated populations under age 3 and 8 are calculated, two polynomials are applied to these two cumulated populations:

$$N((a+12)\text{-}) = -0.048N(a\text{-}) + 0.864N((a+10)\text{-}) + 0.216N((a+20)\text{-}) - 0.032N((a+30)\text{-}) \qquad \text{A.2}$$

and

$$N((a+17)\text{-}) = -0.0455N(a\text{-}) + 0.3315N((a+10)\text{-}) + 0.7735N((a+20)\text{-}) - 0.0595N((a+30)\text{-}) \qquad \text{A.3}$$

if a = 3 the population under age 15 will be given by equation A.2, and the population under 20 will be given by equation A.3

If a = 8 the population under age 20 will be given by equation A.2, and the population under age 25 will be given by equation A.3

The process continues by increasing a by 10.

Step 3. The equations A.2 and A.3 cannot give the population of young ages, thus two more polynomials are applied to estimate the population under the age of 10 and under age of 15.

The calculation of the population under age 10 based on the cumulated populations under ages, 3, 13, 23, and 33, and population under age 15 based on the cumulated populations under ages 8, 18, 28, and

38, is based on the following formulae:

$$N((a+7)-) = 0.1495N(a-) + 1.0465N((a+10)-) - 0.2415N((a+20)-) + 0.0455N((a+30)-) \quad \text{A.4}$$

While the calculation of the population under age 10 from the cumulated populations under ages 8, 18, 28 and 38 is obtained from this formulae:

$$N(10-) = 0.672N(8-) + 0.504N(18-) - 0.224N(28-) + 0.048N(38-) \quad \text{A.5}$$

Step 4. The formulas A.2, A.3, A.4, and A.5 estimate the adjusted cumulated populations under ages ending with 0 and 5, started from age 10 to age 70. By applying those formulas to two cumulated populations, one to ages ending with 3 and one to ages ending with 8, two series of populations under ages ending with 0 and 5 are obtained. Once the two estimates are available, the best estimate from both of them can be obtained by averaging the two values corresponding to the same age. The following formulae is applied:

$$N^*(x-) = [N_3(x-) + N_8(x-)]/2 \quad \text{A.6}$$

Where:

$$x \in (10, 15, 20, \ldots, 60, 65, 70)$$

$N^*(x-)$ - is the population under ages ending with 0 and 5.

$N_3(x-)$ - is the population under ages ending with 0 and 5 obtained by the cumulated populations ending with 3.

$N_8(x-)$ - is the population under ages ending with 0 and 5 obtained by the cumulated populations ending with 8.

Step 5. The N8(x-) values give only the cumulated populations under ages ending with 0 and 5. The final stage is to calculate the population at each age group. This can be obtained by substraction from N*((x+5)-) the value of N*(x-); e.g.

$$_5N_{20}^* = N^*(25-) - N^*(20-) \text{ and so on....} \quad \text{A.7}$$

Results from the calculations on the Albanian population at censuses of 1950, 1960 and 1969 are given below:

Table A1. 1950 - Male population.

Age (a)	Pop. under age a	Age (x)	Adjusted pop. under age (x) based on ages ending		Average population under age (x)	Adjusted pop. in age groups (x+5)	Age-groups (x+5)
			with three	with eight			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-	-	0	-	-	-	90640	0-4
3	60603	5	-	-	90640	83279	5-9
8	138864	10	173472	174367	173919	75470	10-14
13	218798	15	247645	251133	249389	64287	15-19
18	290031	20	313931	313421	313676	52892	20-24
23	348992	25	368589	364547	366568	43267	25-29
28	391244	30	411134	408536	409835	38355	30-34
33	433427	35	448487	447894	448190	34501	35-39
38	469026	40	483166	482217	482691	29830	40-44
43	501814	45	513068	511974	512521	25156	45-49
48	517715	50	538071	537284	537677	21059	50-54
53	551085	55	558939	558533	558736	17713	55-59
58	569646	60	576250	576647	576449	15166	60-64
63	585282	65	591201	592027	591614	12539	65-69
68	599758	70	604128	604178	604153	8922	70-74
73	610386	75		613075	613075	5615	75-79
78	617010					6628	80 +
83	621055						
88	623244						

Table A2. 1950 - Female population

Age (a)	Pop. under age a	Age (x)	Adjusted pop. under age (x) based on ages ending		Average population under age (x)	Adjusted pop. in age groups (x+5)	Age-groups (x+5)
			with three	with eight			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-	-	0	-	-	-	83379	0-4
3	56641	5	-	-	83379	73276	5-9
8	125267	10	158730	154580	156656	64240	10-14
13	197273	15	221377	220411	220894	55733	15-19
18	255267	20	276491	276764	276628	48431	20-24
23	306319	25	325019	325097	325058	42322	25-29
28	350852	30	367818	366943	367380	37285	30-34
33	391024	35	405660	403670	404665	33245	35-39
38	423677	40	439172	436648	437910	29704	40-44
43	457283	45	468569	466658	467613	25973	45-49
48	482972	50	494213	492960	493586	22473	50-54
53	507958	55	516489	515629	516059	19699	55-59
58	527828	60	535771	535745	535758	17363	60-64
63	546058	65	552731	553511	553121	14395	65-69
68	562582	70	567399	567634	567516	10266	70-74
73	574563	75		577782	577782	6992	75-79
78	582287					9073	80 +
83	587086						
88	589862						

Table A3. 1960 - Male population.

Age (a)	Pop. under age a	Age (x)	Adjusted pop. under age (x) based on ages ending		Average population under age (x)	Adjusted pop. in age groups (x+5)	Age-groups (x+5)
			with three	with eight			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-	-	0	-	-	-	143057	0-4
3	93992	5	-	-	143057	114868	5-9
8	220232	10	259793	256058	257925	90574	10-14
13	317931	15	353186	343811	348499	80544	15-19
18	394306	20	431397	426688	429043	72497	20-24
23	473121	25	501255	501824	501539	63115	25-29
28	541997	30	565700	564809	565255	51322	30-34
33	599661	35	618612	614541	616576	41747	35-39
38	640387	40	659562	657084	658323	36720	40-44
43	680873	45	695290	694795	695042	32580	45-49
48	714786	50	728140	727105	727622	27321	50-54
53	745447	55	755514	754373	754944	22010	55-59
58	768397	60	777181	776727	776954	17624	60-64
63	788044	65	794639	794516	794578	13969	65-69
68	803291	70	808559	805535	808547	10683	70-74
73	815248	75		819230	819230	7417	75-79
78	824039					7750	80 +
83	829484						
88	831815						

Table A4. 1960 - Female population

Age (a)	Pop. under age a	Age (x)	Adjusted pop. under age (x) based on ages ending		Average population under age (x)	Adjusted pop. in age groups (x+5)	Age-groups (x+5)
			with three	with eight			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-	-	0	-	-	-	134025	0-4
3	88154	5	-	-	134025	105692	5-9
8	204684	10	241610	237826	239718	81756	10-14
13	294479	15	326217	316730	321474	70954	15-19
18	361072	20	395594	389261	392428	62750	20-24
23	431967	25	455852	454503	455178	55600	25-29
28	489769	30	510609	510947	510778	47631	30-34
33	540190	35	558464	558355	558409	41080	35-39
38	583452	40	599966	599012	599489	35855	40-44
43	622297	45	636404	634284	635344	31797	45-49
48	653363	50	668514	665767	667141	28177	50-54
53	685702	55	696343	694291	695317	24261	55-59
58	709625	60	720154	719003	719578	20399	60-64
63	732600	65	740203	739752	739978	16713	65-69
68	750368	70	756676	756705	756690	13201	70-74
73	764842	75		769892	769892	9839	75-79
78	775978					11676	80 +
83	782976						
88	786330						

Table A5. 1969 - Male population.

Age (a)	Pop. under age a	Age (x)	Adjusted pop. under age (x) based on ages ending		Average population under age (x)	Adjusted pop. in age groups (x+5)	Age-groups (x+5)
			with three	with eight			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-	-	0	-	-	-	171377	0-4
3	100160	5	-	-	171377	148557	5-9
8	255933	10	322373	317494	319934	129523	10-14
13	401377	15	449356	449558	449457	105877	15-19
18	515927	20	554979	555689	555334	87989	20-24
23	609970	25	644177	642469	643323	76370	25-29
28	687987	30	720938	718446	719692	68492	30-34
33	761879	35	788408	787961	788184	59065	35-39
38	824771	40	848221	846278	847249	47756	40-44
43	879288	45	896745	893266	895006	38457	45-49
48	917518	50	934110	932815	933462	32843	50-54
53	953237	55	966021	966590	966305	28069	55-59
58	983903	60	994523	994225	994374	22268	60-64
63	1009036	65	1017171	1016113	1016642	16573	65-69
68	1026717	70	1033718	1032710	1033214	11399	70-74
73	1041300	75		1044612	1044612	7206	75-79
78	1049912					8649	80 +
83	1056311						
88	1060228						

Table A6. 1969 - Female population

Age (a)	Pop. under age a	Age (x)	Adjusted pop. under age (x) based on ages ending		Average population under age (x)	Adjusted pop. in age groups (x+5)	Age-groups (x+5)
			with three	with eight			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-	-	0	-	-	-	161776	0-4
3	94779	5	-	-	161776	139290	5-9
8	240919	10	303201	298929	301065	120466	10-14
13	376709	15	421119	421943	421531	96931	15-19
18	482808	20	518037	518888	518463	79031	20-24
23	567868	25	598502	596485	597493	67254	25-29
28	636551	30	666384	663111	664747	59464	30-34
33	702105	35	724826	723597	724212	51650	35-39
38	755914	40	776148	775576	775862	43910	40-44
43	803397	45	819952	819590	819771	37526	45-49
48	842880	50	857171	857423	857297	32894	50-54
53	877141	55	890211	890170	890191	29048	55-59
58	907561	60	920020	918458	919239	24729	60-64
63	935771	65	945136	942800	943968	20229	65-69
68	955447	70	965234	963159	964197	15337	70-74
73	975073	75		979534	979534	10124	75-79
78	987291					12077	80 +
83	996354						
88	1001218						

Table B1. Life Table of Albania APPENDIX B

1950	Male					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.156659	0.142181	100000	92890.5	5189763	51.89763
1 - 4	0.023972	0.090671	85781	327568	5096873	59.41727
5 - 9	0.003905	0.019336	78003	386242.5	4769305	61.14258
10 - 14	0.002184	0.010862	76494	380392.5	4383062	57.29943
15 - 19	0.002651	0.013169	75663	375822.5	4002670	52.90128
20 - 24	0.004643	0.022949	74666	369045	3626847	48.57428
25 - 29	0.005287	0.026091	72952	360000	3257802	44.65679
30 - 34	0.006227	0.030659	71048	349792.5	2897802	40.78654
35 - 39	0.00546	0.026934	68869	339707.5	2548010	36.99792
40 - 44	0.007669	0.037622	67014	328765	2208302	32.95285
45 - 49	0.008559	0.041897	64492	315702.5	1879537	29.14373
50 - 54	0.013845	0.066907	61789	298607.5	1563835	25.30927
55 - 59	0.014561	0.070246	57654	278145	1265227	21.94518
60 - 64	0.024178	0.114	53604	252742.5	987082.2	18.41434
65 - 69	0.031032	0.14399	47493	220367.5	734339.7	15.46206
70 - 74	0.05128	0.227263	40654	180170	513972.2	12.6426
75 - 79	0.0687	0.29315	31414	134045	333802.2	10.62591
80 - above	0.111155	1	22204	199757.2	199757.2	8.996452

Table B2. Life Table of Albania

1950	Female					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.158899	0.144024	100000	92798.5	5128314	51.28314
1 - 4	0.032813	0.121669	85597	321558	5035515	58.82818
5 - 9	0.005325	0.026277	75182	370970	4713957	62.70061
10 - 14	0.002802	0.013913	73206	363482.5	4342987	59.32557
15 - 19	0.00323	0.016019	72187	358042.5	3979505	55.12772
20 - 24	0.004835	0.023884	71030	350907.5	3621462	50.98497
25 - 29	0.005086	0.025111	69333	342310	3270555	47.17169
30 - 34	0.005739	0.028291	67591	333172.5	2928245	43.323
35 - 39	0.006588	0.032408	65678	323067.5	2595072	39.51205
40 - 44	0.005763	0.028408	63549	313230	2272005	35.75202
45 - 49	0.005961	0.029369	61743	304180	1958775	31.72465
50 - 54	0.009242	0.045168	59929	292877.5	1654595	27.60925
55 - 59	0.010544	0.051365	57222	278760	1361717	23.7971
60 - 64	0.014355	0.069287	54282	262005	1082957	19.95058
65 - 69	0.013816	0.066772	50520	244165	820952.5	16.25005
70 - 74	0.045001	0.20225	47146	211890	576787.5	12.23407
75 - 79	0.060491	0.262725	37610	163345	364897.5	9.70214
80 - above	0.137572	1	27728	201552.5	201552.5	7.268916

Table B3. Life Table of Albania

1960	Male					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.099329	0.092017	100000	95399	6171519	61.71519
1 - 4	0.012772	0.049568	90798	354190	6076120	66.91909
5 - 9	0.00169	0.008413	86297	429670	5721930	66.30508
10 - 14	0.000994	0.004956	85571	426792.5	5292260	61.84642
15 - 19	0.001212	0.00604	85146	424442.5	4865467	57.14264
20 - 24	0.001391	0.006931	84631	421687.5	4441025	52.47515
25 - 29	0.001668	0.008304	84044	418475	4019337	47.8242
30 - 34	0.002239	0.011135	83346	414407.5	3600862	43.20378
35 - 39	0.00239	0.011877	82417	409637.5	3186455	38.66259
40 - 44	0.003455	0.017126	81438	403702.5	2776817	34.09732
45 - 49	0.004992	0.024653	80043	395280	2373115	29.648
50 - 54	0.01012	0.049352	78069	380712.5	1977835	25.33444
55 - 59	0.014434	0.069658	74216	358155	1597122	21.51992
60 - 64	0.023933	0.112908	69046	325740	1238967	17.94408
65 - 69	0.026933	0.126168	61250	286930	913227.3	14.90983
70 - 74	0.054301	0.239052	53522	235622.5	626297.3	11.70168
75 - 79	0.06637	0.284625	40727	174655	390674.8	9.592525
80 - above	0.134872	1	29135	216019.8	216019.8	7.414443

Table B4. Life Table of Albania

1960	Female					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.110163	0.101241	100000	94937.5	6217632	62.17632
1 - 4	0.017884	0.068593	89875	347170	6122694	68.12455
5 - 9	0.002326	0.011562	83710	416130	5775524	68.99444
10 - 14	0.000857	0.004276	82742	412825	5359394	64.77236
15 - 19	0.000837	0.004176	82388	411077.5	4946569	60.03992
20 - 24	0.001817	0.009043	82043	408360	4535492	55.28189
25 - 29	0.001452	0.007236	81301	405032.5	4127132	50.7636
30 - 34	0.002443	0.012143	80712	401107.5	3722099	46.11581
35 - 39	0.002342	0.01164	79731	396332.5	3320992	41.65245
40 - 44	0.003743	0.01854	78802	390357.5	2924659	37.11402
45 - 49	0.003063	0.015197	77341	383765	2534302	32.76789
50 - 54	0.005353	0.02641	76165	375795	2150537	28.23524
55 - 59	0.008125	0.039817	74153	363382.5	1774742	23.93351
60 - 64	0.016126	0.077505	71200	342202.5	1411359	19.82246
65 - 69	0.022098	0.104707	65681	311210	1069157	16.27802
70 - 74	0.042911	0.193767	58803	265527.5	757946.8	12.88959
75 - 79	0.057573	0.251647	47408	207212.5	492419.3	10.38684
80 - above	0.12439	1	35477	285206.8	285206.8	8.039202

Table B5. Life Table of Albania

1969	Male					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.095984	0.088352	100000	95582	6455310	64.5531
1 - 4	0.005102	0.020161	91164	360980	6359728	69.76139
5 - 9	0.001193	0.005945	89326	445300	5998748	67.15567
10 - 14	0.000953	0.004752	88794	442915	5553448	62.54305
15 - 19	0.000896	0.004472	88372	440870	5110533	57.82977
20 - 24	0.001151	0.005736	87976	438617.5	4669663	53.07882
25 - 29	0.000953	0.004753	87471	436315	4231045	48.37083
30 - 34	0.001694	0.008432	87055	433437.5	3794730	43.59003
35 - 39	0.002375	0.011803	86320	429052.5	3361293	38.9399
40 - 44	0.00318	0.015774	85301	423140	2932240	34.37521
45 - 49	0.004525	0.02237	83955	415077.5	2509100	29.88625
50 - 54	0.007899	0.038729	82076	402432.5	2094023	25.51321
55 - 59	0.015141	0.072942	78897	380097.5	1691590	21.44049
60 - 64	0.020221	0.096242	73142	348110	1311493	17.93077
65 - 69	0.035888	0.164664	66102	303297.5	963382.5	14.57418
70 - 74	0.052454	0.231866	55217	244077.5	660085	11.95438
75 - 79	0.075367	0.317088	42414	178447.5	416007.5	9.80826
80 - above	0.121927	1	28965	237560	237560	8.201624

Table B6. Life Table of Albania

1969	Female					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.097661	0.08977	100000	95511	6848233	68.48233
1 - 4	0.006203	0.024447	91022	359636	6752722	74.1878
5 - 9	0.000942	0.004698	88796	442935	6393086	71.99745
10 - 14	0.000465	0.002324	88378	441375	5950151	67.32615
15 - 19	0.00059	0.002945	88172	440210	5508776	62.47761
20 - 24	0.000865	0.004317	87912	438610	5068566	57.65499
25 - 29	0.001084	0.005403	87532	436477.5	4629956	52.89444
30 - 34	0.001244	0.006202	87059	433945	4193478	48.16823
35 - 39	0.001715	0.008537	86519	430747.5	3759533	43.45327
40 - 44	0.0024	0.011929	85780	426340	3328786	38.80608
45 - 49	0.002599	0.012912	84756	421042.5	2902446	34.24472
50 - 54	0.003442	0.017065	83661	414735	2481403	29.66022
55 - 59	0.006986	0.03433	82233	404105	2066668	25.13186
60 - 64	0.01274	0.061732	79409	384787.5	1662563	20.93671
65 - 69	0.020229	0.096277	74506	354595	1277776	17.14997
70 - 74	0.036843	0.168677	67332	308265	923180.8	13.71088
75 - 79	0.056035	0.245748	55974	245480	614915.8	10.98574
80 - above	0.114277	1	42218	369435.8	369435.8	8.750669

Table B7. Life Table of Albania

1979	Male					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.078381	0.073216	100000	96339	6562593	65.62593
1 - 4	0.004227	0.016738	92678	367608	6466254	69.77119
5 - 9	0.000913	0.004556	91126	454590	6098646	66.92542
10 - 14	0.000643	0.003208	90710	452822.5	5644056	62.22088
15 - 19	0.000982	0.004898	90419	450987.5	5191233	57.41308
20 - 24	0.001	0.004986	89976	448757.5	4740246	52.68345
25 - 29	0.00116	0.005781	89527	446340	4291488	47.93513
30 - 34	0.001221	0.006088	89009	443690	3845148	43.19955
35 - 39	0.001573	0.007834	88467	440600	3401458	38.4489
40 - 44	0.002585	0.012841	87773	436045	2960858	33.73313
45 - 49	0.004107	0.020325	86645	428820	2524813	29.13975
50 - 54	0.00768	0.037677	84883	416417.5	2095993	24.69274
55 - 59	0.012012	0.058307	81684	396512.5	1679576	20.56187
60 - 64	0.023603	0.111439	76921	363175	1283063	16.68028
65 - 69	0.036538	0.167398	68349	313140	919888.4	13.4587
70 - 74	0.057653	0.251952	56907	248690	606748.4	10.66211
75 - 79	0.081845	0.339715	42569	176690	358058.4	8.411249
80 - above	0.154972	1	28107	181368.4	181368.4	6.452786

Table B8. Life Table of Albania

1979	Female					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.080236	0.074832	100000	96258	7058970	70.5897
1 - 4	0.004542	0.017973	92516	366738	6962712	75.25954
5 - 9	0.000639	0.003192	90853	453537.5	6595974	72.60051
10 - 14	0.000465	0.002325	90562	452282.5	6142436	67.82576
15 - 19	0.000544	0.002716	90351	451140	5690154	62.97832
20 - 24	0.000619	0.003092	90105	449827.5	5239014	58.14343
25 - 29	0.000606	0.003028	89826	448450	4789186	53.31626
30 - 34	0.000987	0.004921	89554	446667.5	4340736	48.4706
35 - 39	0.001274	0.006348	89113	444150	3894069	43.6981
40 - 44	0.001399	0.006968	88547	441190	3449919	38.96144
45 - 49	0.002168	0.01078	87929	437275	3008729	34.21771
50 - 54	0.003554	0.017616	86981	431072.5	2571454	29.5634
55 - 59	0.004738	0.02341	85448	422237.5	2140381	25.04893
60 - 64	0.010744	0.052315	83447	406320	1718144	20.58964
65 - 69	0.018988	0.090639	79081	377485	1311824	16.58836
70 - 74	0.038808	0.176877	71913	327765	934338.9	12.99263
75 - 79	0.058941	0.256857	59193	257952.5	606573.9	10.24739
80 - above	0.126177	1	43988	348621.4	348621.4	7.925374

Table B9. Life Table of Albania

1989	Male					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.04909	0.047013	100000	97649	6792152	67.92152
1 - 4	0.003877	0.015365	95298	378262	6694503	70.2481
5 - 9	0.000923	0.004605	93833	468082.5	6316241	67.31364
10 - 14	0.00056	0.002795	93400	466345	5848159	62.61412
15 - 19	0.000852	0.004253	93138	464697.5	5381814	57.78322
20 - 24	0.00116	0.005785	92741	462362.5	4917116	53.01987
25 - 29	0.001121	0.005587	92204	459730	4454754	48.3141
30 - 34	0.001143	0.005701	91688	457132.5	3995024	43.57193
35 - 39	0.001419	0.00707	91165	454212.5	3537891	38.80756
40 - 44	0.001935	0.00963	90520	450420	3083679	34.06627
45 - 49	0.003053	0.015149	89648	444842.5	2633259	29.37331
50 - 54	0.006371	0.031354	88289	434522.5	2188416	24.78696
55 - 59	0.010994	0.053502	85520	416160	1753894	20.50858
60 - 64	0.019898	0.094777	80944	385540	1337734	16.52666
65 - 69	0.031467	0.145859	73272	339640	952193.6	12.99533
70 - 74	0.05865	0.255752	62584	272905	612553.6	9.787702
75 - 79	0.09668	0.389307	46578	187555	339648.6	7.292039
80 - above	0.187016	1	28444	152093.6	152093.6	5.347123

Table B10. Life Table of Albania

1989	Female					
Age-Groups	Mx	Qx	lx	Lx	Tx	ex
0	0.045154	0.04339	100000	97830	7383334	73.83334
1 - 4	0.00392	0.015535	95660	379666	7285504	76.1604
5 - 9	0.000718	0.003584	94173	470020	6905838	73.3314
10 - 14	0.000396	0.001978	93835	468710	6435818	68.58654
15 - 19	0.000372	0.001857	93649	467810	5967108	63.7178
20 - 24	0.000614	0.003065	93475	466657.5	5499298	58.83175
25 - 29	0.000743	0.003707	93188	465075	5032641	54.00524
30 - 34	0.000794	0.003961	92842	463290	4567566	49.19719
35 - 39	0.001004	0.005005	92474	461212.5	4104276	44.38302
40 - 44	0.001454	0.007244	92011	458387.5	3643063	39.59378
45 - 49	0.001727	0.008596	91344	454755	3184676	34.86464
50 - 54	0.003004	0.014909	90558	449412.5	2729921	30.14555
55 - 59	0.004519	0.022342	89207	441050	2280508	25.56423
60 - 64	0.008728	0.042709	87213	426752.5	1839458	21.09156
65 - 69	0.015983	0.076844	83488	401400	1412706	16.92106
70 - 74	0.029585	0.137738	77072	358820	1011306	13.12157
75 - 79	0.064712	0.278502	66456	286007.5	652485.7	9.818311
80 - above	0.130832	1	47947	366478.2	366478.2	7.643402

Table B11. Contribution of different age groups to changes of e(0), male-female

1950-1960									Contribution
Age-groups	ex (60)	lx (60)	ex (50)	lx (50)	nQx (60)	nQx (50)	Q50-Q60	Wx	to e(0)
0	61.9943	1	51.59043	1	0.101523	0.154387	0.052864	56.31589	2.977079
1 - 4	67.56532	0.90346	59.11961	0.85694	0.060372	0.111298	0.050926	55.56537	2.829736
5 - 9	67.64557	0.85053	61.84421	0.76668	0.009949	0.02281	0.012861	52.22882	0.671711
10 - 14	63.29694	0.84211	58.2134	0.74939	0.00469	0.012353	0.007663	48.21502	0.369468
15 - 19	58.58273	0.83817	53.90588	0.74019	0.005251	0.01463	0.009378	44.25362	0.415029
20 - 24	53.87802	0.83378	49.66346	0.72944	0.007947	0.023792	0.015845	40.32707	0.638972
25 - 29	49.28796	0.82718	45.79903	0.71229	0.007913	0.026085	0.018172	36.44287	0.662232
30 - 34	44.65968	0.82066	41.94336	0.69395	0.011718	0.030135	0.018417	32.6165	0.600702
35 - 39	40.15659	0.8111	38.15006	0.67335	0.011869	0.030045	0.018176	28.86004	0.524566
40 - 44	35.6062	0.80153	34.23742	0.65342	0.018002	0.033995	0.015994	25.18206	0.40275
45 - 49	31.20757	0.78723	30.3349	0.63158	0.020469	0.036669	0.0162	21.59581	0.349855
50 - 54	26.80124	0.77128	26.37453	0.60884	0.039107	0.058125	0.019018	18.10901	0.344405
55 - 59	22.77041	0.7417	22.80336	0.57446	0.056366	0.062862	0.006496	14.75211	0.095833
60 - 64	18.94578	0.70105	19.12063	0.53946	0.099569	0.114473	0.014904	11.59794	0.172857
65 - 69	15.66755	0.63461	16.13642	0.48111	0.121972	0.133867	0.011895	8.683665	0.103296
70 - 74	12.37568	0.56174	13.08971	0.42083	0.241836	0.241532	-0.0003	6.097397	-0.00185
75 - 79	10.07751	0.44107	10.98279	0.33053	0.308861	0.323774	0.014912	3.947493	0.058866
80 - above	7.819609	0.32387	9.226052	0.23911	0.5146	0.47291	-0.04169	2.300175	-0.09589

Note: W(x) values are calculated as harmonic means

Table B12. Contribution of different age groups to changes of e(0), male-female

1960-1969									Contribution
Age-groups	ex (69)	lx (69)	ex (60)	lx (60)	nQx (69)	nQx (60)	Q60-Q69	Wx	to e(0)
0	66.46104	1	61.9943	1	0.093333	0.101523	0.00819	64.15001	0.525408
1 - 4	71.91384	0.91089	67.56532	0.90346	0.022471	0.060372	0.037902	63.21152	2.395814
5 - 9	69.50263	0.89065	67.64557	0.85053	0.005393	0.009949	0.004556	59.67591	0.271909
10 - 14	64.86493	0.88586	63.29694	0.84211	0.003642	0.00469	0.001048	55.33834	0.058005
15 - 19	60.09244	0.88264	58.58273	0.83817	0.003791	0.005251	0.00146	51.02878	0.074506
20 - 24	55.31121	0.8793	53.87802	0.83378	0.005119	0.007947	0.002828	46.7377	0.132167
25 - 29	50.58226	0.87481	49.28796	0.82718	0.005077	0.007913	0.002837	42.46952	0.120469
30 - 34	45.82699	0.87038	44.65968	0.82066	0.007484	0.011718	0.004233	38.22921	0.161828
35 - 39	41.15248	0.86389	40.15659	0.8111	0.010426	0.011869	0.001443	34.02218	0.049097
40 - 44	36.55758	0.85493	35.6062	0.80153	0.014124	0.018002	0.003878	29.86055	0.115803
45 - 49	32.04201	0.84294	31.20757	0.78723	0.018052	0.020469	0.002417	25.75392	0.062254
50 - 54	27.58014	0.82786	26.80124	0.77128	0.028723	0.039107	0.010384	21.7202	0.225544
55 - 59	23.31095	0.80442	22.77041	0.7417	0.055633	0.056366	0.000733	17.78853	0.013038
60 - 64	19.50153	0.76089	18.94578	0.70105	0.081995	0.099569	0.017573	14.03374	0.246621
65 - 69	15.95432	0.70099	15.66755	0.63461	0.137528	0.121972	-0.01556	10.53634	-0.1639
70 - 74	12.93793	0.61092	12.37568	0.56174	0.218766	0.241836	0.023069	7.411261	0.170972
75 - 79	10.49043	0.49088	10.07751	0.44107	0.323265	0.308861	-0.0144	4.781589	-0.06887
80 - above	8.539836	0.35529	7.819609	0.32387	0.619196	0.5146	-0.1046	2.771999	-0.28994

Note: W(x) values are calculated as harmonic means

Table B13. Contribution of different age groups to changes of e(0), male-female

1969-1979									Contribution
Age-groups	ex (79)	lx (79)	ex (69)	lx (69)	nQx (79)	nQx (69)	Q69-Q79	Wx	to e(0)
0	67.96537	1	66.46104	1	0.076946	0.093333	0.016387	67.20479	1.101305
1 - 4	72.36149	0.92594	71.91384	0.91089	0.017497	0.022471	0.004974	66.24891	0.329515
5 - 9	69.60342	0.90988	69.50263	0.89065	0.00392	0.005393	0.001472	62.60946	0.092182
10 - 14	64.867	0.90632	64.86493	0.88586	0.002795	0.003642	0.000846	58.11818	0.049174
15 - 19	60.04159	0.90379	60.09244	0.88264	0.003891	0.003791	-1.0E-04	53.64496	-0.00536
20 - 24	55.26593	0.90028	55.31121	0.8793	0.004107	0.005119	0.001012	49.18813	0.049792
25 - 29	50.48309	0.89659	50.58226	0.87481	0.004516	0.005077	0.000561	44.74944	0.02509
30 - 34	45.70028	0.89255	45.82699	0.87038	0.005573	0.007484	0.001912	40.33188	0.077108
35 - 39	40.94169	0.88759	41.15248	0.86389	0.00718	0.010426	0.003246	35.93851	0.116654
40 - 44	36.21869	0.88124	36.55758	0.85493	0.010288	0.014124	0.003835	31.57783	0.121117
45 - 49	31.56739	0.87222	32.04201	0.84294	0.016111	0.018052	0.00194	27.26214	0.0529
50 - 54	27.0395	0.85828	27.58014	0.82786	0.02805	0.028723	0.000673	23.01023	0.015482
55 - 59	22.73757	0.83454	23.31095	0.80442	0.042281	0.055633	0.013351	18.85431	0.251729
60 - 64	18.61159	0.79999	19.50153	0.76089	0.086335	0.081995	-0.00434	14.84638	-0.06444
65 - 69	15.0644	0.73382	15.95432	0.70099	0.136249	0.137528	0.001279	11.10422	0.014199
70 - 74	11.89839	0.64035	12.93793	0.61092	0.23708	0.218766	-0.01831	7.743711	-0.14182
75 - 79	9.412865	0.50519	10.49043	0.49088	0.346891	0.323265	-0.02363	4.936881	-0.11664
80 - above	7.279369	0.35711	8.539836	0.35529	0.726777	0.619196	-0.10758	2.798925	-0.30111

Note: W(x) values are calculated as harmonic means

Table B14. Contribution of different age groups to changes of e(0), male-female

1979-1989									Contribution
Age-groups	ex (89)	lx (89)	ex (79)	lx (79)	nQx (89)	nQx (79)	Q79-Q89	Wx	to e(0)
0	70.6983	1	67.96537	1	0.046484	0.076946	0.030462	69.3049	2.111167
1 - 4	73.03841	0.95458	72.36149	0.92594	0.015572	0.017497	0.001924	68.34436	0.131513
5 - 9	70.15331	0.93983	69.60342	0.90988	0.004137	0.00392	-0.00022	64.61353	-0.014
10 - 14	65.43377	0.93595	64.867	0.90632	0.002418	0.002795	0.000378	59.99984	0.02267
15 - 19	60.5861	0.93369	60.04159	0.90379	0.003122	0.003891	0.00077	55.40101	0.042641
20 - 24	55.7677	0.93078	55.26593	0.90028	0.00449	0.004107	-0.00038	50.81599	-0.01946
25 - 29	51.00742	0.92661	50.48309	0.89659	0.004695	0.004516	-0.00018	46.24953	-0.00826
30 - 34	46.23569	0.92227	45.70028	0.89255	0.00488	0.005573	0.000692	41.70319	0.028871
35 - 39	41.44965	0.91778	40.94169	0.88759	0.006109	0.00718	0.001071	37.17873	0.0398
40 - 44	36.68834	0.91219	36.21869	0.88124	0.008543	0.010288	0.001745	32.68096	0.057026
45 - 49	31.98167	0.90443	31.56739	0.87222	0.012114	0.016111	0.003997	28.21897	0.112805
50 - 54	27.34098	0.89354	27.0395	0.85828	0.024046	0.02805	0.004003	23.80848	0.095317
55 - 59	22.94555	0.87231	22.73757	0.83454	0.039447	0.042281	0.002835	19.48557	0.055235
60 - 64	18.76818	0.83857	18.61159	0.79999	0.070624	0.086335	0.015712	15.305	0.240469
65 - 69	14.95865	0.78139	15.0644	0.73382	0.120694	0.136249	0.015555	11.3602	0.176707
70 - 74	11.55683	0.69255	11.89839	0.64035	0.214714	0.23708	0.022366	7.797776	0.174407
75 - 79	8.726014	0.55873	9.412865	0.50519	0.402855	0.346891	-0.05596	5.533711	-0.30969
80 - above	6.814681	0.37346	7.279369	0.35711	0.775549	0.726777	-0.04877	2.903803	-0.14162

Note: W(x) values are calculated as harmonic means

APPENDIX C

This appendix gives the cause specific (multiple decrement) life tables for Albania in 1957, 1968, 1978, and 1987. The values of the net probability of dying from different causes are shown for each of these years for each sex.

Before the values of net probability of dying are given, it is important to show the way they are calculated in this application.

Step 1. Calculation of the overall probability of dying for all causes and each age group.

This calculation is simply based on the derivation of probability of dying from central death rates.

$$ {}_nq_x = (n*{}_nm_x)/[1+(1-a_n)*n*{}_nm_x] $$

Step 2. Calculation of the relative importance of each cause for each age group (or *the crude probability of death from cause "j"*). These are dependent rates of decrement.

This calculation is based on the overall probability of dying, calculated at step 1, and the relative proportion of each cause.

$$ {}_nq^j_x = {}_nq_x*({}_nd^j_x/{}_nd_x) $$

for each cause "j",
where: $j \in (\alpha,....,\lambda)$
$ {}_nd^j_x$ are the deaths from cause "j" in age group (x+n)
$ {}_nd_x$ are the deaths from all causes in age group (x+n)

Step 3. Calculation of the net probability of dying for each cause and each age group (the independent rates of decrement)

For numerical purposes, an approximation formula is applied here to calculate the net probability of dying from cause α:

$$ q^\alpha_x \approx {}_nq^\alpha_x *[1+{}_nq^\beta_x/2] $$

where: α is one single cause of death
and β is all the remaining causes.

***Note:* It is very important to mention here that the above formula, used for the calculation of the net probability of dying is an approximation, and as a result when all the q^j_x are summed, there is a very slight difference from the overall probability of dying at that age, especially for age groups where the probability of dying is very high.

Table C1. Net probability of dying for males 1957 ${}_nq^j_x$.

Age-groups	1.Tuberculosis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.001436	0.009440	0.001722	0.030949	0.000082	0	0.027034	0.014190	0.015930	0.100784
1-4	0.002326	0.007510	0.001396	0.024980	0.000085	0	0.015719	0.005533	0.012041	0.069591
5-9	0.000659	0.000934	0.000714	0.003073	0.000055	0	0.000769	0	0.003730	0.009935
10-14	0.000647	0.001221	0.001006	0.000934	0.000072	0	0.000431	0	0.004089	0.008399
15-19	0.000615	0.000615	0.001298	0.000478	0.000137	0	0.000137	0	0.003684	0.006963
20-24	0.002088	0.000373	0.001044	0.000299	0.000299	0	0.000821	0	0.003800	0.008723
25-29	0.002454	0.000189	0.001134	0.001134	0.000000	0	0.000945	0	0.005749	0.011605
30-34	0.002952	0.000899	0.000643	0.001670	0.000000	0	0.000899	0	0.005513	0.012576
35-39	0.003029	0.000264	0.001450	0.001581	0.000527	0	0.000527	0	0.005524	0.012903
40-44	0.007454	0.001273	0.003972	0.003179	0.002226	0	0.001591	0	0.006506	0.026199
45-49	0.005134	0.001029	0.005476	0.004622	0.002741	0	0.002228	0	0.011770	0.033000
50-54	0.007242	0.001135	0.014435	0.006791	0.005662	0	0.006340	0	0.015107	0.056712
55-59	0.014604	0.002099	0.013827	0.009412	0.007588	0	0.007067	0	0.019256	0.073853
60-64	0.005267	0.001466	0.018038	0.009347	0.004975	0.060734	0.004099	0	0.016070	0.119944
65-69	0.006755	0.001781	0.023643	0.011707	0.006755	0.078432	0.004981	0	0.020496	0.154550
70-74	0.010817	0.002464	0.039359	0.020082	0.010817	0.128869	0.009347	0	0.035049	0.256806
75-79	0.014719	0.003520	0.049095	0.025822	0.014719	0.162601	0.011230	0	0.044339	0.326045
80+	0.061272	0.014156	0.214149	0.112426	0.064722	0.637349	0.050580	0	0.188414	1.000000

Table C2. Net probability of dying for females 1957 ${}_nq^j_x$.

Age-groups	1.Tubercul osis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.001118	0.010230	0.001590	0.028185	0.000129	0	0.030570	0.015797	0.018717	0.106333
1-4	0.002244	0.007880	0.001824	0.028308	0.000000	0	0.023518	0.007462	0.014826	0.086055
5-9	0.000593	0.002174	0.000264	0.004212	0.000000	0	0.000593	0.000396	0.003029	0.011261
10-14	0.001535	0.000903	0.000361	0.002167	0.000000	0	0.000181	0	0.001535	0.006684
15-19	0.001011	0.000505	0.001011	0.001179	0.000000	0	0.000169	0	0.003197	0.007071
20-24	0.001346	0.000828	0.001553	0.001553	0.000207	0	0.000518	0	0.004341	0.10345
25-29	0.004248	0.001361	0.001654	0.001182	0.000473	0	0.000827	0	0.006012	0.014396
30-34	0.003942	0.000000	0.002448	0.001361	0.000272	0	0.000000	0	0.005568	0.014952
35-39	0.004063	0.001055	0.003312	0.003011	0.000603	0	0.000907	0	0.006013	0.018960
40-44	0.004588	0.000383	0.004206	0.003443	0.002488	0	0.001723	0	0.006303	0.023133
45-49	0.005811	0.001092	0.003635	0.004542	0.002001	0	0.001092	0	0.006354	0.024527
50-54	0.005288	0.000963	0.006962	0.007680	0.004567	0	0.000722	0	0.007202	0.033382
55-59	0.009284	0.004394	0.014917	0.007228	0.004910	0	0.002846	0	0.012104	0.055683
60-64	0.002099	0.001050	0.015905	0.007591	0.002624	0.039444	0.001575	0	0.012795	0.083084
65-69	0.002374	0.001484	0.019724	0.009759	0.003262	0.073191	0.001484	0	0.016509	0.127787
70-74	0.004405	0.002404	0.032836	0.015543	0.005603	0.118303	0.002404	0	0.026577	0.208076
75-79	0.004995	0.003748	0.041231	0.019247	0.006863	0.177187	0.003748	0	0.032119	0.289138
80+	0.011561	0.007525	0.092807	0.044602	0.016162	0.322852	0.007525	0	0.076920	1.000000

Table C3. Net probability of dying for males 1968 ${}_nq^j_x$.

Age-groups	1.Tuberculosis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.000327	0.004052	0.002224	0.044238	0.000327	0	0.016986	0.016181	0.003921	0.088256
1-4	0.000204	0.001770	0.000852	0.011621	0.000170	0	0.003877	0.001668	0.003130	0.023293
5-9	0.000069	0.000826	0.000620	0.000344	0.000207	0	0.000241	0.000103	0.002649	0.005059
10-14	0.000041	0.000572	0.000490	0.000286	0.000163	0	0.000163	0.000082	0.001960	0.003758
15-19	0.000265	0.000370	0.000635	0.000317	0.000529	0	0.000476	0	0.002325	0.004917
20-24	0.000277	0.000485	0.000901	0.000416	0.000762	0	0.000554	0	0.003045	0.006440
25-29	0.000398	0.000464	0.000796	0.000398	0.000730	0	0.000531	0	0.002982	0.006300
30-34	0.000634	0.000397	0.001268	0.000397	0.001664	0	0.000714	0	0.002377	0.007451
35-39	0.000855	0.000475	0.001804	0.000475	0.002278	0	0.001139	0	0.003509	0.010534
40-44	0.001504	0.000877	0.002880	0.000877	0.003755	0	0.001629	0	0.005627	0.017149
45-49	0.001734	0.000267	0.004262	0.001600	0.007712	0	0.002000	0	0.003864	0.021440
50-54	0.003266	0.000654	0.008307	0.003266	0.014775	0	0.003755	0	0.007171	0.041193
55-59	0.005441	0.001168	0.014127	0.006022	0.026356	0	0.006603	0	0.013165	0.072882
60-64	0.004037	0.001516	0.030902	0.018547	0.024001	0.018500	0.006050	0	0.014813	0.117914
65-69	0.006447	0.002460	0.048224	0.028881	0.037255	0.027980	0.009199	0	0.022861	0.183308
70-74	0.009041	0.003021	0.065585	0.039538	0.051188	0.038702	0.012896	0	0.032829	0.252800
75-79	0.011944	0.003784	0.089582	0.053197	0.068842	0.051985	0.016941	0	0.044079	0.340355
80+	0.022633	0.006500	0.165653	0.100798	0.127917	0.097751	0.031169	0	0.081904	1.000000

Table C4. Net probability of dying for females 1968 ${}_nq^j_x$.

Age-groups	1.Tuberculosis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.000355	0.004962	0.001491	0.047857	0.000391	0	0.018072	0.016009	0.004467	0.093604
1-4	0.000107	0.002638	0.000642	0.015234	0.000428	0	0.005447	0.001284	0.003350	0.029129
5-9	0.000158	0.000512	0.000551	0.000827	0.000394	0	0.000315	0	0.002007	0.004764
10-14	0.000141	0.000281	0.000328	0.000422	0.000187	0	0.000141	0	0.001031	0.002530
15-19	0.000367	0.000184	0.000612	0.000184	0.000306	0	0.000245	0	0.001284	0.003180
20-24	0.000419	0.000251	0.000754	0.000251	0.000419	0	0.000335	0	0.001842	0.004273
25-29	0.000622	0.000389	0.001088	0.000233	0.000544	0	0.000467	0	0.002408	0.005752
30-34	0.000864	0.000480	0.001536	0.000480	0.001248	0	0.000480	0	0.002687	0.007777
35-39	0.001108	0.000444	0.001773	0.000444	0.001441	0	0.000444	0	0.003432	0.009085
40-44	0.001279	0.000512	0.002173	0.000512	0.001917	0	0.000895	0	0.004086	0.011372
45-49	0.000998	0.000428	0.003418	0.001853	0.003418	0	0.000571	0	0.001995	0.012682
50-54	0.001390	0.000521	0.005202	0.002778	0.005375	0	0.001042	0	0.003471	0.019779
55-59	0.002469	0.001059	0.009315	0.005283	0.009489	0	0.001940	0	0.005810	0.035364
60-64	0.001152	0.000461	0.023258	0.009868	0.008954	0.014881	0.002073	0	0.008496	0.069143
65-69	0.001311	0.000525	0.034342	0.014854	0.013300	0.022333	0.003406	0	0.012522	0.102591
70-74	0.002145	0.001073	0.058664	0.025127	0.022674	0.038002	0.005710	0	0.022323	0.175618
75-79	0.003801	0.001427	0.089364	0.038411	0.034717	0.058524	0.008063	0	0.034254	0.268559
80+	0.007504	0.003164	0.167379	0.078229	0.069581	0.117377	0.016928	0	0.068826	1.000000

Table C5. Net probability of dying for males 1978 ${}_nq^j_x$.

Age-groups	1.Tuberculosis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.000308	0.001060	0.002289	0.043313	0.000957	0	0.010957	0.012479	0.004233	0.075595
1-4	0.000136	0.000272	0.000715	0.008108	0.000613	0	0.002313	0.001361	0.002755	0.016274
5-9	0.000000	0.000221	0.000190	0.000569	0.000505	0	0.000126	0.000095	0.001926	0.003632
10-14	0.000000	0.000163	0.000131	0.000490	0.000392	0	0.000098	0.000098	0.001533	0.002904
15-19	0.000038	0.000038	0.000305	0.000153	0.000534	0	0.000114	0	0.002782	0.003965
20-24	0.000042	0.000042	0.000374	0.000166	0.000664	0	0.000166	0	0.003442	0.004895
25-29	0.000000	0.000063	0.000380	0.000190	0.000761	0	0.000190	0	0.003671	0.005256
30-34	0.000266	0.000067	0.000666	0.000333	0.001198	0	0.000399	0	0.002660	0.005589
35-39	0.000330	0.000066	0.001055	0.000462	0.001780	0	0.000660	0	0.004214	0.008567
40-44	0.000439	0.000000	0.001317	0.000527	0.002282	0	0.000878	0	0.005432	0.010875
45-49	0.000717	0.000000	0.003478	0.003171	0.007554	0	0.001229	0	0.004702	0.020851
50-54	0.001074	0.000000	0.005494	0.004825	0.011357	0	0.001879	0	0.007229	0.031859
55-59	0.002265	0.000000	0.010716	0.009593	0.017566	0.001133	0.003961	0	0.014217	0.059450
60-64	0.001520	0.000380	0.029072	0.022203	0.030921	0.003984	0.005120	0	0.023878	0.117078
65-69	0.002439	0.000444	0.042274	0.036056	0.035841	0.008626	0.007965	0	0.040563	0.174207
70-74	0.003487	0.000349	0.070551	0.061628	0.052634	0.017683	0.011817	0	0.060300	0.278449
75-79	0.004996	0.001001	0.101989	0.090390	0.063934	0.029211	0.014438	0	0.077735	0.383754
80+	0.009686	0.001713	0.179994	0.164203	0.135202	0.052855	0.031695	0	0.152882	1.000000

Table C6. Net probability of dying for females 1978 ${}_nq^j_x$.

Age-groups	1.Tuberculosis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.000117	0.000896	0.001598	0.044506	0.000702	0	0.010245	0.014215	0.004320	0.076598
1-4	0.000036	0.000291	0.000509	0.007760	0.000910	0	0.002726	0.001746	0.002436	0.016414
5-9	0.000000	0.000184	0.000184	0.000588	0.000625	0	0.000147	0.000037	0.001029	0.002792
10-14	0.000000	0.000114	0.000153	0.000381	0.000458	0	0.000114	0	0.000687	0.001907
15-19	0.000039	0.000039	0.000276	0.000197	0.000434	0	0.000079	0	0.001302	0.002368
20-24	0.000044	0.000088	0.000309	0.000265	0.000486	0	0.000088	0	0.001456	0.002736
25-29	0.000115	0.000058	0.000461	0.000288	0.000634	0	0.000173	0	0.001958	0.003687
30-34	0.000000	0.000078	0.000780	0.000234	0.001325	0	0.000078	0	0.002107	0.004598
35-39	0.000075	0.000075	0.001121	0.000374	0.001718	0	0.000224	0	0.002837	0.006424
40-44	0.000091	0.000000	0.001274	0.000364	0.001910	0	0.000091	0	0.003000	0.006731
45-49	0.000426	0.000000	0.002128	0.001703	0.003616	0	0.000639	0	0.003722	0.012234
50-54	0.000503	0.000000	0.003517	0.002639	0.005647	0	0.001132	0	0.005647	0.019084
55-59	0.000688	0.000138	0.004805	0.003434	0.006310	0.001100	0.001375	0	0.008223	0.026074
60-64	0.000188	0.000000	0.014194	0.010292	0.008801	0.003567	0.001879	0	0.013081	0.052001
65-69	0.000557	0.000000	0.028402	0.023146	0.009613	0.010900	0.003707	0	0.022055	0.098380
70-74	0.001249	0.000312	0.054014	0.029923	0.016752	0.020442	0.007165	0	0.05073	0.190591
75-79	0.001809	0.000362	0.081586	0.057314	0.028285	0.026868	0.010098	0	0.084289	0.290611
80+	0.003129	0.001044	0.166660	0.123706	0.043899	0.059027	0.022110	0	0.158001	1.000000

Table C7. Net probability of dying for males 1987 ${}_nq^j_x$.

Age-groups	1.Tubercul osis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.000000	0.003431	0.001224	0.024400	0.000711	0	0.009125	0.007558	0.001934	0.048383
1-4	0.000000	0.000506	0.000931	0.007373	0.000559	0	0.001383	0.000426	0.005601	0.016778
5-9	0.000029	0.000058	0.000318	0.000318	0.000376	0	0.000116	0.000145	0.002368	0.003727
10-14	0.000031	0.000061	0.000245	0.000245	0.000276	0	0.000092	0.000092	0.001807	0.002850
15-19	0.000000	0.000064	0.000381	0.000127	0.000381	0	0.000095	0	0.002824	0.003873
20-24	0.000000	0.000129	0.000483	0.000193	0.000547	0	0.000161	0	0.004369	0.005914
25-29	0.000036	0.000108	0.000506	0.000181	0.000470	0	0.000108	0	0.003715	0.005124
30-34	0.000084	0.000127	0.000844	0.000211	0.001140	0	0.000296	0	0.002952	0.005653
35-39	0.000060	0.000180	0.001141	0.000240	0.001321	0	0.000421	0	0.003180	0.006544
40-44	0.000136	0.000205	0.001841	0.000409	0.002113	0	0.000546	0	0.005309	0.010559
45-49	0.000137	0.000274	0.006362	0.000892	0.005407	0	0.001029	0	0.004451	0.018552
50-54	0.000164	0.000328	0.010046	0.001394	0.008419	0	0.001558	0	0.006790	0.028699
55-59	0.000381	0.000667	0.019539	0.002665	0.015699	0	0.002855	0	0.012126	0.053931
60-64	0.000450	0.001051	0.045855	0.011204	0.020822	0	0.003149	0	0.022147	0.104677
65-69	0.000512	0.001535	0.077542	0.016600	0.024308	0	0.004768	0	0.029306	0.154589
70-74	0.001016	0.002539	0.133176	0.028893	0.042226	0	0.008108	0	0.048836	0.264794
75-79	0.001569	0.004311	0.214126	0.045829	0.067006	0	0.013281	0	0.069989	0.416210
80+	0.003044	0.009116	0.430771	0.100671	0.146039	0	0.029012	0	0.174839	1.000000

Table C8. Net probability of dying for females 1987 ${}_nq^j_x$.

Age-groups	1.Tubercul osis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intsstinal	8.Pediatric Disorders	9.Others	All causes
0	0.0000000	0.002342	0.001258	0.023013	0.000738	0	0.007915	0.006881	0.001519	0.043665
1-4	0.0000000	0.000405	0.001012	0.007928	0.000434	0	0.001359	0.000637	0.005628	0.017403
5-9	0.0000000	0.000127	0.000317	0.000253	0.000158	0	0.000032	0.000095	0.001329	0.002311
10-14	0.0000000	0.000099	0.000198	0.000132	0.000099	0	0.000000	0.000066	0.000759	0.001353
15-19	0.0000000	0.000168	0.000402	0.000168	0.000335	0	0.000067	0	0.001240	0.002381
20-24	0.0000000	0.000213	0.000497	0.000213	0.000461	0	0.000071	0	0.001631	0.003086
25-29	0.0000000	0.000258	0.000590	0.000221	0.000516	0	0.000111	0	0.001878	0.003573
30-34	0.0000000	0.000184	0.000826	0.000184	0.000918	0	0.000184	0	0.001881	0.004176
35-39	0.0000000	0.000178	0.001069	0.000178	0.001247	0	0.000178	0	0.002374	0.005225
40-44	0.0000000	0.000236	0.001021	0.000236	0.001414	0	0.000236	0	0.002041	0.005183
45-49	0.0000000	0.000154	0.003835	0.000231	0.002763	0	0.000307	0	0.002150	0.009439
50-54	0.0000000	0.000285	0.006152	0.000285	0.004168	0	0.000569	0	0.003506	0.014966
55-59	0.0000000	0.000457	0.011135	0.000571	0.006945	0	0.001028	0	0.006945	0.027082
60-64	0.000150	0.000299	0.022479	0.005071	0.004327	0	0.001643	0	0.010561	0.044530
65-69	0.000164	0.000492	0.041809	0.007520	0.006216	0	0.002294	0	0.015150	0.073646
70-74	0.000426	0.000852	0.084659	0.015244	0.012929	0	0.004892	0	0.030906	0.149908
75-79	0.000762	0.001523	0.143514	0.025136	0.020899	0	0.007847	0	0.051703	0.251383
80+	0.001957	0.003632	0.320367	0.062488	0.052523	0	0.020288	0	0.128292	1.000000

Table C9. Contribution to changes of e_0 by age and cause of death, 1957-1968

Age-groups	1.Tuberculosis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.059	0.335	-0.014	-1.060	-0.016	0	0.717	-0.072	0.826	0.775
1-4	0.132	0.340	0.053	0.829	-0.016	0	0.922	0.308	0.629	3.197
5-9	0.030	0.048	-0.005	0.176	-0.015	0	0.024	0.007	0.062	0.327
10-14	0.052	0.035	0.017	0.061	-0.007	0	0.009	-0.002	0.078	0.243
15-19	0.024	0.014	0.027	0.027	-0.017	0	-0.011	0	0.081	0.145
20-24	0.066	0.009	0.020	0.022	-0.016	0	0.011	0	0.070	0.182
25-29	0.114	-0.013	0.018	0.034	-0.018	0	0.016	0	0.131	0.282
30-34	0.099	0.025	0.005	0.040	-0.050	0	-0.005	0	0.112	0.226
35-39	0.083	0.006	0.018	0.059	-0.044	0	-0.004	0	0.075	0.193
40-44	0.137	0.005	0.045	0.075	-0.014	0	0.011	0	0.045	0.304
45-49	0.101	0.018	0.018	0.071	-0.080	0	0.009	0	0.153	0.290
50-54	0.082	0.010	0.084	0.087	-0.106	0	0.025	0	0.123	0.305
55-59	0.136	0.036	0.047	0.045	-0.191	0	0.013	0	0.108	0.194
60-64	0.014	0.004	-0.134	-0.074	-0.165	0.449	-0.016	0	0.037	0.115
65-69	0.007	0.002	-0.195	-0.107	-0.194	0.520	-0.029	0	0.010	0.014
70-74	0.014	0.003	-0.187	-0.099	-0.194	0.627	-0.024	0	0.023	0.163
75-79	0.010	0.005	-0.207	-0.102	-0.176	0.562	-0.021	0	-0.002	0.069
80+	-0.003	0.001	-0.233	-0.116	-0.167	0.270	-0.027	0	-0.038	-0.313
Total	1.157	0.883	-0.623	-0.032	-1.486	2.428	1.620	0.241	2.523	6.711

Table C10. Contribution to changes of e_0 by age and cause of death, 1968-78

Age-groups	1.Tuberculosis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6.Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.008	0.236	-0.006	0.148	-0.032	0	0.468	0.191	-0.006	1.007
1-4	0.005	0.126	0.009	0.363	-0.031	0	0.141	-0.005	0.042	0.650
5-9	0.007	0.029	0.025	-0.001	-0.017	0	0.008	-0.001	0.052	0.102
10-14	0.005	0.017	0.016	-0.005	-0.015	0	0.003	-0.001	0.022	0.042
15-19	0.014	0.013	0.017	0.004	-0.003	0	0.014	0	-0.011	0.048
20-24	0.014	0.015	0.024	0.006	0.001	0	0.016	0	0.001	0.077
25-29	0.020	0.016	0.022	0.003	-0.002	0	0.014	0	-0.002	0.071
30-34	0.024	0.014	0.027	0.006	0.009	0	0.014	0	0.004	0.098
35-39	0.027	0.014	0.025	0.001	0.005	0	0.013	0	-0.003	0.082
40-44	0.035	0.022	0.038	0.007	0.023	0	0.024	0	0.019	0.168
45-49	0.021	0.009	0.028	-0.020	0.001	0	0.010	0	-0.034	0.015
50-54	0.036	0.013	0.053	-0.015	0.042	0	0.022	0	-0.024	0.127
55-59	0.045	0.019	0.072	-0.016	0.106	-0.021	0.028	0	-0.036	0.197
60-64	0.024	0.011	0.079	-0.033	-0.056	0.186	0.007	0	-0.104	0.114
65-69	0.024	0.013	0.067	-0.086	0.030	0.167	0.005	0	-0.148	0.072
70-74	0.022	0.012	-0.003	-0.148	0.013	0.149	-0.004	0	-0.225	-0.184
75-79	0.020	0.008	-0.007	-0.138	0.029	0.139	-0.001	0	-0.223	-0.173
80+	0.020	0.007	0.055	-0.080	0.059	0.138	0.001	0	-0.146	0.054
Total	0.371	0.594	0.541	-0.004	0.162	0.758	0.783	0.184	-0.822	2.567

Table C11. Contribution to changes of e_0 by age and cause of death, 1978-1987

Age-groups	1.Tuberculosis	2.Infect. & Parasitics.	3.Cardiov. Diseases	4.Respirat. Diseases	5.Cancers	6. Old age	7.Gastro-Intestinal	8.Pediatric Disorders	9.Others	All causes
0	0.015	-0.133	0.051	1.447	0.008	0	0.147	0.426	0.177	2.138
1-4	0.006	-0.012	-0.024	0.021	0.018	0	0.078	0.070	-0.207	-0.050
5-9	-0.001	0.008	-0.008	0.019	0.019	0	0.004	-0.003	-0.023	0.015
10-14	-0.001	0.004	-0.005	0.015	0.014	0	0.004	-0.002	-0.009	0.020
15-19	0.002	-0.004	-0.005	0.002	0.007	0	0.001	0	0.000	0.003
20-24	0.002	-0.005	-0.007	0.001	0.004	0	0.001	0	-0.030	-0.034
25-29	0.002	-0.005	-0.005	0.002	0.009	0	0.003	0	-0.002	0.004
30-34	0.004	-0.003	-0.005	0.004	0.010	0	0.001	0	-0.001	0.010
35-39	0.007	-0.004	-0.001	0.008	0.018	0	0.006	0	0.030	0.064
40-44	0.007	-0.007	-0.005	0.004	0.010	0	0.003	0	0.015	0.027
45-49	0.014	-0.006	-0.066	0.053	0.042	0	0.007	0	0.024	0.068
50-54	0.017	-0.007	-0.090	0.067	0.047	0	0.010	0	0.027	0.071
55-59	0.025	-0.009	-0.157	0.093	0.003	0.022	0.012	0	0.028	0.017
60-64	0.009	-0.007	-0.183	0.129	0.118	0.058	0.018	0	0.040	0.182
65-69	0.013	-0.009	-0.293	0.198	0.075	0.113	0.025	0	0.098	0.220
70-74	0.013	-0.010	-0.381	0.234	0.061	0.152	0.024	0	0.133	0.226
75-79	0.010	-0.010	-0.450	0.192	0.020	0.138	0.009	0	0.115	0.024
80+	0.005	-0.010	-0.639	0.078	-0.057	0.103	-0.009	0	-0.063	-0.592
Total	0.149	-0.229	-2.273	2.567	0.426	0.586	0.344	0.491	0.352	2.413