Nutritional Surveillance in Ireland 1993

National Nutrition Surveillance Centre
University College Galway

Nutritional Surveillance in Ireland 1993

National Nutrition Surveillance Centre
University College Galway

Centre for Health Promotion Studies
University College Galway
Ireland

Series Report: 1

A paperback original first published in 1993
by the National Nutrition Surveillance Centre
at the Centre for Health Promotion Studies
University College Galway
Ireland

ISBN 0951947737

Page makeup by the
National Nutrition Surveillance Centre
Centre for Health Promotion Studies
University College Galway
Ireland

Printed by Standard Printers, Galway, Ireland

Acknowledgements

This report was researched, prepared and published by the National Nutrition Surveillance Centre, Department of Health Promotion, UCG.

The principal authors are :-

Mr. John Newell MSc.
Ms. Geraldine Nolan BSc., Dip Nutrition & Dietetics, MINDI
Professor Cecily Kelleher MD FRCPI MPH MFPHM MFPHMI

The authors wish to acknowledge the following people, who while not being directly involved or responsible for contents of report, were helpful in its development.

Within our Department:-

Dr. Phil Brennan
Mr. Brendan Dineen
Dr. Ann Hope

Outside the Department: -

Ms. Ursula O' Dwyer
Mr. John O'Toole,
Mr. Gerry Guidan,
Department of Health

Mr. Chris Barry
Ms. Dorothy Burke
Ms. Sinead Lynch
Mr. John McDonough
Ms. Finola Mee
Ms Grainne Mugan
Systems Analysis Project Group
Dept. of Accountancy & Finance,
University College Galway.

Dr. Emer Shelley, Nutrition Advisory Group

Professor. Pat Fottrell,
Department of Biochemistry, University College Galway

Dr. Paddy McNutt,
Centre in Economics and Law, University College Galway

Dr. Ronan Gormley
Dr. Dermot Harrington
Teagasc Agriculture and Food Development Authority

and to the to those in the various organisations who agreed to contribute to our database and whose publications are listed in the references.

To Aileen Glynn for her secretarial assistance.
Front cover design by Kevin Newell.

Contents

Chapter One

General Summary

1.1: Overview

We aim in this report is to provide a general overview of routinely available data from each part of the food chain and to relate that information to human health. The information is intended as an accessible reference resource for those involved in food and dietary policy at National, Regional and local level. It provides a summary for each sector, of information available from other sectors. It is also of interest to scientific researchers. Finally, it has been written to make it as accessible as possible to the key player in the food chain, the consumer.

This is the first report of the series. It is intended to produce more in-depth reports on sub issues annually and in the interim to provide reference to available information sources for those who require it.

The documents considered for the report were all those available to us from a variety of relevant sources during 1992-3. As far as possible the figures are up to date but it should be noted that they are derived from published data at the time of going to press. We acknowledge copyright source to each relevant publication or source (see references). It has not always been possible to reproduce commercially marketed reports where that might conflict with the sales strategy of the individual item though we do have access to such material with the co-operation of the authors. The chapter on history of the Irish diet is the one exception to the use of current data only, for obvious reasons.

Nutrition Surveillance is therefore concerned principally with the utilisation of existing data from all relevant sources. These data may be descriptive or analytical but are produced by a variety of bodies and agencies. The key is to co-ordinate this information so that a) different sectors can be made aware of their impact on each other and b) easily accessible, comprehensible information is available to all concerned with its use. It is a practical function that helps to simplify an otherwise complex and ramified issue. Its importance is undoubted.

The object of this report is (necessarily) not to interpret beyond its brief and we have therefore tried to present the available information in a balanced and even-handed way. However, the primary purpose is to monitor food production and supply in so far as it

is likely to have an impact on the public health. In that respect, we hope in this chapter to draw together the main conclusions from the following chapters. Secondly, we have emphasised particularly conditions that account for major influences on public health so in that sense we have been selective. There are many diverse conditions where diet has a role, but for this first report we have examined the most important. Finally, it should be understood that the periodic reports are to be distinguished from the other activities of the surveillance centre. At any one time we hope to have available up to date information from across sectors, thanks to the information network we have now established.

1.2: Executive Summary

- There are some key deficiencies in routinely collected data at present in relation to health status. These should be standardised and carefully examined. In particular, more co-ordination of morbidity data through the general practice and hospital network is needed and standardisation in relation to information collected on child health. Absence of such data precludes coherent strategic planning.

- The increases in some cancers that might have a dietary association merit further study in an Irish context, particularly the interaction between diet and other lifestyle and environmental variables. Epidemiological surveillance between countries with Ireland as a participant is one useful approach.

- There will continue to be declines in coronary heart disease which do relate to changes in risk factor patterns. This will probably begin to show the kind of class gradient being demonstrated in other countries however and the dietary patterns of the economically disadvantaged are not encouraging.

- The level of knowledge in relation to types of dietary fat consumption is limited. Given that there are signs elsewhere that total fat intake might remain relatively unchanged while the proportions of some saturated fats decline this would be of practical importance. The problem is primarily a methodological one in relation to the development of appropriate software to analyse the hidden fat content of different foods. Given the importance of cardiovascular disease as a contributor to morbidity and mortality in this country and the need to provide clear public health guidelines that are as constructive as possible for indigenous food industries such information must be acquired and monitored.

- There is some evidence of mis-information and targeting of 'bad foods' rather than an emphasis on an overall healthy diet. This needs to be considered more fully in public health campaigns. The data from marketing sources is illuminating in its presentation of relevant messages. The public sector has much to learn from the private sector in this respect.

- There is patchy information only on major population sub-groups, particularly the elderly and the economically disadvantaged. Again, such information will be critical for focused strategies for change.

- Given the increased research interest in perinatal and intrauterine influences on later adult chronic diseases the low breast feeding rates and poor weaning practices ought to be more closely examined in an Irish context.

- There is evidence that young people are pursuing the kind of low fibre high fat diet that is not ideal and this must be addressed as part of the framework approach to health promotion.

- For understandable reasons the food industry is attempting to follow market forces. Many of the proposed product lines are less than ideal from a public health perspective however. Equal attention should be given to sectors where there has been growth as in the fishing and horticultural field for instance.

1.3: Chapter Summaries

Chapter 2 defines nutrition surveillance and summarises the diverse sources of information on which the present report is based. We have also described how the surveillance centre database is organised and how interested groups might avail of its facilities should they wish to do so. We were in general very pleased at the support we received from the many agencies and groups contacted. There were some difficulties in identifying contact personnel in some organisations which we redressed in large measure by utilising existing publications. This was more particularly so for the private or commercial sector compared with the public sector generally. Information was specifically poor in the retail area. We hope that will be redressed in future, especially when such groups identify the reciprocal nature of a surveillance service.

Chapter 3 examines the history of the Irish diet. One key issue raised by those who suspect public health programmes to change our eating patterns is that the traditional Irish diet has always been one dependent on animal produce and hence with a high intake of saturated fat. This is a separate argument to be distinguished from whether or not saturated fat intake contributes to coronary heart disease and it deserves to be examined on its own merits. It is a reservation also repeatedly expressed by members of the general public and so must be seen as a commonly held social attitude.

A review of available historical data does not however support this view. The diet consumed up to the 18th century was varied, but predominantly carbohydrate based. It was only from the middle of the 19th century that dairy produce and animal rearing practices began to produce the diet now regarded as typical. This pattern of increased fat consumption has been escalating throughout this century, largely associated with changes in retail and supply practices. In the last decade this may be altering again however as people become more aware of the influence of diet on their health (see chapter 6; The Food Chain: Retail and Supply). The pattern of diet-related morbidity

and mortality over time is also reviewed later (chapter 4: The Health Status of the Irish Population). The impact of this change on nutritional status will be discussed further (chapter 7: Dietary Intake of the Irish Population).

Chapter 3 also compares dietary intake at different time points over the last hundred years. The differences in total calorie intake are marked, as are the changes in relative fat consumption. Total calorie intake was much greater, particularly among men and those engaged in physical labour. Exercise rates have declined and obesity has become more prevalent. Other risk factors for cancer and heart disease, such as smoking, were negligible in scale until this century.

Chapter 4 is concerned with the measurement of health status. Firstly, general factors are considered including life expectancy at different ages in this country and in comparison with other European countries. It can be seen that while all populations are "greying", by which we mean that more people are living longer, in Ireland we live relatively less long than our European neighbours. This is particularly the case for women. Again, it is a misconception frequently quoted in the scientific and general literature, that those in countries with a Mediterranean diet live no longer. The difference in standardised life expectancy between Greece and Ireland for instance is at least four years. Such data do not of course tell us what the causes of these differences are. For that we must look at patterns of disease.

A number of indicator conditions have been monitored to assess their incidence, prevalence and mortality rates, where applicable. We find that morbidity data are still less than adequate in the country. This will be a subject for our next report. We were to a large degree dependent on HIPE data that are not expressed in a way that is particularly useful to us since they are collected for other purposes. We also used information from occasional databases such as the Kilkenny Health Project. Since this is now at an end, the fate of components such as its ad hoc cardiovascular registry is in some doubt. Other important registries such as the National Tumour Registry, are now establishing themselves. Again, data on childhood anthropometric measures is diverse and not easily accessible from one health board to another. This too could form a future minor report for the surveillance centre.

Examination of specific outcome indicators reveals that Irish people have high rates of coronary heart disease. The rates have at last started to decline, but that rate of decline is slower that our neighbours in the United Kingdom and is less steep than in Northern Ireland. Rates of some cancers are also relatively high, and the incidence of breast cancer at least seems to be increasing everywhere, particularly in Ireland. This is not an effect of the ageing population profile.

We know something about changing risk factors, particularly from the Kilkenny Health Project. Levels of cholesterol have fallen since the baseline survey in 1985, as have smoking rates. These gains are not confined to the project area and the possibility both of contamination (i.e. wider than anticipated spread of the message) and of non project related lifestyle changes must be considered. However, rates of overweight and obesity are still high. There has been much recent discussion in Ireland about diet as an

independent risk factor for heart disease, the view being expressed that dietary change is a coincidence and it is the other risk factors that are important. To isolate fat intake as an innocent contributor to coronary heart disease is no more logical than the converse position however. Risk factors interact to produce the pathological process that leads to heart disease. The Japanese had negligible rates of heart disease while they maintained a remarkably low fat diet, though suffering the other ill-effects of smoking. It is only now with changes towards a more westernised diet that they are starting to show increased rates of heart disease in age specific groups. The Japanese also demonstrate the fallacy that heart disease is an illness of ageing since they are the longest lived of all human populations without having previously suffered on a large scale from this disease.

Chapter 5 examines the first three stages of the food chain, namely food production , distribution and supply. This is the first National Nutrition Surveillance report to examine this issue in detail. The recently produced report by the expert committee appointed by the Minister for agriculture, food and fisheries, makes welcome reference to the importance of nutrition as a consideration in policy and the department of Health was represented in its formulation. This is to be heartily welcomed as it is strongly in the National interest to continue to support an active economy that provides much needed employment and builds on our natural resources. One impact factor in dictating the direction of that industry that will be increasingly relevant to the acceptability of Irish products is consumer reaction to its health implications.

The chapter examines firstly the profile of the Irish workforce. There has been a relative decline in those engaged in farming but it is still a significant employer relative to other European countries. The historical trends in farming continued up to and beyond the entry to the EC and the Common Agricultural Policy. The style of farming is now heavily dependent on dairy farming and livestock, particularly cattle. Recommendations of the Expert Committee report include examining more closely seasonality in relation to production. Ireland has not traditionally been a producer of applied dairy products compared with other countries. The CAP has to a large extent created a situation whereby the producer was relatively insulated from market forces. However, examination of import and export patterns reflect changes in consumer demand for a variety of products. It can be seen that more fish is being consumed and there is a change in the market share of so-called healthier options such as low fat spreads and mayonnaise. The recommendation is largely to develop indigenous industry to match that demand, which is to be expected as a logical consequence. Many of these foods are of the processed or convenience type which might be expected to shift the total diet towards a relatively low fibre high fat intake. There has also been a highly significant growth in the fish industry at all levels.

Chapter 6 continues to examine the food chain looking at retail patterns and consumer demand. Again, this is a sector which has changed remarkably during this century, as methods of food preservation and transport have improved, providing a more varied and often exotic choice and range of foodstuffs. In more recent years the traditional multi-function small grocery and public house has declined markedly in favour of the supermarket. There has been a growth in Fast Food outlets and smaller newsagents and sweet shops. The market share is dominated by a small number of

retail chains, though their distribution differs across the provinces. While the stock range appears to be controlled by a small number of buyers there is some evidence of variability according to location, presumably dictated by customer profile. What is not so clear is whether the type of product available reflects the client or vice versa. There is also a change in the pattern of consumption, reflected in a large growth in restaurants and evidence from several sources of a pattern of eating called grazing. This implies convenience eating on the move and is marked among young people. There are also changes apparent in the Drinks industry, whose total annual turnover is the equivalent of the entire National budget on the Health Sector. In particular there has been a shift to off-licence retail and an increase in the market share for wines.

Chapter 7 examines diet and food consumption in more detail, particularly from a nutritional perspective. A number of sources are quoted here, the main contemporary data-source being the National Nutrition Survey. While this is an indispensable data-source it was not possible to examine in depth the dietary intakes of sub-populations or to infer more specific information on certain foods and nutrients. A follow-up in children's eating patterns was also undertaken. We are otherwise reliant for the most part on occasional surveys undertaken through various academic departments.

There were some marked changes since the last detailed major survey undertaken in 1947. Total calorie intake has declined still further. Total fat intake shows considerable variation with disturbing signs of a high intake in middle-aged men. The diet is the more remarkable for its deficiencies however. The intake of fibre sources and of fruit and vegetables is well below recommended levels. There were signs of micro-nutrient deficiencies particularly of iron. The available studies show a consistency that supports the validity of the findings, in that the study in Kilkenny is similar. What should be noted however is that the fat intake is often in hidden sources, like chipped potatoes, cakes and confectionery. The traditional sources, as echoed in other parts of the report may not be making the contribution understood in the public mind. There is a danger of victimising individual food items at the expense of a balanced review of the diet as a whole. It is also likely that the chief sources of fat in the Irish diet are saturated, though this could not be directly measured. However, butter consumption has plummeted in favour of all kinds of spreads and we are actually the lowest cheese eaters in Europe. Children are snacking at night and consuming convenience products in large volume that are high in fat. Dental health in Ireland has improved in relation to water fluoridation but hygiene habits of brushing at night would presumably require careful attention, particularly in relation to sugar intake.

Our information on other sub-groups of the population is limited. Women in the lower socio-economic groups are deficient in a number of key micro-nutrients including vitamin C. There is little available information on the diet of older people, not least because representative studies are not available. Infant feeding practices also merit some attention. There has been recent focus on the prevalence of iron deficiency in the weaning period due to poor practice and we continue to have astonishingly low breast feeding rates, notwithstanding a class gradient with highest levels among the upper socio-economic groups.

The principal comparisons of interest are between ourselves and our neighbours in the United Kingdom. Total fat intake in Northern Ireland is higher than in the Republic for

instance. The so-called "French Paradox" has been closely studied in recent years. There coronary heart disease has a low incidence and mortality, although total fat intakes are similar between the two countries and risk factor rates comparable. There are some notable extenuating factors however. Firstly, within France itself there is a declining gradient from North to South as one moves towards the Mediterranean. This is in keeping with the risk factor profile. Secondly, alcohol consumption differs markedly and red wine may have specific protective properties. Finally, differences in food preparation techniques may be relevant, particularly in relation to micro-nutrient intake.

Chapter 8 examines in more detail the social profile of the consumer, particularly from his or her own perspective. It looks firstly at the demographic changes influencing consumer demand, including the growth in the number of older people and the likely impact of unemployment on spending power. The change in the traditional nuclear family, with a shift away from the mother as the principal purchaser, will also have an impact on diet. There are indications from various consumer and attitudinal surveys that housewives are influenced by the needs of spouse and children in what they buy and prepare and what they eat themselves. The increase of household appliances including the microwave further influence preparation. There continues to be urban rural differences in the consumption of staples like milk and dairy products generally.

The key role of diet as a perceived influence on health is re-enforced by surveys. However, the concerns are focused as much on additives and preparation methods as on the main nutritional components. There is evidence of widespread albeit minor misconceptions as well.

Chapter Two

The Concept of Nutrition Surveillance

2.1: Introduction

In its broadest sense, Nutritional Surveillance can involve any factors that influence food consumption patterns and nutritional status in a society. It is intuitively understandable that the food a society produces will to some degree determine and be determined by patterns of consumption. In turn access to that food will depend on a variety of practical factors, including means to purchase and prepare food, personal tastes and preferences and social customs governing dietary habits. Diet is one major environmental factor implicated in the determination of health and its converse, disease. There is therefore a long and involved chain which needs to be considered in trying to describe nutritional status of a population, and further, to determine how trends for change in any component of that chain might subsequently influence health outcome.

The concept of nutritional surveillance was initially applied in developing countries where many of the factors in the chain undergo fairly acute flux and where the disease processes in question were more often those associated with deprivation and food shortage. However, just as epidemiology as a discipline had its roots in short-term communicable disease and became more applicable in chronic disease, so too, nutrition surveillance came to be regarded as an important monitoring process. This is the more critical as social and economic patterns have changed. We are dealing with a complex food chain where supply of food may be determined by local, regional, national and even international policy.

In developed countries, the undoubted relationship between diet and the epidemic chronic diseases has led to efforts for focused public health strategies to modify dietary behaviour and hence reduce ill health. This report is based on the presentation of existing data from publicly available sources of information on factors currently regarded as relevant to that debate. It is not intended to explore the underlying theoretical basis for these assumptions except where it is directly relevant. Moreover, references are available for further reading should interested readers wish to consult the Surveillance Centre.

The Department of Health in its document "Health, the Wider Dimensions" in 1987 recognised the wider sphere of influence on health status. A critical aspect to this is the nutritional status of the population. In Ireland, for instance, we have one of the highest rates of coronary heart disease in the developed world and also high levels of

colon cancer, two examples of conditions held to be associated with dietary factors. Other obviously diet related conditions include diverticular disease and osteoporosis.

2.2: Sources of Information

There is already considerable available data on health status indicators being collected by statutory and voluntary agencies. These include mortality data (death rates from specific conditions) morbidity and health service data (illness rates from specific conditions, together with information on their management), anthropometric information about children (their size at different age points). Nutritional status has been ascertained in periodic surveys. There is also considerable information on food production, supply and consumption. All this is routinely collected by a variety of official Public and Voluntary Agencies across sectors, including health, agriculture, industry and commerce. In addition, the scientific literature produces periodic information an aspects of current specific interest.

2.3: History of Nutrition Surveillance in Ireland

In the mid-eighties, a surveillance centre in Trinity College Dublin was initiated by Dr. Alan Kelly with the support of the Department of Health. Alan Kelly was funded under an AFT (An Foras Taluntais) grant in 1980 and 1981 to develop a Food and Nutritional Surveillance System. He was located in Trinity College Dublin and worked under the supervision of Professor J. Kevany. Two reports were produced, the second and last of these in 1985. The work was also reported at a meeting of the Statistical and Social Inquiry Society of Ireland in April 1981. At the second AFT/MRC Workshop in Human Nutrition held in UCG in 1980, the Steering Committee endorsed a proposal for the establishment of the Nutritional Surveillance System. This proposal was forwarded to the Minister of Health for consideration. Subsequently, funding was made available by the Department of Health and Alan Kelly commenced work on the Nutritional Surveillance System in Trinity College Dublin under the direction of Professor John Kevaney. A Technical Interpretation Committee was set up in 1985 to assist the work. Subsequently, Alan Kelly contributed to the concept of nutrition surveillance while working abroad.

This current initiative, again supported by the Public Health Division of the Department of Health, is an attempt to re-establish a Nutrition Surveillance Centre. A major practical reason for the existence of such a facility is the lack of an organised information base readily available to health policy planners, researchers and health professionals. Lack of data co-ordination can result in duplication of effort and unnecessary repetition of research.

There was felt to be a clear need to establish a centralised source of information with three functions:

1. *To provide relevant information in an accessible form at short notice.*

2. *To monitor trends in health status correlated with food supply and consumption and advise on these findings for health planners*

3. *To provide a source of information and research expertise, particularly in epidemiological or surveillance methodology to those wishing to mount specific projects such as microsurveys.*

It might be added that more than ever, this kind of service is necessary as increased emphasis moves to primary care, preventive medicine and general health promotion strategies. The complexity of achieving lasting lifestyle changes on a long-term basis for the benefit of the Public Health means that these measures are necessary.

2.4: National Nutrition Surveillance Centre

The Department of Health, in recognising the importance of re-establishing an operating surveillance mechanism, confirmed the siting of the new National Nutrition Surveillance Centre at the Department of Health Promotion in University College Galway in February 1992. Since that time we have been engaged in establishing the database. This is our first report.

The Department of Health Promotion is a Public Health Department with access to a multidisciplinary Centre for Health Promotion Studies This unique intersectoral Centre involves a spectrum of collaborators across faculties with the University and beyond it and so affords the resources and advantages of these facilities and the services of staff members who can contribute to its ongoing work. At present, the duties of the Surveillance Centre are supported by the existing Departmental staff. In addition, Mr. John Newell, M.Sc. took up the post of data co-ordinator in September 1992 and Mrs. Geraldine Nolan, B.Sc., Dip Nutrition and Dietetics commenced work as a part-time researcher for the Centre in June 1992. To date, the principal available sources of data in relation to health status and food production, retail, supply and consumption have been identified. The present report concerns the presentation of these data. It is planned to produce a major report every 5 years and periodic or occasional reports and surveys in the intervening time period. In addition to its role of data co-ordination, it is also envisaged that the Nutrition Surveillance Centre would have an advisory role in the area of further research development.

2.5: The Organisation of the Surveillance Centre Database

The NNSC has at its access two separate databases, NNSC Database and Trends, the first dealing with data in report, book or other published format, the latter dealing with raw data supplied from various sources including the Central Statistics Office and WHO EuroStat .

1. NNSC Database

This database information system consists of two main components:

1. The first component may be described as a subject, title and location catalogue. All reports, articles, and other information sources. are referenced in this catalogue. Details such as the title, author, location, abstract and main chapters are recorded for each new report/article etc. the NNSC receive. This component allows an end user to retrieve the above details for any reference or references by one of two methods:

(a) Fixed Search

All references are organised and stored in the database according to a hierarchy of keywords, the top level constituting *Food Groups, Nutrients, Diseases, Population Subgroups*. The highest level of keywords are referred to as groups in both the system documentation and the application. On receiving a request for information on a particular topic, an NNSC staff member may select an appropriate group and keyword and subsequently all associated references are displayed on screen. The end user may then use the displayed details to locate the referenced reports/articles.

(b) Free Form Search

This method of retrieval may be used when the title of a specific report/article is known. On entering this information, the remaining details of the reference are retrieved from the database and displayed on screen.

2. The second component of the information system primarily involves the computerisation of all contact people with whom the NNSC interact. These contact people are categorised by organisation.

2. Trends

The second database Trends allows the user access to hundreds of Irish food and nutrient indicators. These indicators have been compiled from data collected from the Central Statistics Office Data bank, Eurostat in Geneva and other sources. Most data series date from late 60's to present day, and output is in both graph and tabular form allowing full export facilities.

2.6: Definition of Nutrition Surveillance

This section provides a brief overview on nutritional surveillance. It includes the main definitions, objectives and the basis of nutritional surveillance. The status of nutritional surveillance in Europe is also summarised.

The following definitions have been proposed to describe nutritional surveillance:

"The systematic collection, collation and analysis of data which informs the Government about the nature and causes of the diseases present". (W.P.T. James and A. Ralph. 1991)

"...means to watch over nutrition, in order to make decisions which will lead to improvements in nutrition in populations." (Joint FAO/UNICEF/WHO Expert Committee, 1976)

Nutritional Surveillance System-analyses the occurrence in a population of dietary mediated nutritional conditions, with the objective of describing the current situation, detecting trends, forecasting changes, highlighting priorities and targeting corrective and preventive measures. (Joint FAO/UNICEF/WHO Expert Committee 1976.)

2.7: General Objectives

The general objectives of national nutritional surveillance are understood to be:

(i) To describe the nutritional status of a population with particular reference to defined subgroups who may be at risk.

(ii) To provide information that will contribute to the analysis of causes and associated factors, and permit selection of preventive measures, which may or may not be nutritional (e.g. smoking.)

(iii) To promote decisions by governments concerning priorities and disposal of resources to meet the needs of both normal development and emergency situations.

(iv) To enable prediction to be made on the basis of current trends in order to indicate the probable evolution of nutritional problems which will assist in the formation of policy.

(v) To monitor nutrition programmes and evaluate their effectiveness.

(vi) To develop intersectoral co-operation through the planning, management, and delivery of health care, as with the agricultural, industrial and commercial sectors.

2.8: Basis of Nutrition Surveillance

Food and/or nutritional surveillance is based on the use of routinely collected or easily generated data from several sectors related to nutrition and health.

They include:

(i) ***Food Consumption Data.***
Such information may be compiled from a variety of occasional or periodic surveys and from sources such as the 7 yearly representative Household Budget Survey.

(ii) ***Health Policy Indicators*** - established targets for improving health (e.g. *Framework for Action*, the Department of Health's guideline document produced in 1992, or *Health for All by year 2000*, produced by the European Regional office of the World Health Organisation).

(iii) ***Social and Economic Indicators related to Health*** - for instance differences in causes of illness and death according to age, social class, sex, race, or geographic location.

(iv) ***Indicators of the Provision of Health Care*** - these might include access to health services by different groups and individuals, or resource allocation generally in health boards and other statutory and voluntary agencies throughout the country.

(v) ***Health Status Indicators*** - causes of morbidity (illness), mortality (death) or known patterns in relation to key risk factors (for instance diet high in fat, particularly saturated fat and cholesterol] and assessment of their distribution in population subgroups at risk.

(vi) ***Nutritional Knowledge of the Population***
The main considerations are:

- Assessment whether the population possesses the knowledge to choose foods and preparation methods wisely.
- Overview of recommendations being transmitted to the public. These include cancer and heart disease prevention organisations, nutritional societies, consumer groups, periodicals. An overview of these messages, their content, and perhaps also their frequency and penetration, would be useful knowledge in assessing nutritional status and the forces influencing it, as well as understanding what is influencing behaviour in the population.

- Overview of multipliers -an inventory of the organisations that are or can be involved in implementing nutritional recommendations and enhancing nutritional knowledge is an important resource for policy and intervention planning E.g.. health departments, General Practitioners, Educational Institutions, Dieticians, Nutritionists, Nutrition Societies, Consumer groups, Pharmacists, Self-Help Groups for dieters, can all play a role in the transfer of knowledge and change of behaviour.

(vii) ***Food Production and Supply***

This includes all data on production produced by statutory bodies such as the Department of Agriculture, semi-state or advisory boards such as Bord Iascaigh Mara (BIM), An Bord Bainne, CBF, the meat Marketing Board. Processors and retailers, mainly commercial in nature are also included.

2.9: Situation in other Countries at Present

The following examples are presented for comparative purposes. This is not meant to be an exhaustive list. For further reading, see bibliography.

EUROPE

The classic approach to nutritional surveillance involves evaluation of:

* national food production
* regional patterns of household expenditure on food
* household studies of food purchases and consumption at home and at the workplace.

or occasionally

* studies of individual consumption.

These studies are usually in the province of the Ministries of Agriculture and contribute to the Food and Agriculture Organisations' data on national food balance sheets. The Statistical Office of the European Community is compiling harmonised information for all its constituent nations and relies particularly on data on expenditure from household budget surveys.

The **United Kingdom** is the only European country with a dedicated household budget survey. The main users of the information appear to be the food industry which is now required to buy the detailed information. The surveys are therefore essentially part of a Dietary Surveillance System and by not incorporating or linking with health issues cannot be considered a primary component of Nutritional Surveillance. To get information about the dietary intake in different countries in

Europe, several sources of information are available:

(i) ***Food Balance Sheets***

The crude statistics based on food production in a country are modified to take account of food imports and exports and are collected annually by most Ministries of Agriculture for collation, standardisation and presentation as food balance sheets on a common basis by the Food and Agriculture Organisation of the United Nations (FAO).

These figure encompass regional and seasonal variations. They account for waste during the marketing and distribution of food but not that in home preparation and consumption. They therefore overestimate total food intake.

(ii) ***International Monitoring Projects (Examples)***

MONICA Project

This project is designed to collect information on trends in cardiovascular diseases and risk factors for these diseases. This project is being carried out in Europe in Belgium, Czechoslovakia, Denmark, Finland, France, Germany, Hungary, Iceland, Italy, Ireland, Poland, Romania, Scotland, Spain, Sweden, Switzerland and former Yugoslavia for males and females in the age range 25-64 years.

Information is collected about the qualitative aspects of the diets for all persons participating in this project. In some participating countries more detailed dietary information is being collected for men aged 45-64. These countries are Belgium, Denmark, Finland, France, Germany, Ireland, Poland and USSR.

EURONUT Project

The aim of this study is to explore dietary patterns in the elderly living in different European communities. It is an example of a valid tool to describe differences in dietary patterns between the European countries (Belgium, Czechoslovakia, Denmark, France, Greece, Hungary, Italy, The Netherlands, Norway, Poland, Portugal, Spain).

(iii) ***Aetiologic Studies***

Seven Countries Study

Five of these countries are in Europe; Finland, Greece, Italy, the Netherlands and Yugoslavia. For this study, males aged between 40-59 years were selected. In three of the five European countries, Finland, The Netherlands and Italy, data on food consumption by individuals was also collected. Based on the data, the relationship between diet and disease can be studied in five cohorts in three countries on an individual level in about 3000 men aged between 50 and 69 in the 1970's and about 1200 men aged between 65 to 84 years in the 1990's.

Prospective Study on Diet and Cancer
This project will be carried out in seven countries in Europe; France, Germany, Greece, Italy, The Netherlands, Spain and the UK. A total of about 400,000 people will be examined. This project will yield important information about differences in dietary intake between the participating countries and its existing relationship to cancer development.

(iv) *National Nutritional Surveys*

United Kingdom
The National Food Survey is carried out annually in about 7500 households in different regions of the UK. Data on food purchases are collected on a household basis by the housewife who keeps a log book for fourteen days.

No information is available on the intake of the different individuals in the household. Information is collected about the number of meals consumed outside but not of their composition. Further, no information is available on the consumption of alcoholic and soft drinks and sweets.

Germany
From 1985 to 1988 a large nutritional survey was conducted in the former West Germany including a representative sample of 25,000 males and females. The survey was household based.

A nutritional survey was also a part of the National Health Survey carried out in 1985, 1988 and 1991 on about 5,000 males and females.

Sweden
Since 1989 a new type of household budget survey has been carried out annually. It operates as follows.

A representative sample of 3000 persons aged between 0-74 years is selected annually.
The households to which these belong are included in the survey. A four week record on the household food purchases is kept by a person responsible for the household; this provides data on food consumption for the whole household. A precoded 7 day record of food intake is kept by the selected household member; this provides data on food consumption for the individual.

The Netherlands
In 1987 and 1988, a National Nutritional Survey was carried out in about 2500 households forming a representative sample of the Dutch population. For each member of the household, individual food consumption data were collected during two consecutive days. In total information on about 6000 persons was collected. Information on foods eaten outside the household was also collected. Another survey is planned for 1992.

Chapter Three

History of the Irish Diet

3.1: Early History

From pre-historic times to the period before the Great Famine, the Irish appear to have been well nourished. The evidence available from a) excavations and neolithic graves and b) the annals of the great monasteries up to the middle of the 18th Century, shows that the native Irish had oats, barley and some wheat as the basis of their cereal intake. Examination of teeth from human remains in excavations of Woodquay (dating from 12th/13th C.) and Tintern, Co. Wexford (16th) showed the effects of a tough abrasive diet (Power 1985). Corn was used to make coarse bread. Corn ground by millstones was probably responsible for the inclusion of sand or grit in much of the food consumed. Peridontal disease in both populations was partly caused by poor oral hygiene and a diet high in carbohydrates (e.g. oats). Recently produced archaeological data of English women from the mid-seventeenth century also showed that bone density was considerably greater than that of contemporary women of a similar age, probably in part due to their more physically active lifestyle (Lees 1993). There is no reason to believe Irish women of the same period were appreciably different. Other dental evidence suggests that weaning of children did not take place until 4 years. In modern society, weaning starts at the age of about 4-6 months. Earlier records show also that the sons of chieftains were reared on wheaten cakes and honey, whereas the ordinary person received oaten cakes and milk.

A large variety of vegetables was available to the ancient Irish. From earliest times, the use of watercress, parsley, nettles, charlock, shamrock, onions, leeks, peas, carrots, parsnips and seaweed are all widely reported. Fruits were widely available in Ireland, but with the exception of the apple, none were cultivated. Other foods available were poultry and eggs, deer and wild boar. The main sweetening agent was honey. Honey was important in early Ireland, tributes to kings and chieftains were paid in honey. Not alone was honey used in cooking but at table each person had a dish of honey into which he dipped his portion of meat, fowl, or fish (Mahon 1991).

In ancient and medieval Ireland milk and milk products, generally referred to as Ban-bhia or white 'meat' (sic) played a central role in the diet of the Irish people. These included every possible gradation of milk: fresh milk, sour milk, thick or ropy milk, buttermilk, cream, butter, curds and cheese.

Thick or ropy milk was obtained when the cream was skimmed off the pans of fresh milk, then left to set for 2-3 days in the dairy. Buttermilk, the milk left in the churn when the butter was made was considered a certain cure for a hangover and was much in demand after weddings, wakes and festivals. Curds, made by boiling sour and sweet milk together, were said to be a cure for colds, stomach upsets, and other minor ailments (Mahon 1991).

From Pre-Christian Ireland down to the end of the 18th Century cheese was a staple food. Most farmhouses had a dairy where the dairymaid or woman of the house made cheese. While in recent years Irish cheese has greatly increased in quality and composition, we still have a distance to go to equal the time when we counted among the great cheese makers of the world.

The potato was not introduced to Ireland until the 16th century. There is some evidence to support a theory that it may have appeared in the West of Ireland following the wreck of the Spanish Armada in the years 1586 and 1588. The first documentary reference to the potato in Ireland is in a lease granted in 1606 to Scottish immigrants in Co. Down, which enabled them to hold lands to grow flax and potatoes (Doyle 1975).

The potato was well established throughout Ireland by the mid-17th Century as a supplement or further type of vegetable in the varied diet of the Irish of that period. Between 1672 and 1785, the population of Ireland increased from approximately one to 3 million and was followed by a population explosion so that in 1841 the population was greater than 8 million.

From one Irish acre at this time in the late 1780s, eight and three-quarter tons of potatoes could be provided which were more than adequate to keep a man, a wife and 5 or 6 children alive for one year. During the latter part of the 18th Century, and early part of the 19th Century, the average consumption of the adult Irish was 10 lb. of potatoes and one pint of whole milk per day. The enormous quantities of potatoes consumed each day, accompanied with buttermilk, skimmed or whole milk provided the Irish labourer with not just a sufficiency of many nutrients but a super abundance of some (Crawford 1984).

The milk of the deer, of goats and of sheep have a long history in Ireland. Sheep's milk was used by those who could not afford to keep a cow in the 18th and 19th centuries and even later (Mahon 1991).

3.2: The Famine Period and Beyond

'Nineteenth century Ireland was regarded by contemporaries as one of Europe's poorest and underdeveloped regions but, unlike many present-day underdeveloped populations, the Irish were healthy and well nourished so long as their lifeline, the potato, remained secure, but when the lifeline failed, the labouring classes were exposed to all the sufferings of dietary deficiency' Margaret Crawford 1984.

The potato famine of 1845 and 1846 led to 1 and a half million deaths from starvation in Ireland, and emigration of 2 million people. During the 1850s and 1860s, Irish agriculture was relatively prosperous. Due to the marked decline in population, there was a large surplus which could be exported and the switch to grazing and dairying enabled farmers to take advantage of a sharp upward trend in the price of cattle and butter. However this state of apparent prosperity was enjoyed by relatively few. Michael Davitt founded the Land League in 1878, and thus the situation was set for the land wars leading to Gladstones Land Act in 1881 which gave the famous three 'F's" to Irish tenants- fair rents, fixity of tenure, and free sale (Doyle 1975).

During this time the land was as productive as ever and except for a disastrous harvest in 1879 there is little record of starvation and malnutrition. Considerable prosperity was apparent in the 1880s. Agricultural reform resulted in a fall in the potato acreage from over one million acres in 1870 to just over half a million acres in 1900. The diet of the general population had greatly improved. Poverty however, persisted especially in the cities. Now home-made bread (sometimes of flour, sometimes of Indian meal) and porridge and stirabout were also staple diet foods at this time. The introduction of white bread and tea to the ordinary household of the second half of the 19th century changed the diet pattern of the Irish, and homebaked wheaten bread suffered a decline. While bacon and eggs as a breakfast dish became popular with the middle classes in the latter half of the 19th century, porridge was still eaten as a first course and always given to children and servants. In addition to oatmeal porridge various corn and meal mixtures were eaten and drunk. Whole hulled wheat boiled in milk was popular, as was raw oatmeal eaten with thick milk or cream or buttermilk (Haslett 1988).

3.3: The Impact of Modern Methods of Production and Supply

The changes in dietary patterns seen in the last century correlate with changes both in agricultural production methods but also in changes in food retail and distribution. The following examples illustrate this: Importation of sugar increased from 143,000 cwt. in 1884 to 1.5 million cwt. at the beginning of the 20th Century. Dietary surveys of this period reveal that the daily adult consumption of sugar rose 10 fold between 1860 and 1900. Between 1863 and 1904, there were remarkable changes i.e. a very considerable increase in the fat component of the diet - associated in turn with increased consumption of dairy products and meats - and a decrease in carbohydrate (CHO) consumption. In the first decade of the 20th Century, more and more people throughout the rural parts of the country were beginning to have access to shop goods which were often regarded as superior to those produced at home.

3.4: The Impact of the Two World Wars

The First World War had a considerable impact on the Irish diet of the urban labouring classes in particular. Unemployment was extensive and food prices were markedly increased. By the mid 1930s, the Irish diet was however still comparatively low in fat and high in carbohydrate (Kelly 1986). The Second World War caused temporary supply problems but not fundamental changes to the Irish diet. It was the 1960's that were the years of great change. These were the years in which new foods (e.g. French, Italian, Chinese) were introduced and accepted in certain sub-groups in urban areas. Consumption of beef, pork, poultry and margarine increased (margarine by 50%), while the consumption of potatoes, bread and flour decreased. Table 3.1 below shows the per capita consumption of the principal items of foodstuffs in the Irish diet between 1961 and 1971. Note the decline in potatoes, household flour, sugar and bread, and the increase in poultry, meats, margarine and cheese.

Table 3.1 Per Capita Consumption of the 13 major food items in the Irish Diet 1961-71 in g/day.

	1961	**1964**	**1968**	**1971**
Fresh Milk	590	588	586	581
Potatoes	423	414	388	366
Bread	183	175	170	160
Household Flour	107	91	79	73
Sugar	87	74	74	72
Pigmeat	62	70	71	85
Beef	42	45	49	53
Eggs	35	34	30	29
Creamery Butter	33	36	33	34
Mutton	29	30	30	31
Poultry	14	19	26	29
Margarine	8	9	10	11
Cheese	4	5	6	7

Source: Cremin and Morrissey 1976

Per capita food supply figures, as shown for example in Food balance sheets, represents the average supply available for the population as a whole, and do not necessarily indicate what is consumed by individuals. There could be considerable variation between groups within the population as well as between individual members of these groups, however, they do give a reasonable picture of changing trends. Table 3.2 below shows the total intake of calories and nutrients for both 1961 and 1971.

Table 3.2 Intake of nutrients for 1961 and 1971

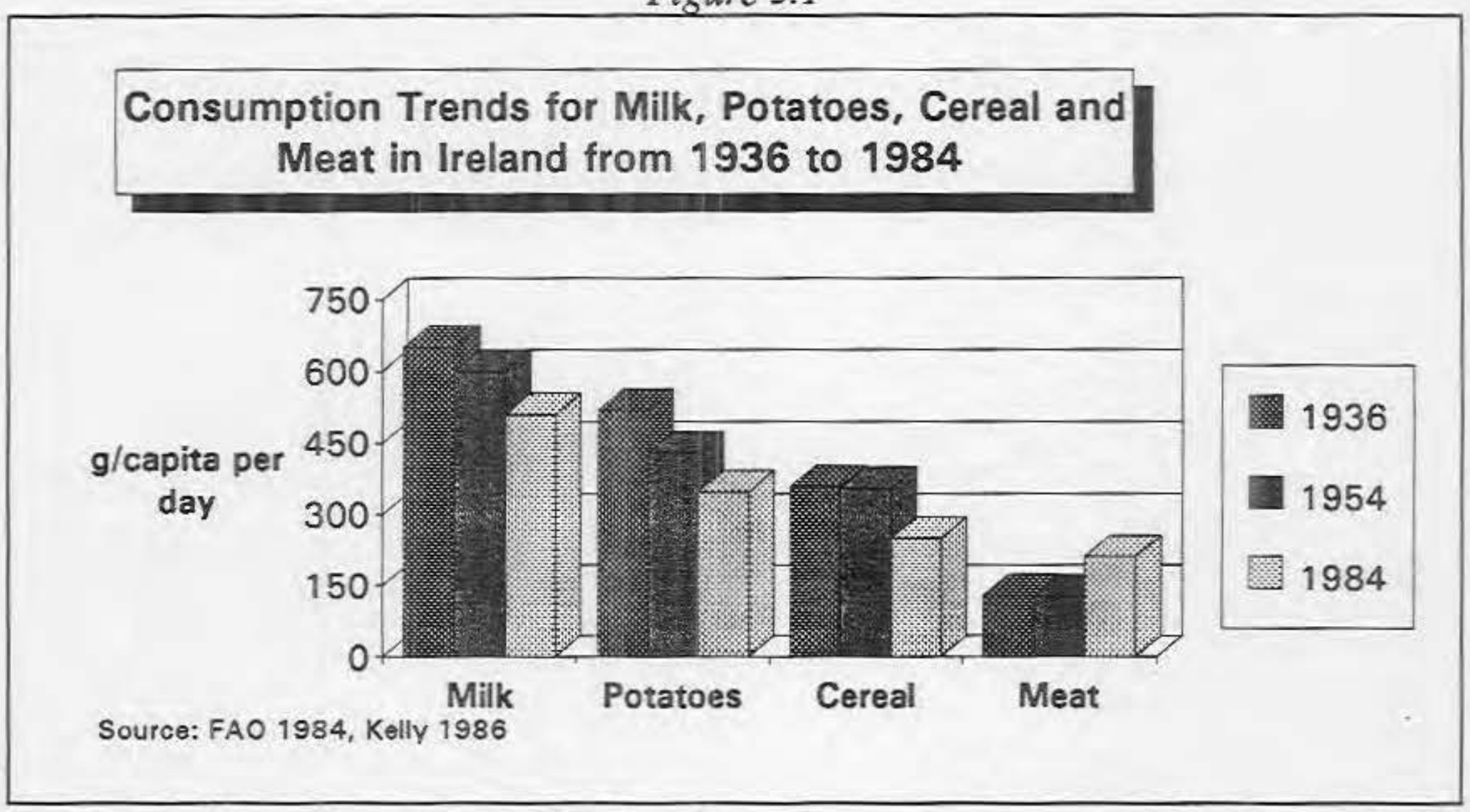
Nutrient	1961	1971
Calories	2689 Kcals	2539 Kcals
Carbohydrate	361g	300g
% Energy CHO	54%	47%
Fat	89g	97g
% Energy Fat	30%	35%
Protein	105g	110g
% Energy Protein	16%	18%
Polyunsaturated Fats	4.6g	6.1g

Source: Cremin and Morrissey 1976

There was a decrease in the total energy and carbohydrate intake and an increase in the total intake of fat, protein and polyunsaturated fats. Figure 3.1 below shows the consumption trends for milk (and milk products excluding butter), potatoes, cereals and meat between the mid-1930's and mid-1980's.

In chapter seven on dietary intake, comparisons have been made between past and present diets in Ireland.

Figure 3.1



Chapter Four

Health Status of the Irish Population

4.1: Introduction

This chapter examines the impact of diet on people's health. In many ways this is a key component of any surveillance strategy. Because this is essentially a descriptive exercise, it is not appropriate to review in exhaustive detail all of the scientific literature on which the prevailing assumptions about diet and its health impact are made. However, we know that age, sex and social class are all important socio-demographic determinants of health. Furthermore, the size of a population has an impact on the economic determinants of social stability and has a direct effect on the food chain. Finally, from a variety of epidemiological, clinical and mechanistic scientific surveys we have amassed a volume of evidence in relation to specific disease processes and diet. Epidemiological evidence tells us whether there is a pattern or relationship in the population between diet and health. For instance, there may be differences in the onset and prevalence of diseases from one country to another. Examples of this are the relationship between dietary fibre and cancer of the colon, dietary fat, coronary heart disease and cancer. This is just the first step however. Clinical evidence goes on to examine whether this relationship is also seen in individuals and whether dietary modification can reduce either the incidence of the disease itself or markers for that disease, such as for example cholesterol level in heart disease.

It is of the utmost importance to produce valid measures of dietary intake and effective means of intervention. Likewise it is important to show specifically how this food substance might be metabolised in the body and what effect this has in inducing the disease process. The weight of evidence linking a given factor is a composite of these approaches, balanced at a level of probability that makes a case for policy makers to advocate mass strategies. It is also important to note that for public health purposes there are always individuals at various levels of susceptibility in the population. Some people are at more risk than others. These so-called host factors (such as a genetic predisposition for instance) may be contrasted with environmental factors. In turn, since this is not a homogeneous world, all of the people are not uniformly eating and drinking the same thing all the time. To further complicate the issue, there are many interactions between different foods within the diet and in turn between diet and other lifestyle behaviours. Looked at in this light it is remarkable how much we have been

able to learn to date. Proof must be irrefutable if at all possible. However, unfortunately our lives are not conducted along the straight lines of the laboratory and sometimes wisdom is the capacity to distinguish between what can be proved and what should be accepted as reasonably probable. For the most part, many of the major diseases afflicting modern society are chronic in incubation, multifactorial in causation (both in genetic and environmental terms), difficult to avert and virtually impossible to completely cure.

Firstly, in this chapter it is intended to look at overall vital statistics and population life expectancy. From this a comparative picture of Ireland with other countries will be made, as well as changes over time. It is then proposed to examine patterns of major health conditions associated with diet. For the purposes of this report, we have identified a number of indicators as follows: cardiovascular diseases including heart disease and stroke, cancers of the gastro-intestinal system and breast cancer, diseases of the gastro-intestinal tract generally. Other chronic diseases, including diabetes mellitus and osteoporosis, are examined. Finally, trends in relation to children's health are considered, including height, weight and nutritional status. Eating disorders and food allergies are also included.

Table 4.1 indicates dietary factors implicated in selected disease processes. The major chronic diseases of the cardiac and cerebrovascular system are included. There is a weight of evidence linking fat intake, particularly saturated fat, with increased risk of heart disease. In turn, fish consumption, particularly oily fish, is associated with a reduction in risk. A u-shaped relationship exists between alcohol and mortality, so that those consuming modest regular amounts are at less risk than teetotallers. Heart disease is also associated with obesity, possibly related to diet generally and raised blood pressure is certainly associated with population salt intake.

Table 4.1 Possible Dietary Factors in Selected Implicated Diseases

Conditions	**International Classification of Diseases:9**	**Dietary Factors**
Coronary Heart Disease	440	Fat, Salt
Stroke	434	Salt, Alcohol
Diabetes	250	Excess Energy Intake
Obesity	278	Excess Energy Intake
Cancer of the Breast	174	Fat, Fibre, Alcohol
Cancer of the Colon	153	Fibre
Cancer of the Rectum	154	Fibre
Cancer of the Stomach	151	Nitrites/ Nitrosamines
Diverticular Disease	562	Fibre
Crohns Disease	564	Fibre
Ulcerative Colitis	569	Lactose
Constipation	-	Fibre
Peptic Ulcer	533	Irregular meal patterns, Alcohol
Liver Cirrhosis	571	Alcohol
Gallstones	574	Fat
Osteoporosis	-	Calcium/ Vitamin D deficiency
Phenylketonuria	-	Phenylalanine
Dental Caries	523	Sugar, Fluoride
Thyroid (Goitre)	240	Iodine deficiency
Coeliac Disease	-	Gluten
Iron Deficiency Anaemia	280	Iron
Folate Deficiency Anaemia	281	Folate

Source: NNSC 1993

Several of the common cancers of the digestive tract are associated with fibre intake. Cancer of the stomach has been declining throughout this century in developed and Western countries, whereas it remains relatively common in oriental countries and is associated with nitrosamines in the diet. We also include on this list a variety of other common complaints of the gastro-intestinal system and a number of common deficiency states ranging from the various anaemias to metabolic disorders such as phenylketonuria. Dental disease is also included. It is quite possible to write an exhaustive report on each of these issues and indeed on a variety of others. However we will focus on some of them here to emphasise the range of data available, or indeed not available.

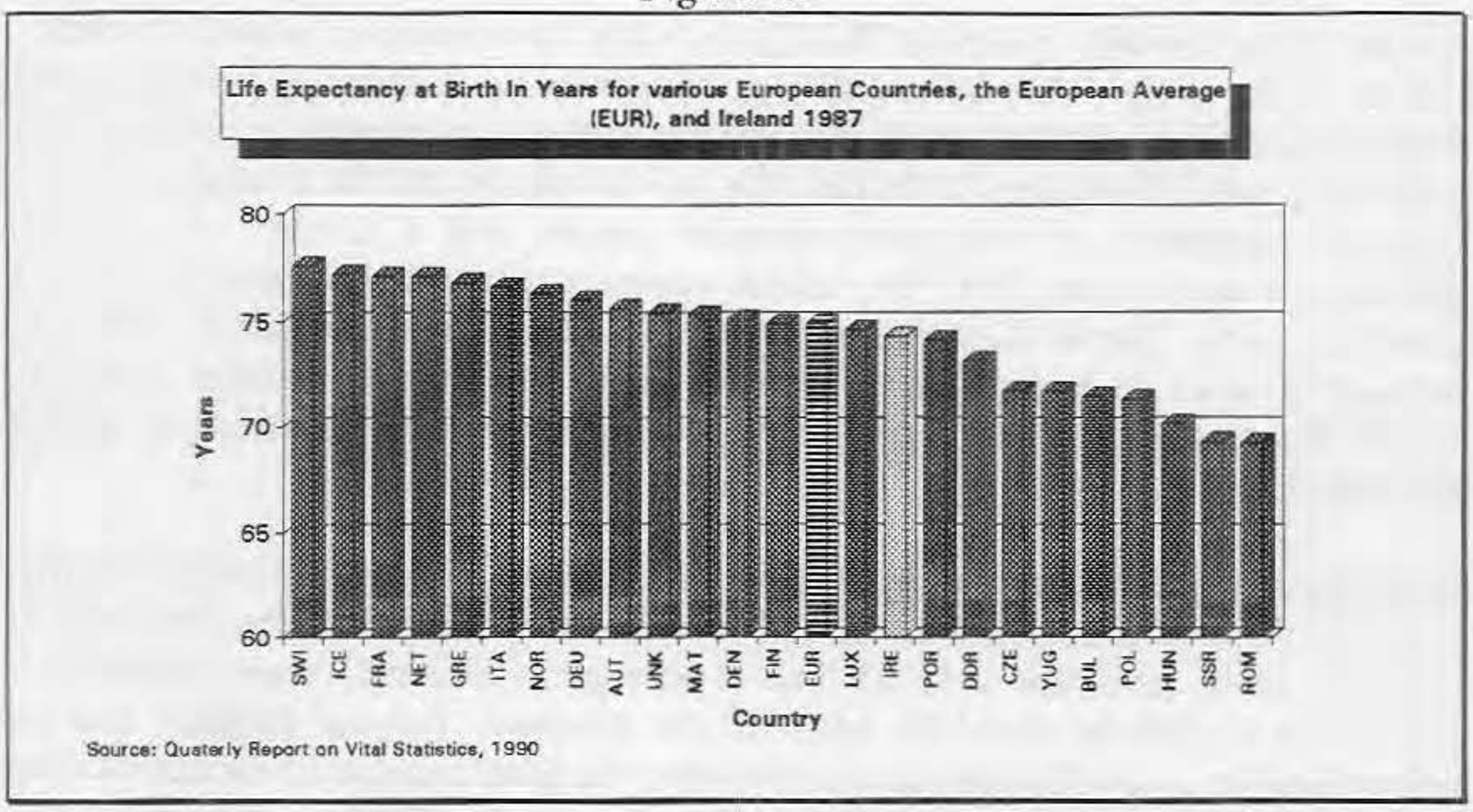
Some general points need to be made about the standard of that available data. Firstly, mortality data are routinely recorded and collated but are subject to the drawback of adequate death certification. At the time of writing the National Tumour Registry is just being established from the basis of the Southern Tumour Registry and so comprehensive morbidity data are not available. We have received co-operation from the Department of Health, the Health Boards and the ESRI among others, in assembling morbidity data but this remains a complex and not yet adequate data source. There are few disease specific dedicated databases on common conditions like diabetes mellitus. The sentinel practice network in General Practice is at an early stage of development. It is to be hoped that in future reports we can bridge the gaps in data available to us more fully. We are relying largely on published reports so the most recent year cited may vary and is a function of the gap between data collection and publication.

4.2: Vital Statistics

4.2.1: Life Expectancy

Irish women had the lowest overall life expectancy in the EC and males are ranked fourth in 1987. Life expectancy, as a measure, is a good indicator of the health status of a population, affording an overall picture of the health of a nation. Figure 4.1 illustrates life expectancy from birth in selected European countries, including our EC partners. While this has improved to mean longevity for most Europeans, there are distinct differences still between countries. From this figure Ireland is shown to be below average with a life expectancy at birth for all of 74.3 years.

Figure 4.1



In absolute terms women do live longer than men (average of 5.6 years in 1988 (Table 4.2) and it is true that even at retirement age most Irish people can expect to live at least a decade longer. However, life expectancy for men at the age of 60 is no better now than in the 1920s (ESRI 1993). The quality of that life and the health status in old age are of concern to us, particularly in this European Year of Older People (Kelleher 1993).

Table 4.2. Average Life expectency in years at selected ages for the Irish Population (1988)

Age	Life Expectancy (Males)	Life Expectancy (Females)
0	71.1	76.7
1	70.7	76.3
40	33.1	38.1
65	12.6	16.2

Source: Health Statistics, Dept. of Health 1991.

4.2.2. The Current Irish Population

The population of Ireland has increased from 2.8 million in the 1960s to over 3.5 million in 1992 (Table 4.3). However, that rate of increase has now effectively halted, even showing a decrease of 0.5% over the five year period between 1981 and 1986. This is due both to declining birth rates and a return to high levels of emigration, in itself a consequence of unemployment.

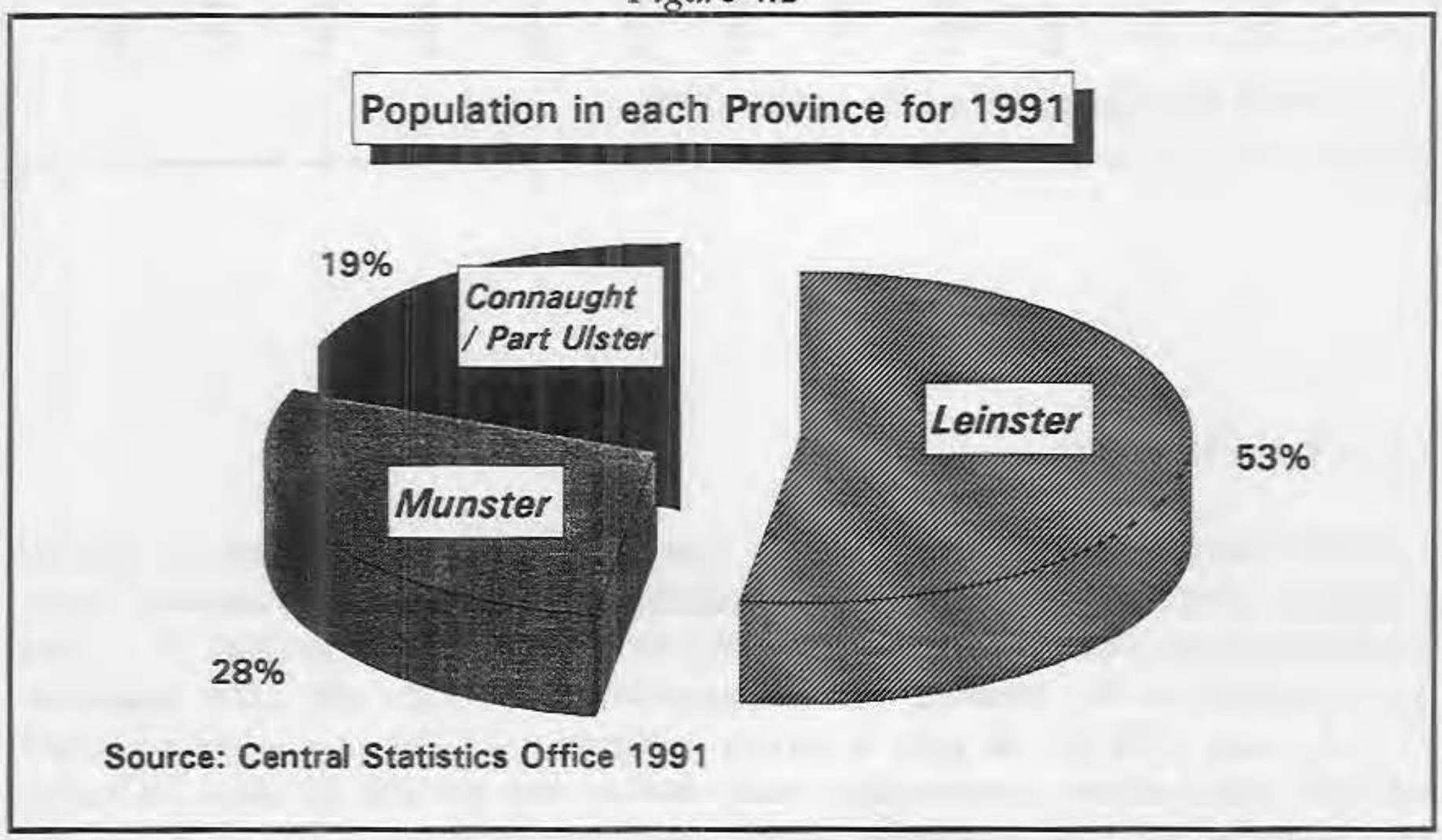
Table 4.3 Population, Age groups and Density in Ireland for selected years since 1966.

	1966	1971	1979	1981	1986
Total Population	2,884,002	2,978,248	3,368,317	3,443,405	3,540,643
Age Groups (%):					
0-14	31.2	31.3	30.6	30.3	28.9
15-64	57.6	57.7	58.7	59.0	60.2
65 and over	11.2	11.1	10.7	10.7	10.9
75 and over	4.1	4.0	3.8	3.8	4.1
Density:					
Number of persons per square kilometre	41	42	48	49	50

Source: Health Statistics, Dept. of Health 1990.

It is estimated that emigration is now running at 27,000 per annum. These factors will naturally affect not only trends in the population, but also health status and the age and demographic structure in the country. The population figure for 1991 stands at 3,523,401 with a province distribution as shown below: in Figure 4.2. It can be seen that the majority of the population is on the Eastern seaboard. Further, population projections predict a continuation of this trend.

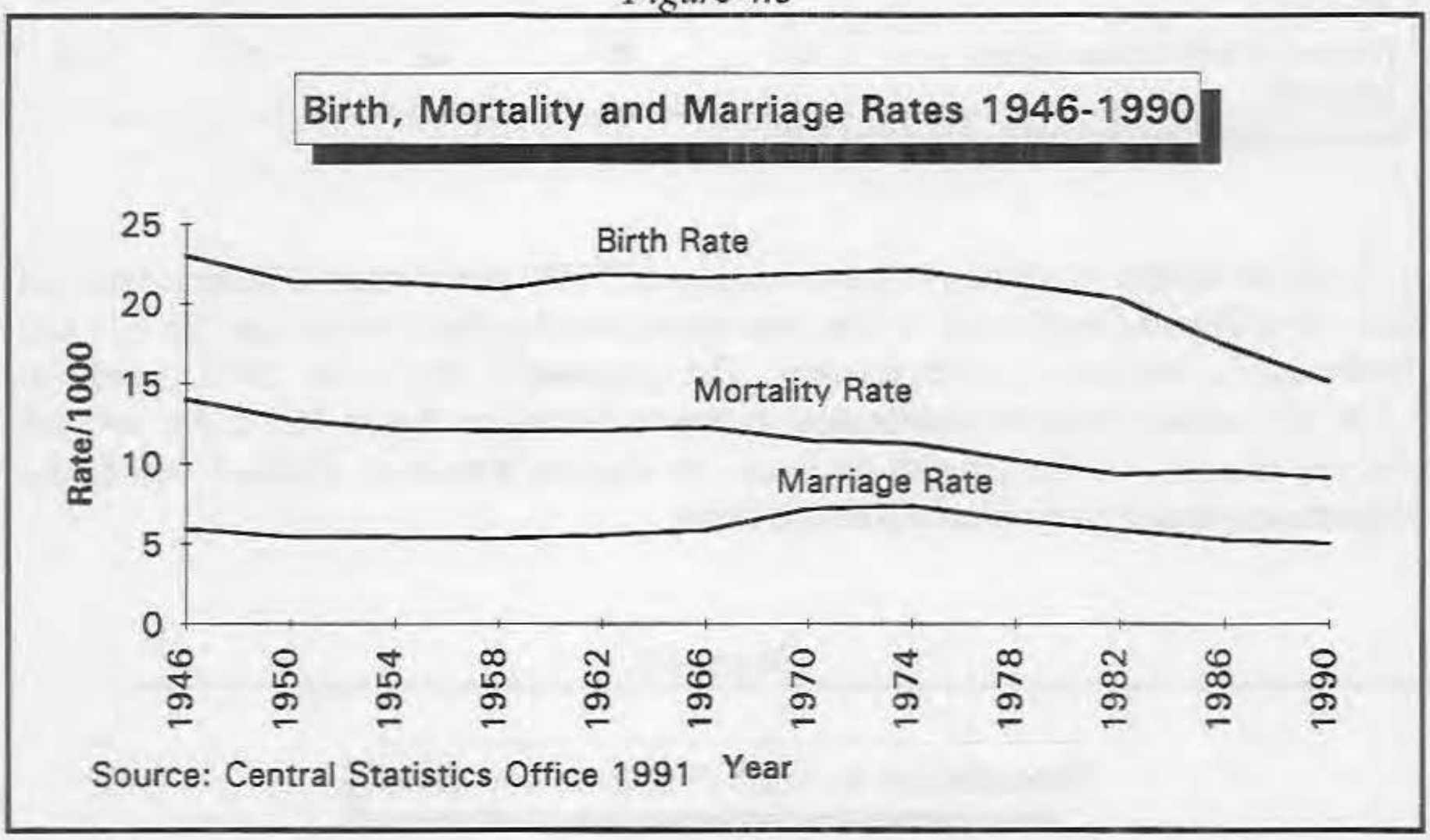
Figure 4.2



In common with most developed countries, increasing life expectancy implies a growth in both the relative and absolute numbers of old people. However, we have had a high birth rate historically which contributed to the large proportion of young people (table 4.3). Birth rates in Ireland are declining but are still exceptionally high by European

standards. The trends in figure 4.3 since the second world war exhibit this decrease and this trend is expected to continue over the next 20 years but at a more moderate decline. It can therefore be seen that Ireland has unique factors tending to control absolute numbers of the population. We have a relatively large number of young people but in common with most developed countries an expanding elderly population, especially on the eastern sea board.

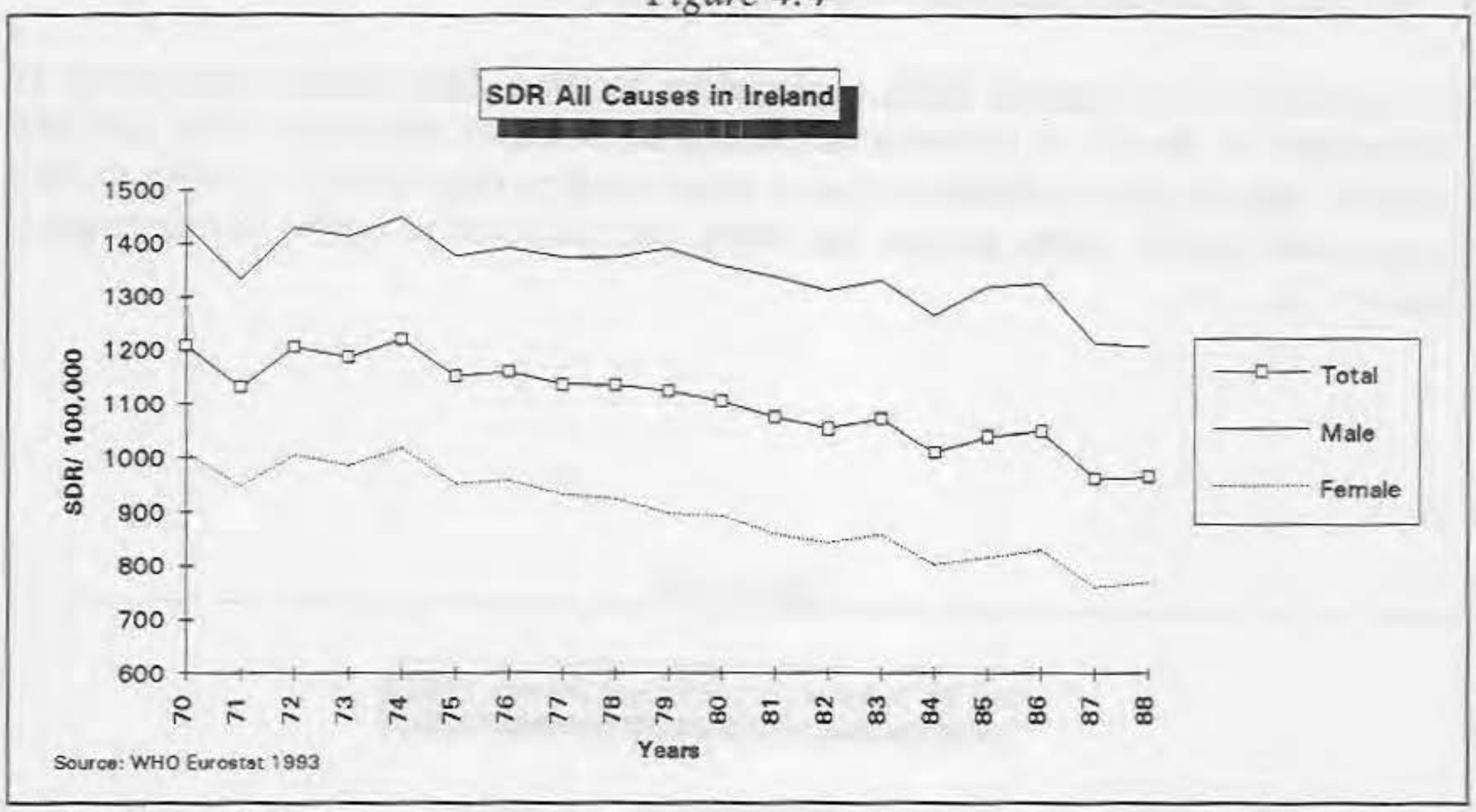
Figure 4.3



4.2.3: Total Mortality

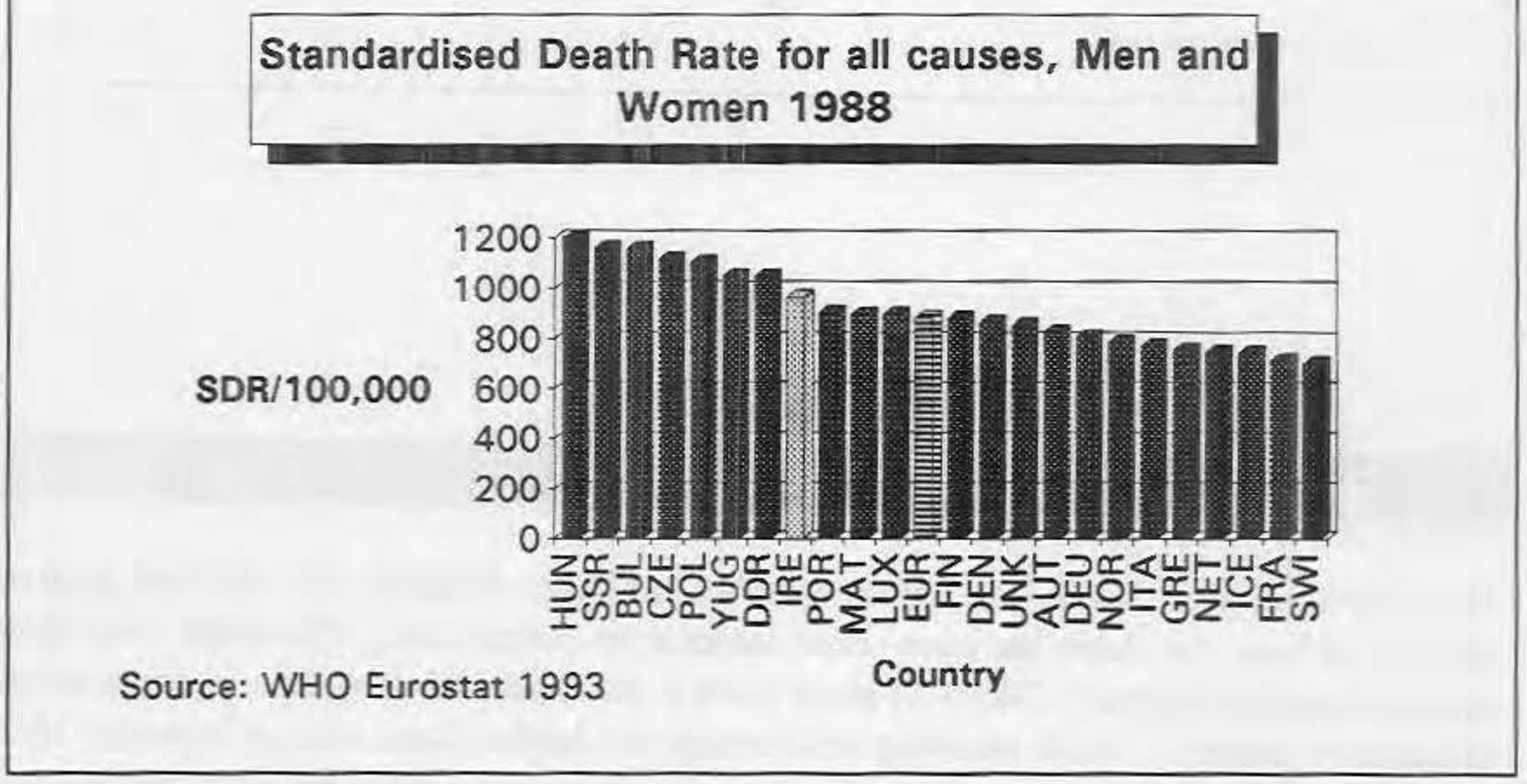
To best describe the health status of the Irish population it is necessary to start by looking at trends in both mortality and morbidity. Mortality is usually reported using the Standardised Death Rate (SDR) whereby death rates are standardised to a given world population, thus enabling direct comparisons to be made with other countries. The all cause SDR for all ages is shown in Figure 4.4. This is a relatively crude indicator, but it shows a reasonably steady decline over the last 18 years, reflecting increasing longevity. SDR is also relatively lower in women .

Figure 4.4



When we compare this with a selection of other European countries however, we find that Ireland has a higher rate than all EC countries and is ranked only above Eastern European countries. Ireland is shown to have a higher SDR than the European average (EUR) with France and Switzerland having the lowest (Figure 4.5).

Figure 4.5

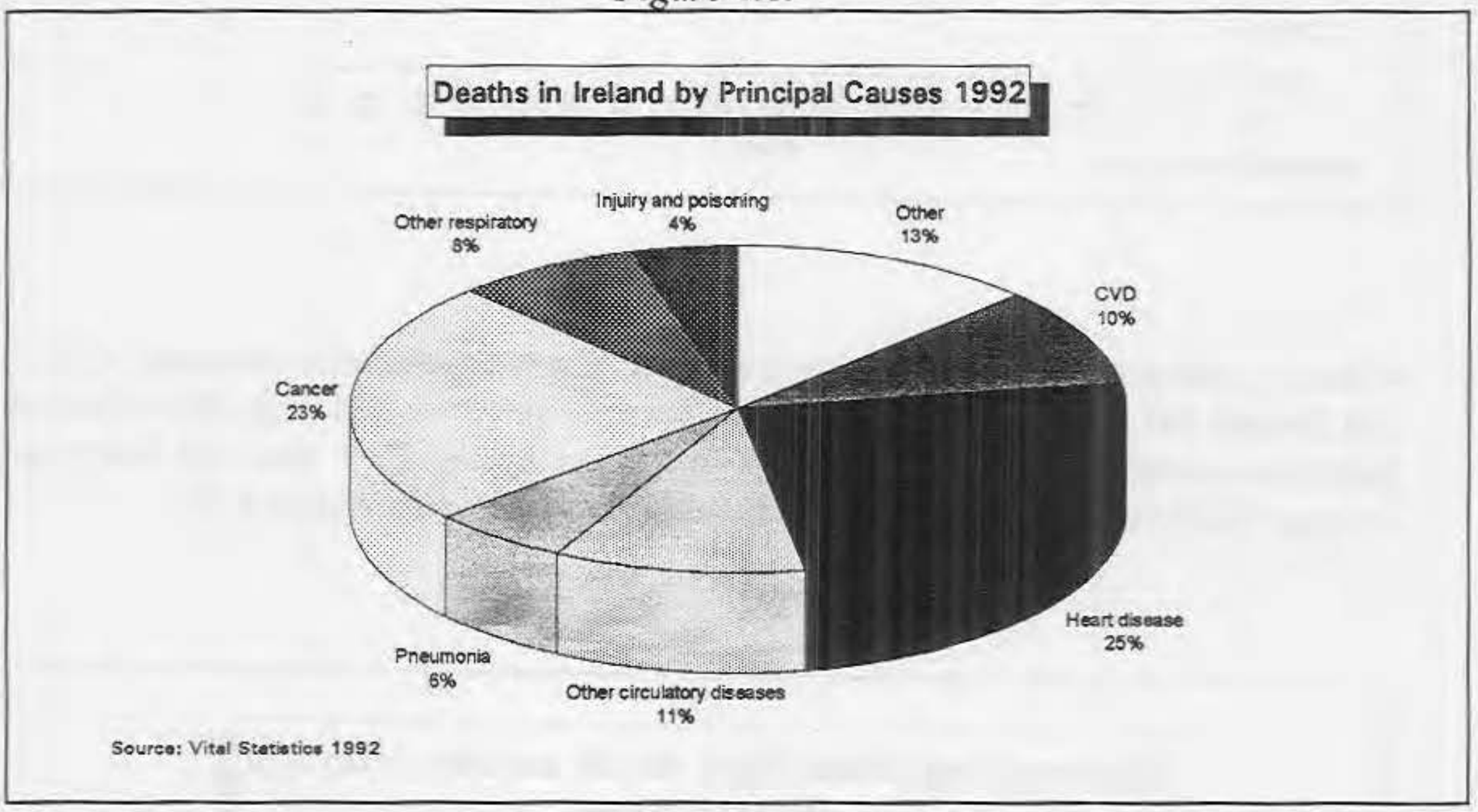


In summary, while the overall death rate in Ireland is decreasing, as shown in Figure 4.4, this gradient is lower than some of our European counterparts. This is illustrated

in another way by the standardised death rate, which is higher than the European average and higher than most of our EC counterparts.

The next step is to examine likely explanations for this. This low life expectancy in comparison to the EC is primarily attributed to mortality associated with Ireland's relatively high incidence of cardiovascular disease and certain cancers. Cardiovascular diseases and cancers alone account for nearly two thirds of all deaths in this country (Figure 4.6).

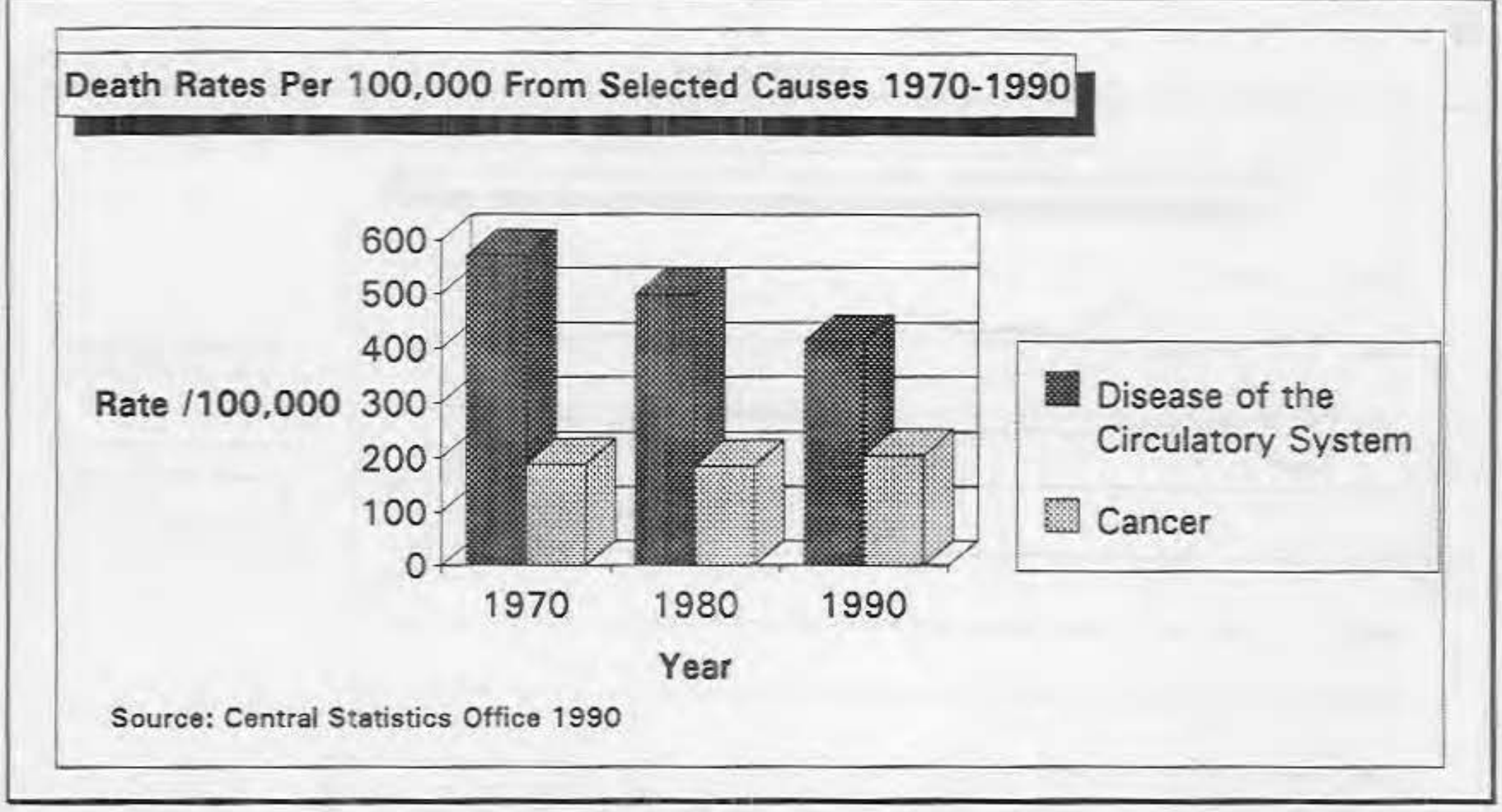
Figure 4.6.



4.3: Contributors to Mortality

In many countries worldwide, heart disease has been declining for the last quarter century at least but there has been some increase in cancer rates. The death rates from selected causes (Figure 4.7 below) show such a decrease in deaths from disease of the circulatory system, while showing an increase in deaths from cancer between 1970 and 1990. These figures bear some further examination. In the following sections we examine disease specific patterns further.

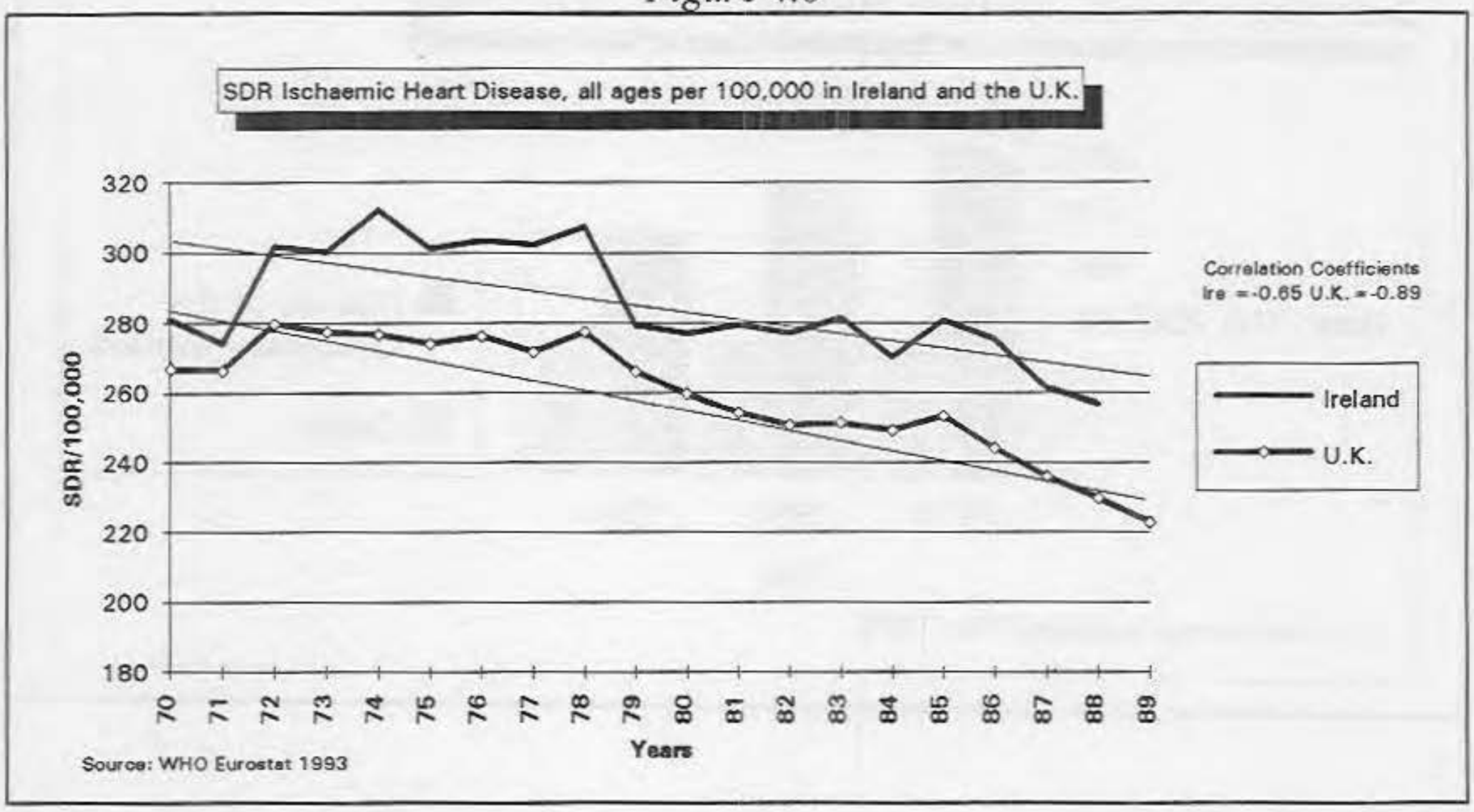
Figure 4.7



4.3.1: Cardiovascular Disease

The two main causes of vascular disease-related deaths are ischaemic heart disease and cerebrovascular disease, including stroke. Heart disease in itself is responsible for 26.5% of deaths. Irish men were estimated in the mid eighties (Dean and Kelson, 1984) to have a risk of ischaemic heart disease of about 50% above the average for men generally in the EC countries, while Irish women have more than twice the risk (200% increase) of dying from this disease than women in the EC generally. The standardised death rate (SDR) for ischaemic heart disease for both Irish males and females is shown to be declining in the period 1970-1988. The rate of decline is however less marked than in other countries in the United Kingdom (Figure 4.8) and overall rates continue to be higher than in the United Kingdom as a whole.

Figure 4.8



Deaths in Ireland and Northern Ireland still remain the highest in the EC, as demonstrated in this map of Europe, which also demonstrates the Mediterranean phenomenon of relatively reduced rates of heart disease (Figure 4.9). Cerebrovascular disease (CV) or stroke accounted for 9% of all Irish deaths in 1990. The SDR for this condition in Ireland is shown to be decreasing sharply since the 70s, more markedly even than in the United Kingdom (Figure 4.10). This finding is also consistent with that in other countries. Possible explanations for these trends will be explored further in the section on risk factor measurements.

Figure 4.9

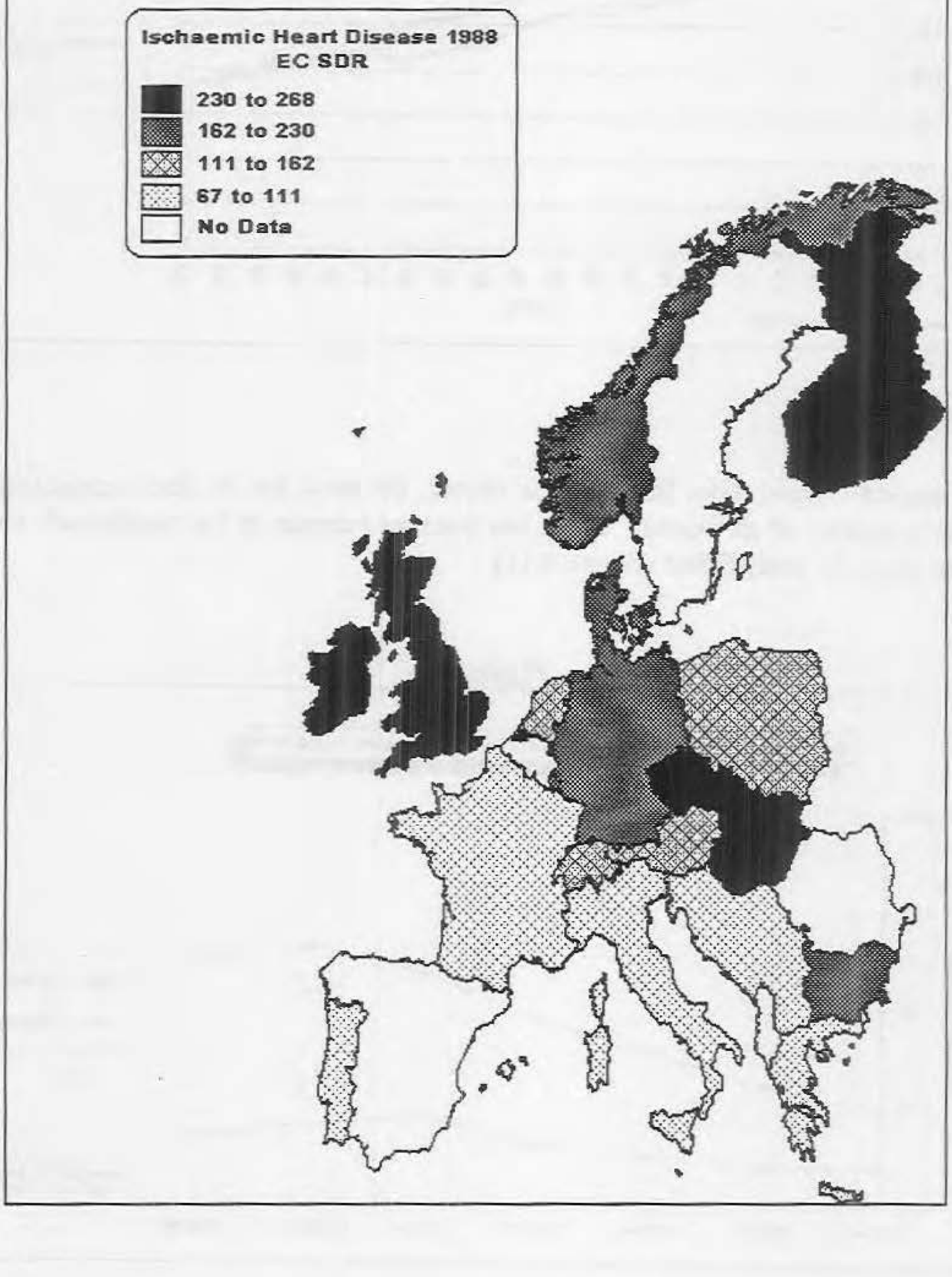
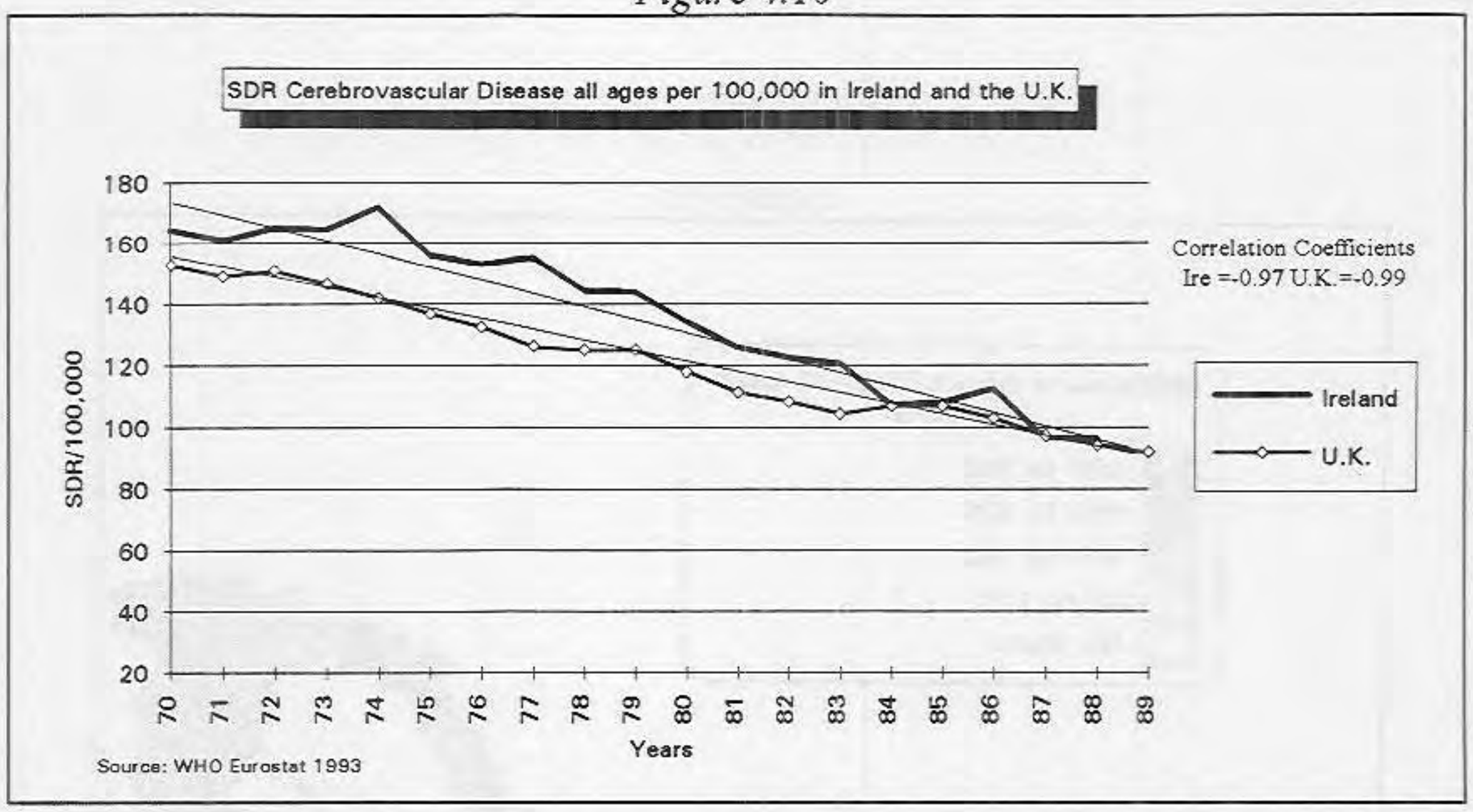

Ischaemic Heart Disease 1988
EC SDR
230 to 268
162 to 230
111 to 162
67 to 111
No Data

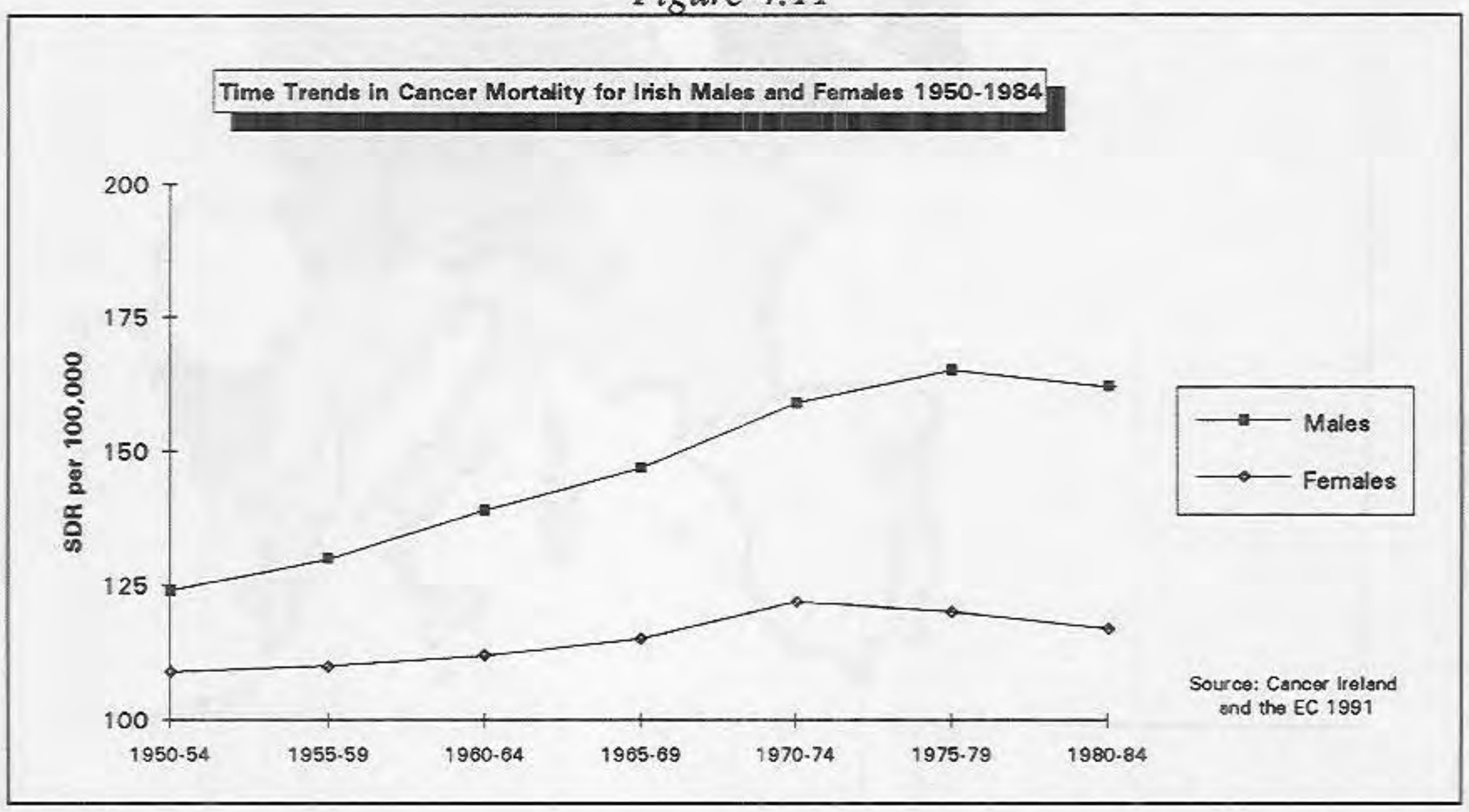
Figure 4.10



4.3.2: Cancers

The second biggest killer in Ireland is cancer, the total for all sites accounting for nearly a quarter of all deaths. There has been an increase in the number of cancer deaths since the early Fifties (Figure 4.11).

Figure 4.11



The most common cancers in both sexes are sited in the lung, large bowel and stomach, cancer of the breast being the most common sex specific tumour in women

and cancer of the prostate in men. The trend in mortality for males and females of cancer and the actual percent of all deaths by cancer type are shown below. Figure 4.12 refers to men in 1992 and Figure 4.13 to women.

Figure 4.12

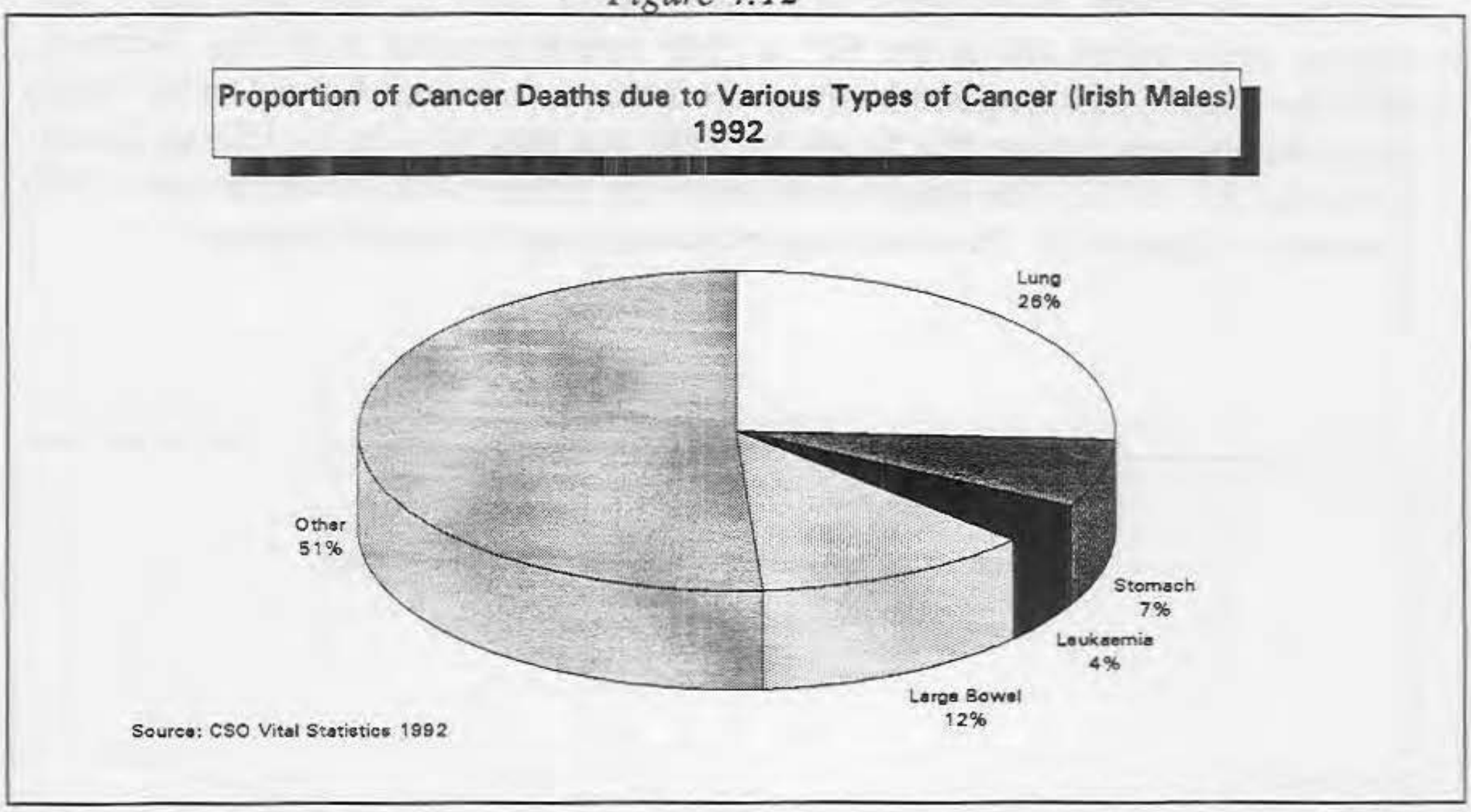
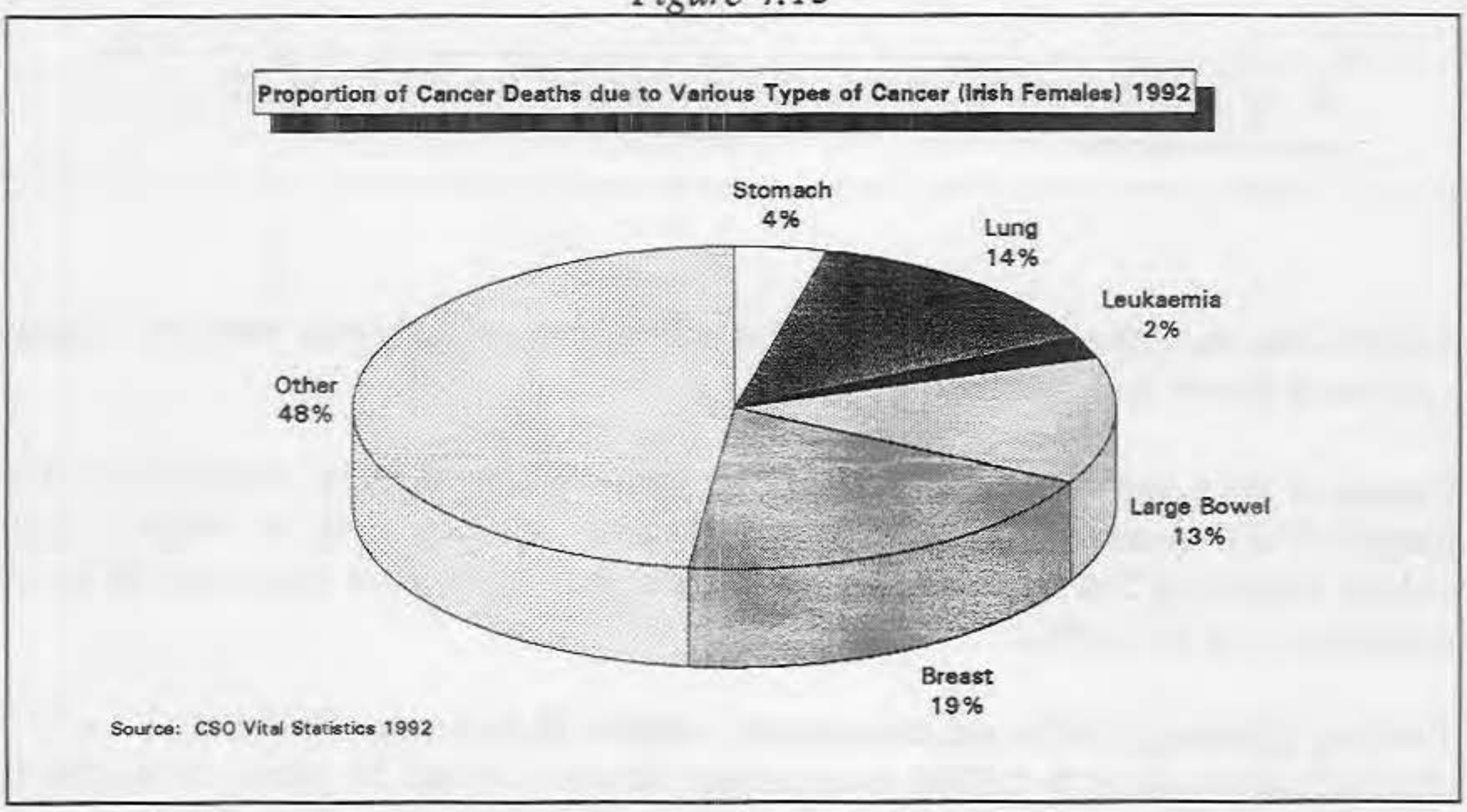


Figure 4.13

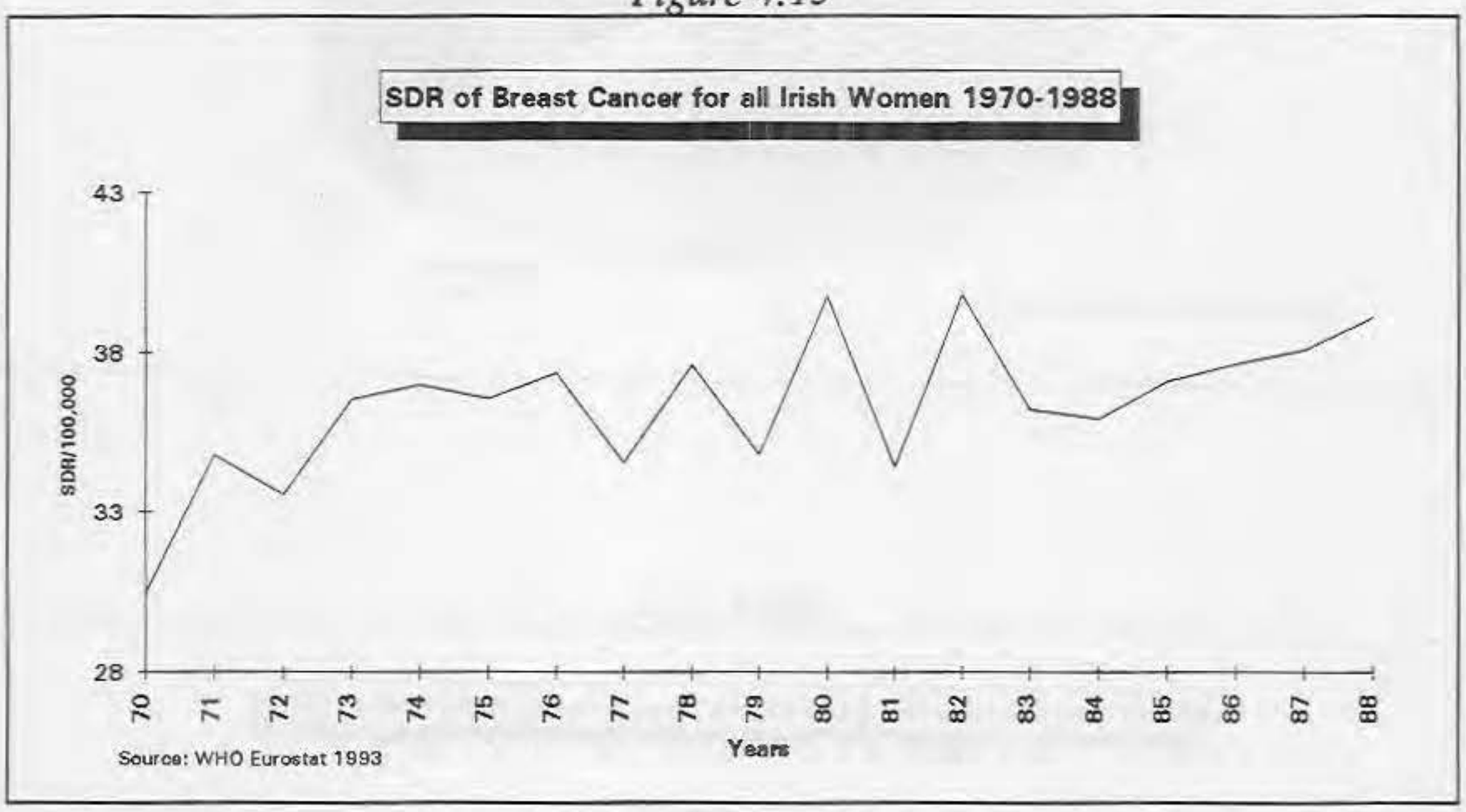


Cancers of the breast, lung and digestive tract account for over half of all cancer-related deaths in women; all other neoplasms, including leukaemias and lymphomas, cancers of skin, genito urinary tract together constituting the remainder (Figure 4.14).

4.3.3: Breast Cancer

Breast cancer is the leading cause of cancer deaths in women in Ireland, accounting for nearly 20% of all such deaths. It is the leading cause of death in women of under 55 years of age. It is, however mainly a disease of older women with 60% of deaths occurring in women of 60 years and older and the rates increase with age. Irish women were ranked 6th in the EC in 1988 behind England & Wales, Denmark, Northern Ireland, Scotland and Belgium. In 1960, Irish women had a 1 in 20 chance of developing this cancer; the figure for 1990 has risen to 1 in 11 (Breast Cancer Research Unit, UCG). The standardised death rate (SDR) for Irish women since 1970 is shown in Figure 4.15. This does demonstrate a gradual but steady increase.

Figure 4.15



4.3.4: Cancers of the Digestive Tract (including oral, oesophagus, stomach , large and small bowel and rectum)

Cancer of the bowel is most common in western affluent societies, the highest rates found in North America, Northern Europe, Australia and New Zealand. Ireland ranks 3rd for males and 2nd for females in the EC for death rates from this cancer (Cancer Ireland and the EC 1991).

The two following studies are examples of research in this area. Willet et al. studied diet and colon cancer in 89,000 women aged between 34 and 59 years, documenting 150 cases of colon cancer. They showed a clinically and statistically significant increase in cancer related to ingestion to total fat, saturated fatty acids and red meat. The ingestion of vegetable fat was shown not to be significantly correlated with that of colon cancer. Finally, there was a negative correlation between the amount of chicken and fish ingested and the incidence of colon cancer in women.

The relationship between colon cancer deaths in men and fat consumption was studied by Carroll (1975). The relationship was shown to be very positive and a highly correlated one. Those countries whose population consumes >120g of fat per day, i.e., Austria, Sweden, Australia, France the United States, New Zealand and Canada, all had very high death rates from colon cancer. In countries such as Thailand, El Salvador and Columbia, where fat consumption is quite minimal, i.e., <50g per day, the incidence of deaths from colon cancer is extremely low. While these studys confirm an associative rather than necessarily a causal relationship, there is other good mechanistic evidence to suport the realtionship.

The aetiological factors involved in various cancers of the digestive tract are various however. Stomach cancer for instance has been shown to be decreasing in most western populations, with Ireland lying 7th for men, and 5th for women in the EC (Cancer, Ireland and the EC 1991). It is primarily a disease of the elderly with over 80% of deaths occurring in the 60+ age group. The male:female ratio in this country is in the region of 1.5:1.

4.3.5: Other Measures of Mortality: Years of Potential Life Lost

Measures of mortality, while relatively robust indicators for change are not necessarily very illuminating when we attempt to measure the more general impact of ill health on a society, or the scale involved. If we accept the general reasoning in relation to aetiology of various conditions, it follows that a substantial reduction in mortality in specific diseases e.g. circulatory diseases and cancers, could be achieved with significant alteration in lifestyles, supported by necessary social changes. This may be expressed not just in terms of reduction in mortality, but also by relating the loss of life to the age at which it occurs on average. On this basis, an infant who dies prematurely loses over 70 years of potential life. In this way the human impact of ill-health can be gauged. In the case of both males and females in Ireland, unintentional injuries are the leading cause of Years of Potential Life Lost (YPLL) for people under 35. Heart disease and malignant neoplasms are mainly responsible for YPLL for people over this age. The percentage change in crude mortality (Figure 4.16) and YPLL from 1980 to 1988 is shown below (figure 4.17).

Figure 4.16

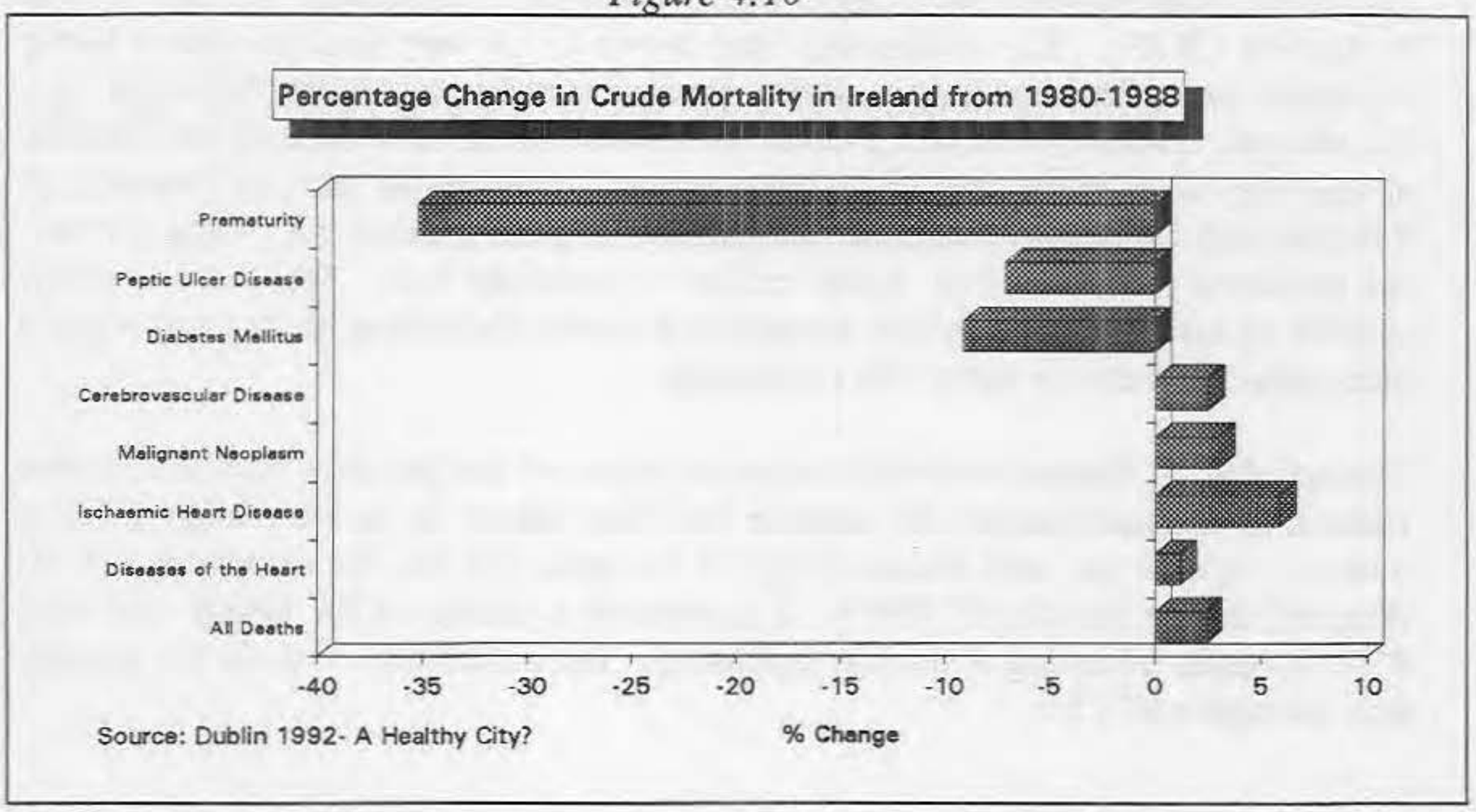
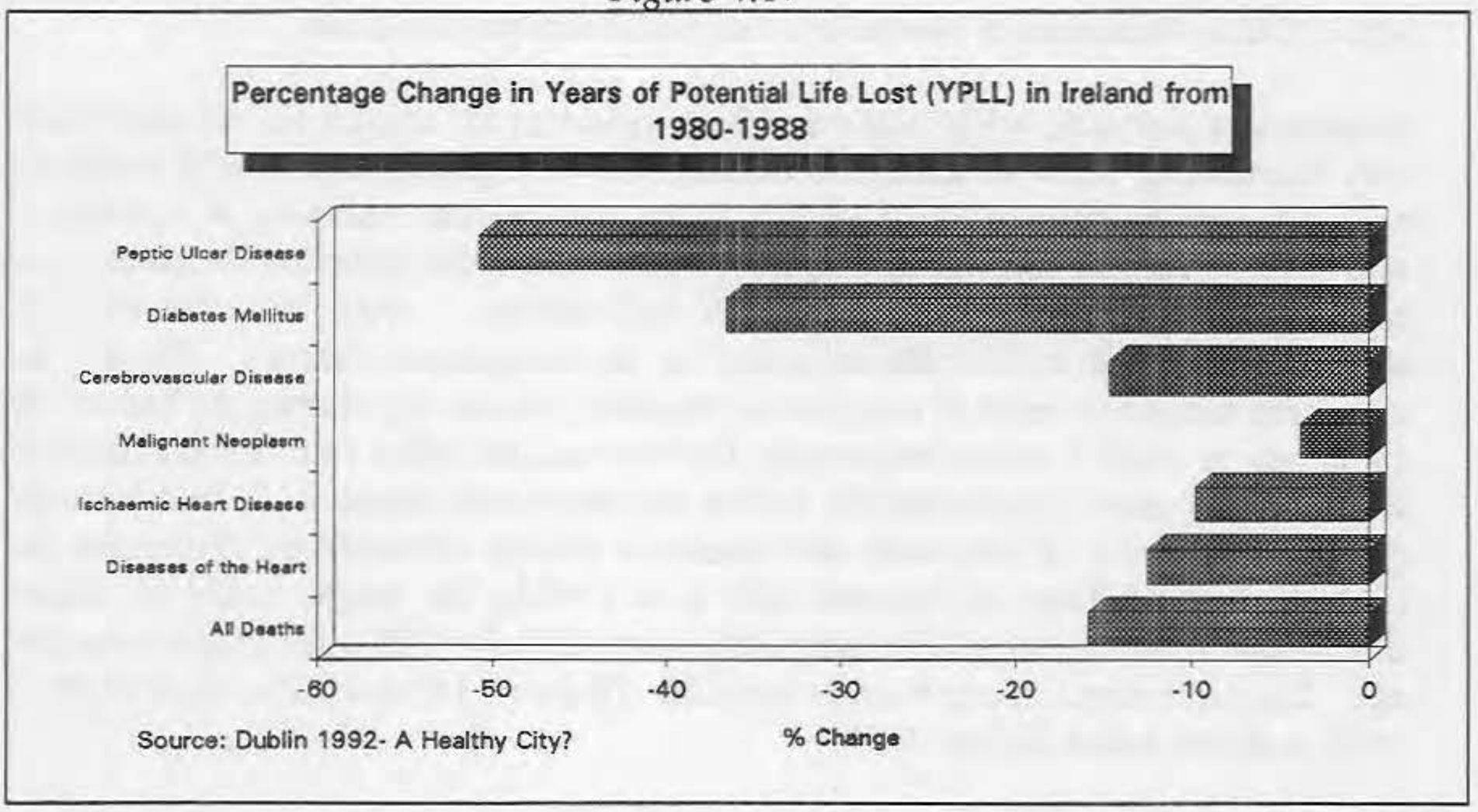


Figure 4.17



From this perspective it can be seen that many diseases of early childhood and adulthood have shown distinct decreases, (as for instance peptic ulcer disease) and conditions associated with ageing, like cancer, are increasing in incidence. Presumably, gains in prognosis in conditions like leukaemia are reflected in the reduction in YPPL.

4.4: Morbidity

4.4.1: Indicators

Mortality data are readily available indicators of health status. However, not all diseases are fatal and indeed many may be chronic and debilitating in their course. Morbidity (or illness) data are therefore an essential secondary indicator. Morbidity can be defined as illness experience or alternatively as the study of the incidence (new cases) and prevalence (existing cases) of a disease. There are numerous problems with the collection of morbidity data. These include lack of standardisation (differing ways or reporting the same condition by different doctors, or hospitals or even countries), validity (a true measure of the condition in question), reliability (the same diagnosis consistently made) and under reporting. In Ireland we have no comprehensive patient registration system. About one third of the population are entitled to all medical services free and are registered with the general medical services. There are three main data sources, from the hospital sector, from general practice or alternatively through voluntary insurance networks, the principal one being the Voluntary Health Insurance scheme.. Hospital admission data are now usually classified using a diagnostic group system. These are a way of grouping individual medical conditions classified according to a standardised system.

In this report, we refer for morbidity data mainly to existing surveillance related to the hospital service primarily and to occasional survey data collected primarily for research. The ICGP Sentinel Practice Network report (Comber 1991) is currently confined to a small number of mainly infectious conditions. Data from the Kilkenny Health Project are also considered in more detail under the section on risk factors. The two primary data sources for acute hospital admissions are the Hospital In-Patient Enquiry Scheme (HIPE) and the Perinatal Reporting System (PRS) for all births. The Economic and Social Research Institute (ESRI) analyses data merged from the two schemes for a more comprehensive study of acute hospital activity.

The HIPE, established in 1972 by the Medico-Social Research Board, has been run by the Department of Health since 1989. Hospital discharge data are collected and a database of demographic and diagnostic data are maintained. According to a Department of Health estimate in 1992, the HIPE database now covers approximately 55% of public hospitals. The figure for 1986 was 84% and 62% in 1989. These fluctuations in participation rates are apparently primarily due to budget constraints and problems encountered in adapting the system to include ICD classifications. However, the HIPE is a valuable source of information on the morbidity related to acute discharges from public hospitals and will become increasingly useful as the system adjustments are made. Although it cannot provide us with comprehensive figures, unless there are systematic reasons why hospitals fail to participate each year (i.e. a hospital with a high rate of heart disease decides to make returns only in low incidence years) then trends from year to year should be reasonably reliable.

The PRS has been in operation since 1981 under the Dept. of Health with almost 100% coverage. The system seeks to provide national statistical tables on perinatal events and more specifically to describe the fundamental social and biological characteristics of mothers and their babies. (Department of Health, Perinatal Statistics 1984, 1987). Morbidity data of the mother and baby are collected as well as information about the hospital stay, method of delivery and demographic characteristics.

Table 4.4 presents summary data for consecutive years 1988 and 1989. A comparison of diagnoses reveal little, if any, trend for change. Unfortunately, the categories are rather general for the purposes of this report and reveal only systems potentially associated with dietary factors. The HIPE data for 1991 is the most up to date available and consists of 328,736 records out of an estimate of 532,115 i.e. about 62% national coverage. Select disorders, by sex, expressed as a total of all recorded are shown in Table 4.5. Care must be taken in interpreting these figures for the reasons outlined above.

Table 4.4 Hospital Inpatient Inquiry Data: Selected Diagnostic Categories related to Diet by Year

Diagnosis	**Percentage**	
	1988	**1989**
Digestive System	**11.8**	**11.9**
Circulatory System	**10.1**	**10.5**
Neoplasms	**7.0**	**7.5**
Endocrine, Nutritional and Metabolic	**2.1**	**2.1**

Source: Health Statistics 1990, Dept. of Health

Table 4.5 Hospital Inpatient Inquiry Data: Selected Diagnostic Categories and percentages from 1991 HIPE Data (note these figures are 62% of potential National Coverage).

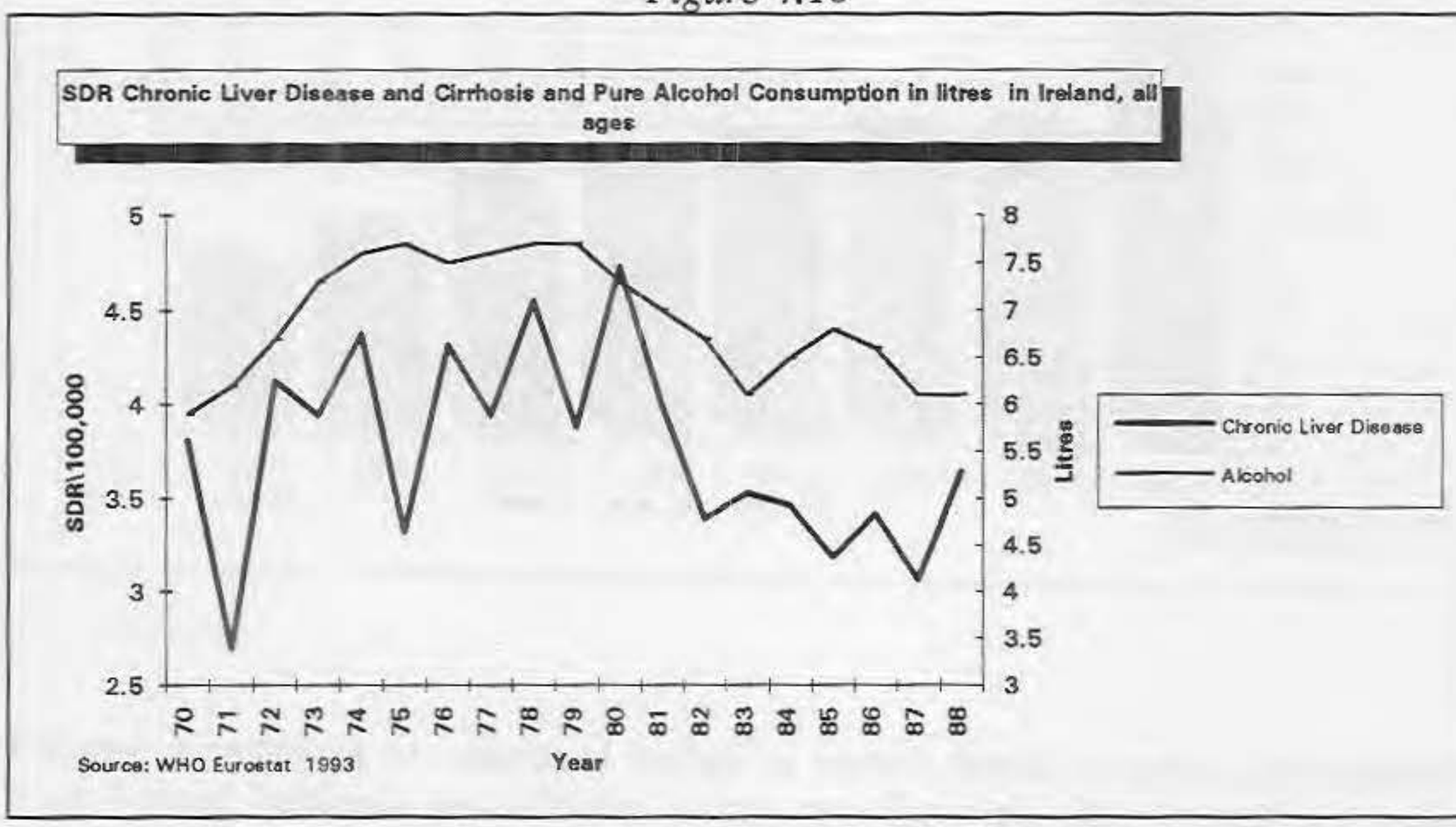
Disorder	**No. of Cases Male**	**%**	**No. of Cases Female**	**%**
Malignant Neoplasms	5779	3.4	4452	2.8
Diabetes Mellitus	1477	0.9	1384	0.9
Nutritional Deficiencies	31	0.0	42	0.0
Diseases of the Circulatory System	11243	6.7	7891	4.9
Hypertensive Disorders	677	0.4	755	0.5
Acute Myocardial Infraction	2677	1.6	1448	0.9
Cerebrovascular Disease	2286	1.4	2124	1.3
Diseases of the Teeth and Supporting Structures	1039	0.6	1130	0.7
Total	19430	11.5	14774	9.2

Source: ESRI 1993

4.4.2: Chronic Liver Disease and Cirrhosis

Standardised deaths rates from liver disease and cirrhosis in Ireland have been declining since the seventies. The SDR/100,000 in 1970 was 3.81 which has fallen to 3.64 in 1988. Hungary, Portugal and Italy have the highest death rates for this disorder in 1988 with Ireland and Iceland having the lowest. An interesting comparison is to compare pure alcohol consumption and deaths from this disorder over time (Figure 4.18). This shows that there was a relative rise in standardised death rates during the 1970s which has since declined. Pure alcohol consumption peaked during the same time period and has declined since. However, these data must certainly be interpreted with caution, since the temporal relationship between cirrhosis and alcohol is a very long one on an individual clinical basis and secondly the estimates of alcohol consumption are based on retail figures rather than any population study. In general however, cirrhosis does demonstrate this kind of relationship with population alcohol consumption..

Figure 4.18



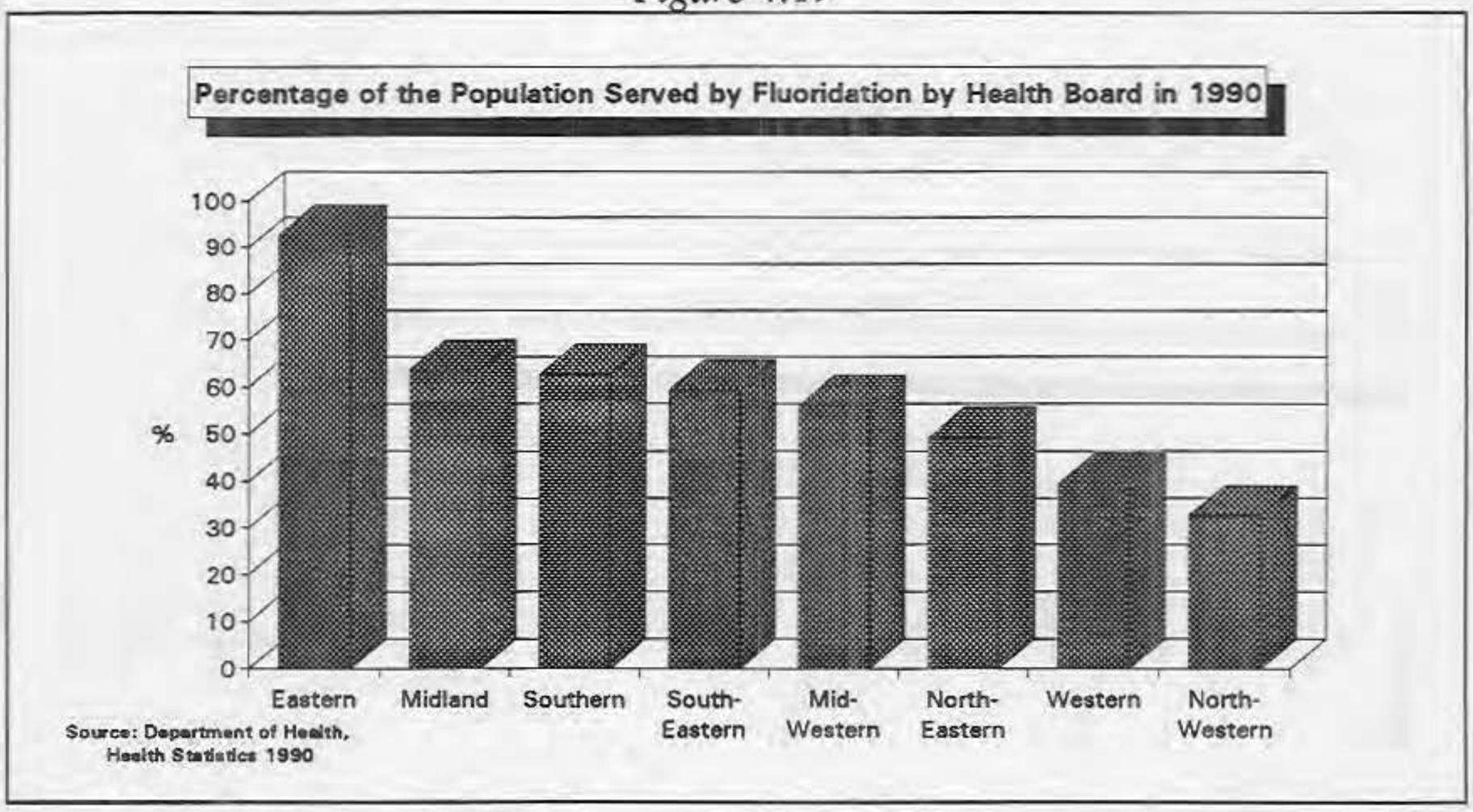
4.4.3: Dental Disease

Dental caries is a major potentially preventable condition. Two particular environmental determinants are generally considered in discussing dental health. The first is augmented fluoride intake, achieved through supplements, as for instance in toothpaste, or through the adding of fluoride to the water supply. The second relates to the consumption of sugar in the diet. Both factors must also be considered in relation to the modifying effect of dental hygiene practice and attendance at dental

services. To a lesser degree other dietary practices are considered relevant too, including practices that might either promote (raw fruit consumption) or inhibit dental decay or damage (cheese consumption) (Silva 1987).

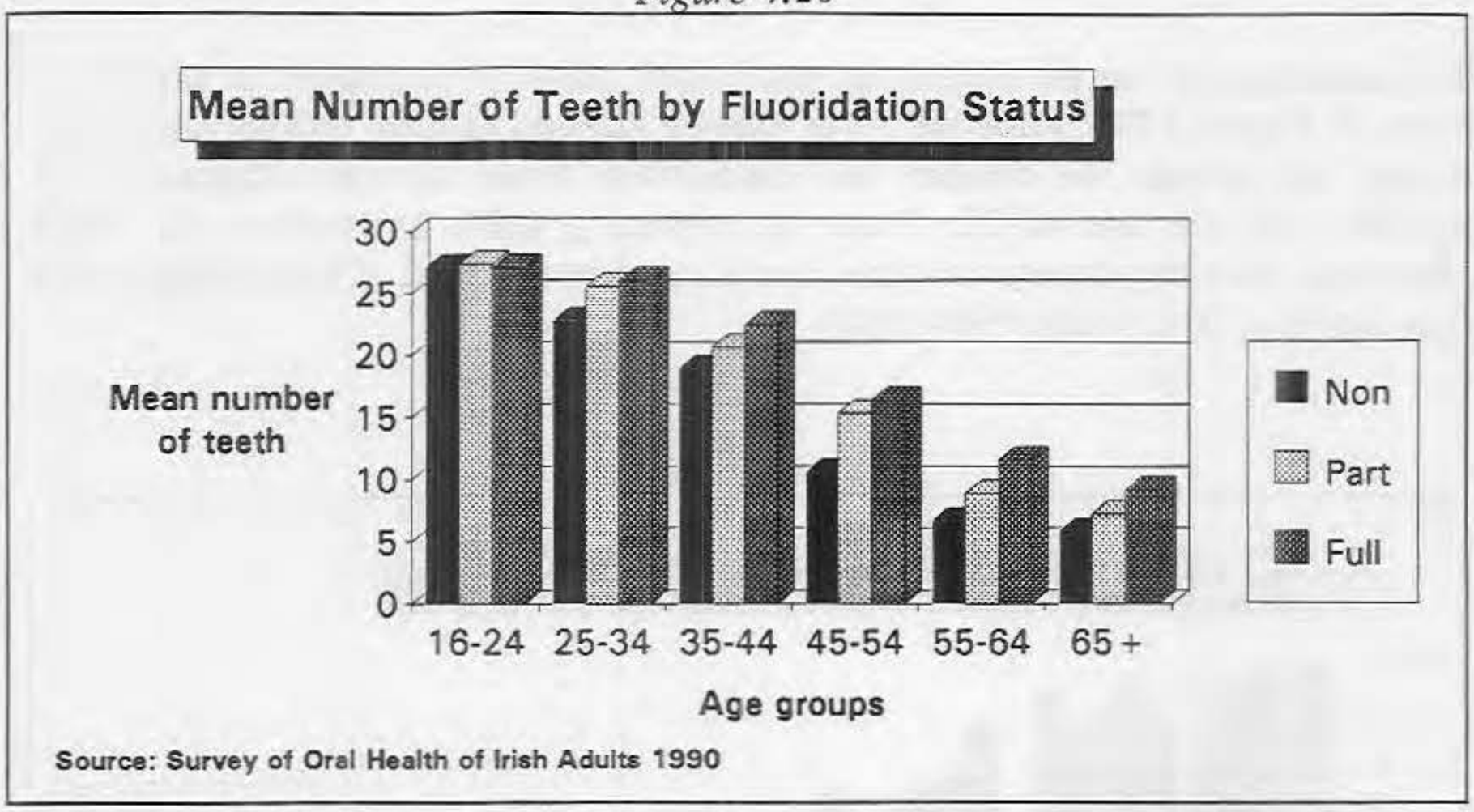
Fluoridation (addition of 1 part per million to drinking water) is now relatively widespread in Ireland but does show marked variation by health board area (Figure 4.19). The Eastern Health Board, a well-serviced population dense area achieves an average of 90% coverage, compared to the more rural western and north western areas, where coverage is roughly half that.

Figure 4.19



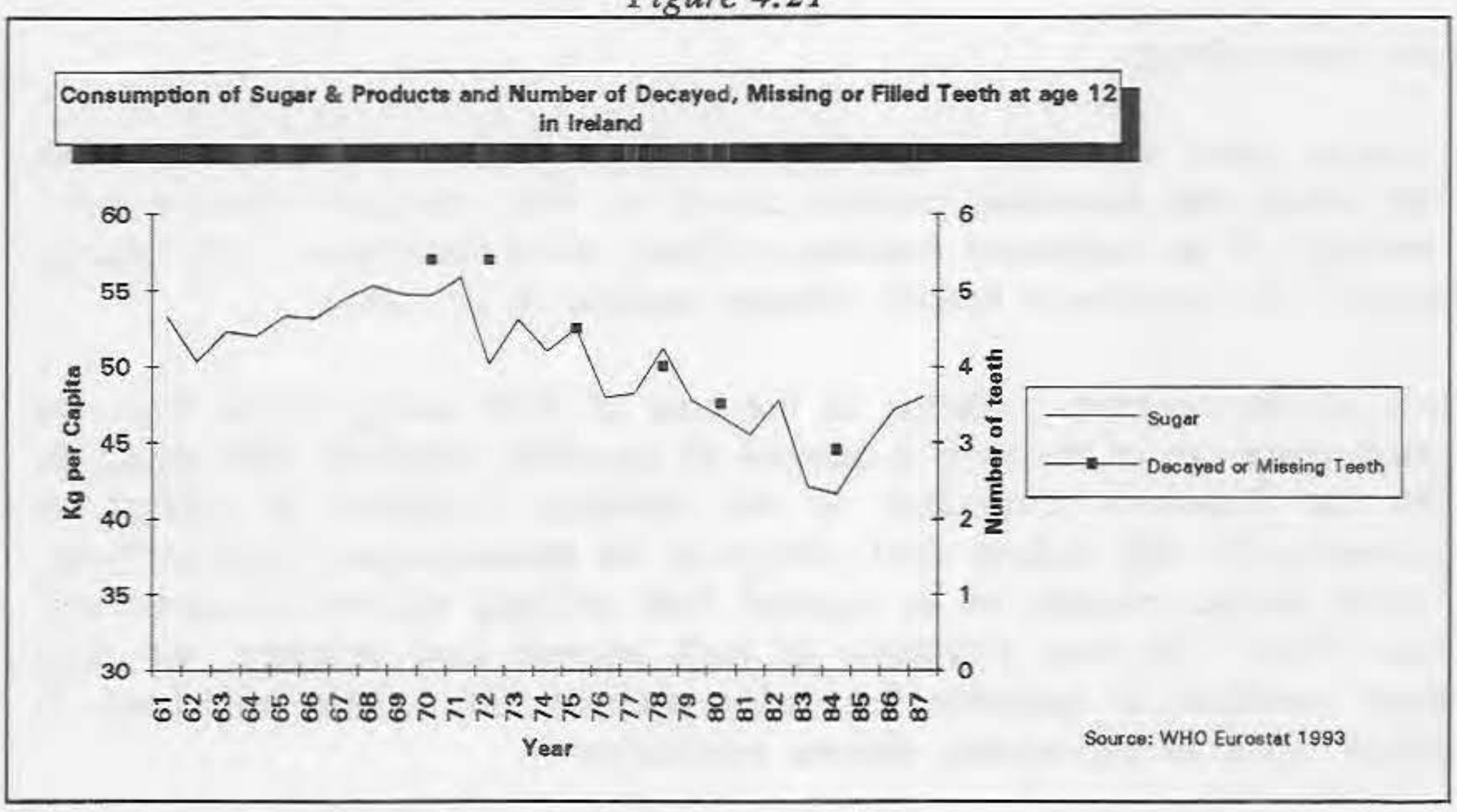
The state and nature of dental disease in Ireland in relation to fluoridation status is shown in Figure 4.20. For each age group, subjects are classified according to whether there is non, partial or full fluoridation status and then the number of teeth is recorded. For all groups over 25 years, there is a convincing graduated relationship. Since the benefit is chiefly conferred in childhood with long term gain, it is assumed that differences will emerge later in the younger group as they age. While the level of tooth loss has declined amongst Irish adults since 1979, females continue to lose more of their natural teeth at a younger age. In 1989 30 % of males aged 55-64 years were edentulous (i.e. had lost all their natural teeth) compared to 50 % of females of the same age. The percentage of subjects who were edentulous was considered higher amongst medical card holders than for other subjects: in 1990 in the 45-54 age band 23 percent of male medical card holders were edentulous compared to 10 percent of males not possessing a medical card (Survey of Oral Health of Irish Adults 1990).

Figure 4.20



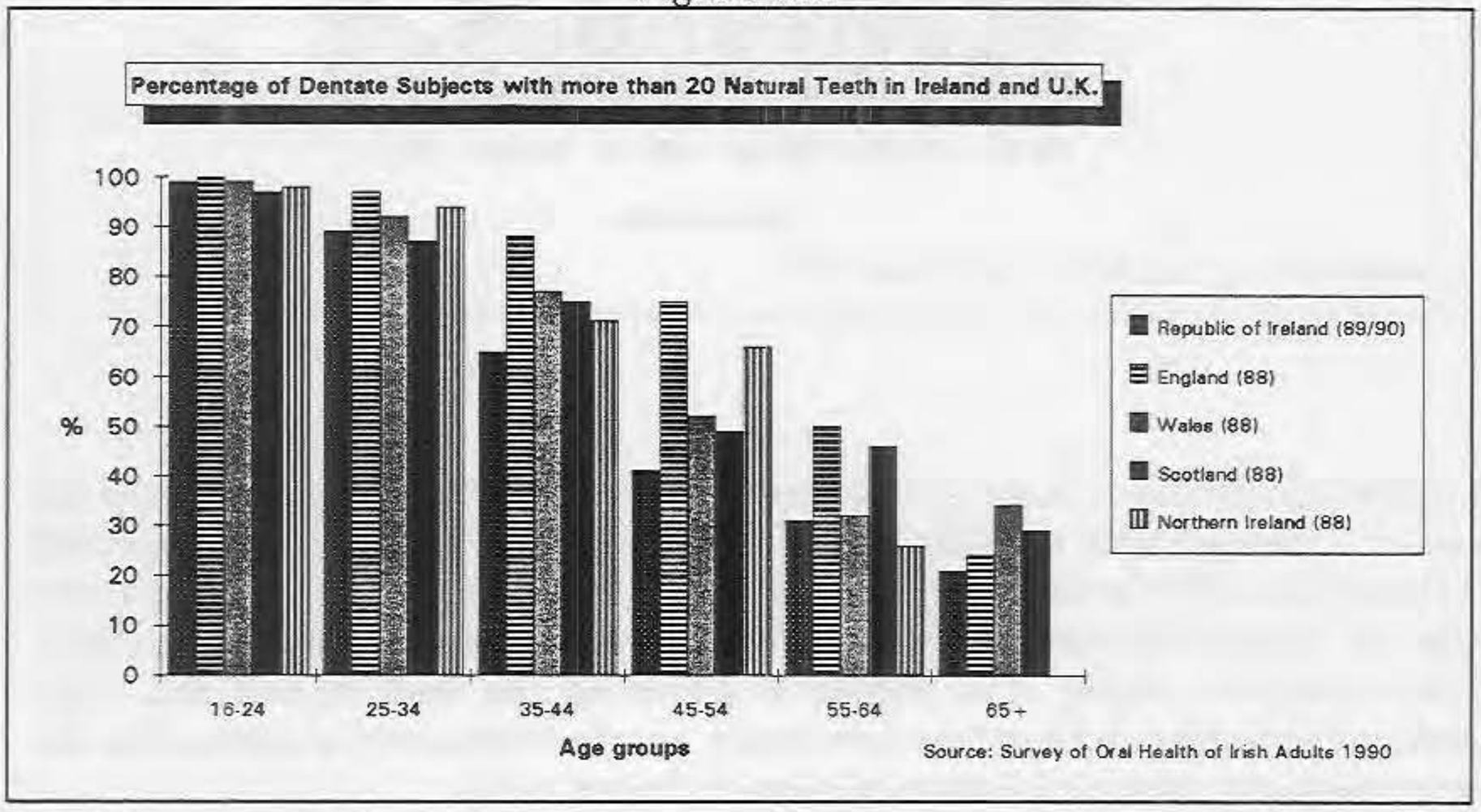
A further comparison to make is the consumption of sugar and sugar-products and the number of decayed teeth in children. Sugar consumption in Kg per capita is correlated in Figure 4.21 with the number of decayed and missing teeth recorded at specific time points in 12 year olds between 1970 and 1985. Both factors are declining, showing a close association. Again, it is realised in presenting this kind of data that other confounding factors could explain both trends, but the evidence for a relationship has been extensively debated elsewhere (Krausse & Mahan 1984).

Figure 4.21



The percentage of dentate subjects across Ireland and in each country of the UK is shown in Figure 4.22. While the % of dentate subjects is now comparable in the younger age groups the numbers are considerably lower in Irish subjects in the Republic over the age of 35. There are several possible explanations for these differences, including dietary variation, dental care and variation in fluoridation policy (Oral Health of Irish Adults 1989-1990).

Figure 4.22



4.4.4: Food Allergy

In recent years, considerable publicity has been given to, (and strong claims made about), the increasing problems caused by 'food allergies". However only a minority of the unpleasant reactions to food can be described as truly "allergic reactions" i.e. involving a specific immune reaction of the body.

Much of the reported confusion in the area of food allergy stems from the indiscriminate use of the term to describe all unwanted reactions after eating. In 1984 the Executive Committee of the American Academy of Allergy & Immunology (AAAI) defined food allergy as "an immunological hypersensitivity or truly allergic reaction to an ingested food or food additive" (Anderson and Sogns 1984). The true prevalence of both adverse food reactions and food allergy reactions is unknown, but many estimates have been calculated in different countries and among different populations.

Estimated prevalence of food allergy reactions and adverse food reactions in children have varied from 0.5% to 28% of the populations studied. An Irish study on perception of food allergy in children under 4 years showed that 12.5% of the sample were perceived by their parents to have food allergy (Sugrue, 1991). Hyperactivity was the most common symptom cited, with sweets and sugary drinks being the most commonly implicated foods. The perceived prevalence of "food allergy" among a sample of Dublin families was estimated at 8% (Sugrue, 1991).

Despite these varying estimates of the prevalence of food allergy it is generally accepted in scientific circles that the prevalence is in fact as low as 1% to 2% of the general population (Sampson 1988, Anderson 1991). However, the prevalence of food allergy reactions is higher among children. The gap between actual and alleged food intolerance is a public health issue that needs to be addressed. For instance, the perceived prevalence of food intolerance is reported to be 15-33% in Britain. There are several possible reasons for these figures. Firstly, it may reflect a large number of "genuine" cases, currently undetected. Secondly, it may be due to the sources of information about food allergy that the public have, such as T.V., radio, and print media where there is genuine confusion about terminology. There is also an apparent undue or overemphasis by alternative medical practitioners on diet as a contributory factor to ill-health. Finally, the phenomenon may reflect the confusion about what "genuine" food allergy is.

A recent study on 323 individuals with self-reported food allergy (M.Mc Gowan 1991) showed that the following were the most frequently implicated foods :

chocolate (57%)
milk (47%)
wheat (36%)
food additives (35%)
sugar (32%)
artificial colourings (29%)
eggs (28%)
oranges (27%)
meat (24%)

The most frequently reported symptoms were:

itching (43%)
skin rash (43%)
tiredness (43%)
headache (32%)
nausea (25%)
diarrhoea (23%)
runny nose (22%)

The study concluded that individuals with self reported food allergy implicated many foods and reported a variety of symptoms. Diagnosis of self reported food allergy was

not always in the conventional health care system. Higher dietary intakes of fibre, b-carotene, vitamin C, vitamin E, iron and folic acid and lower intakes of calcium were found in those that self reported milk allergy in comparison to controls. Of those that completely avoided milk, 255 had very low calcium intakes, i.e. below 400mg even after Calcium supplements were taken into account.

As discussed also in Chapter 7, the addition of food additives to food is one of the major concerns of the Irish consumer. While varied clinical manifestations due to food additives have been noted in certain conditions (e.g. tartrazine and sulphites in asthma and eczema) proven intolerance in the general public does not appear to be widespread.

Thus there are a number of quite specific responses to food items and to their constituent nutrients. In addition there are established intolerance states, for example lactase deficiency in those unable to digest cows milk or gluten (coeliac disease). There is widespread concern about the capacity of additives in food to induce unexplained and relatively non-specific responses (for diagnostic purposes). This is an area which needs to be closely monitored and is under the province and remit of the National Safety Committee and The Nutrition Advisory Group.

4.4.5: The E Number System for Food Additives

The E numbers code is a list of permitted food additives, generally regarded as safe, for use within the EC. Again there is some anxiety about their meaning and relavance. Many food additives are in fact natural in origin, but many of the synthetic additives are being viewed with care, especially in the area of symptoms which may be provoked by sensitivity to a food additives. Some additives are under consideration by the EEC and have a number but no E prefix, e.g. 621 Monosodium glutamate.

Table 4.6 Summary of Food Additives

E Number	Type of Additive	Example
E100-180	Permitted colours	E102 Tartrazine
E200-290	Preservatives	E210 Benzoic acid
E300-321	Permitted antioxidants	E320 BHA
E322-495	Emulsifiers/stabilisers	E322 Lecithin
E420-421	Sweeteners	E420 Sorbitol
E422	Solvents	E422 Glycerol
E905-907	Mineral hydrocarbons	E907 Refined microcrystalline wax
E170-927	Miscellaneous additives	E170 Calcium carbonate

Source: Manual of Dietetic Practice 1988

4.4.6: Eating Disorders

Several studies have shown that a preoccupation with slimness and dieting is a widespread phenomenon among adolescents. There is a strong correlation between this slimming craze and the incidence of eating disorders such as Anorexia Nervosa

and Bulimia Nervosa. A study of attitudes towards body size and shape amongst 437 adolescent females (Fox 1987) examined the concept of the ideal figure and the extent to which these views affected lifestyle. While the majority of subjects fell within a suitable weight range, more than half the study population had attempted to slim. This finding was regardless of age, social class or body size. Dissatisfaction with physique, accompanied by a low level of self-confidence, was observed consistently. The too-thin figure was viewed as the ideal.

4.4.7: Nutritional Surveillance in Childhood

The Nutritional status of children can be assessed by the determination of the parameters of weight and height. Routine measurement of weight and height occur at birth. Weight continues to be measured at varying intervals in the first year of life. Measurement can reassure parents that all is well where concern is expressed about the baby's intake or weight gain. Weight measurements are usually performed by the Public Health nurse or G.P.. Routine weighing occurs when the Public Health doctor sees the child at the development clinic at 7-9 months of age. The baby's weight can be used as a discussion point as regards nutrition and nutritional practices. The baby's weight is plotted on a centile weight chart. In simple terms, a centile chart expresses where the child is in relation to 100 of his peers. If the baby's weight falls below the third centile i.e. below 97% of that population, then follow up measurements may be required. Rapid downward crossing of the centiles, weight loss or prolonged failure to gain weight suggests the presence of some underlying pathology which needs further investigation. Routine weighing of every child after the first year of life is not recommended. It is usually prompted by parents or others who are anxious about a child's weight or intake of food. Weight is one of the parameters routinely measured at the school medical inspection.

Up to the age of two years height is measured in the supine position. This is not an easy task and unless expensive accurate equipment is used it is impossible to obtain reliable results. After two years of age standing height should be measured. Height velocity can also be measured. Measurements should be plotted on centile charts. The optimum age for measurement of height as a universal screening procedure is around the third birthday. Routine screening of height occurs at the school medical.

In taking measurements of height and weight standardisation of practices is very important. Regular calibration of scales and accurate measuring instruments are essential. Accurate recording of data and the ability of professionals to interpret results are vital. The centile charts for weight and height used are those specifically designed for Irish children as genetic differences made the previous English charts unsuitable for use in Ireland.

Any child noted to be under the third centile or over the 97th centile for weight and height is recorded in the Dept. of Health Child Health Biostatistics (Development Paediatric Service and School Health Service 1991). Detailed data are not recorded. Wide variation is noted in the numbers recorded across the country. This may reflect a greater diligence by some professionals in recording the data rather than a true variation in nutritional status.

The child health services have two major programmes: Pre-school and School Health service. Pre-School Services are based on developmental paediatric examinations of children at the approximate ages of : a) 6-9 months b) 12-15 months c) 24 months. School Health Services are based on: a) A comprehensive medical examination of all new entrants to national schools, b) A selective medical examination of children in the 9-10 years age group and c) An examination of other children selected on the basis of information furnished about them by their parents, teachers, nurses or other interested parties. Table 4.7 below presents clinic data by Health Board area. The remarkable variability suggests differing surveillance practice in different areas.

Table 4.7 Developmental Paediatric Clinics 1990: number of children and as a percentage of total number with confirmed conditions in each Health Board Region after 6 month examination.

Health Board	Nutritional Status over 97th percentile 6 mths	%	Nutritional Status under 3rd percentile 6 mths	%
Eastern	15	1.9	10	1.3
Midland	25	12.0	8	3.8
Mid-Western	51	39.2	39	30.0
North Eastern	11	2.9	26	6.8
North Western	18	40.0	4	8.9
Southern	38	16.5	6	2.6
South Eastern	22	8.0	14	5.1
Western	72	16.4	53	12.0

Source: Development Paediatric Service and School Health Service 1991

The Irish Vitamin Study was launched in Dublin in 1981 to determine if periconceptional supplementation with either folic acid alone or a multivitamin preparation alone could reduce recurrence risk of neural tube defects (NTDs) in women with a previously affected offspring from 5% to 15 or less. The results which were recently published demonstrated the efficacy of folic acid in preventing NTD occurrence. These findings are consistent with those of the U.K. Medical Research Council (MRC) trial (MRC Vitamin Study Group 1991). The MRC trial provides evidence that periconceptional supplementation with folic acid and reduced the risk of recurrence of NTD's and recommends a daily dose of 4mg.

4.5: Dietary Related Risk Factors

In this section we discuss intermediate risk factors believed to link diet to other diseases. Data on these risk factors are not routinely or systematically collected and we rely for the most part on dedicated research for information. Three important population risk factors are body mass index (which relates to obesity, diabetes, heart disease and some cancers) blood pressure (which relates to dietary salt intake, obesity, alcohol consumption) and total cholesterol (an indicator of dietary fat intake).

4.5.1: Body Mass Index (BMI)

This is an expression of ideal body weight in relation to height (weight /height^2). It cannot accurately account for mass related to muscle as opposed to adipose tissue (Fat) but gives general indications of population prevalence of obesity. Overweight is a recognised risk factor for hypertension, hyperlipidemia, diabetes, and as a result, cardiovascular disease. The National Nutrition Survey (1990) found that 53% of adult men and 33% of adult women were overweight with an additional 10% of males and 15% of females classified as obese. Overweight for men is defined as a BMI > 25 and for women >23. Obesity was classified as a BMI > 28.

A study carried out on Irish Secondary school children (Watson 1990) found that 1/4 of both sexes were overweight. This study also found that 1/4 of the boys and 1/3 of the girls were seriously lacking in aerobic fitness and half the males and 1/3 of the females had very inadequate levels of flexibility.

The Kilkenny Health project baseline study 1985 showed that 48% of people were overweight with an additional 16.4% in the obese category. The post programme in 1990 showed that 46.5% of subjects were overweight with an additional 19.4% obese.

Table 4.8. Distribution of BMI Categories for Men and Women in Offaly and Kilkenny.

	Offaly		Kilkenny	
	1986	1991	1985	1990
'Acceptable'	34.4	25.0	35.7	34.1
Overweight	47.4	48.5	47.9	46.5
Obese	18.2	26.5	16.4	19.4

Source:Kilkenny Health Project 1992

The obese were older but the distribution by social class did not differ significantly from the non obese. Serum total cholesterol was higher in obese men but HDL cholesterol (the relatively cholesterol fraction) was lower in obese men and obese women. Systolic and diastolic blood pressure were significantly higher in obese men and women but smoking status was similar. In a multiple logistic regression analysis, systolic pressure in men and diastolic in women remained significantly associated with obesity; there was an inverse association between obesity and HDL cholesterol in women and between obesity and HDL cholesterol as a proportion of total cholesterol in men. There was an association between obesity and hypertension in males and females and in low levels of HDL cholesterol in females.

4.5.2: Cholesterol

The Kilkenny study shows that there are signs of decline in mean total cholesterol over time in both counties (table 4. 9). This is reflected in the percentages in those achieving desirable levels (figure 4.23). In 1986, mean cholesterol level was over 6 mmol/l in both counties. This had shown a decline of almost half a mmol in Offaly by 1991. The declines were more marked in women in both counties. The ideal level of total cholesterol should be 5.2mmol/l or less. It remains the case that sizeable proportions of the population have levels greater than ideal. The declines over time are modest. In earlier research the baseline study in Kilkenny identified a decline in cholesterol in older men relative to middle-aged men. This may be explained by attrition due to death of those with very high cholesterol levels. Women also show a steep increase in total cholesterol level after the menopause, in part due to the relative protection conferred by circulating oestrogens before that time.

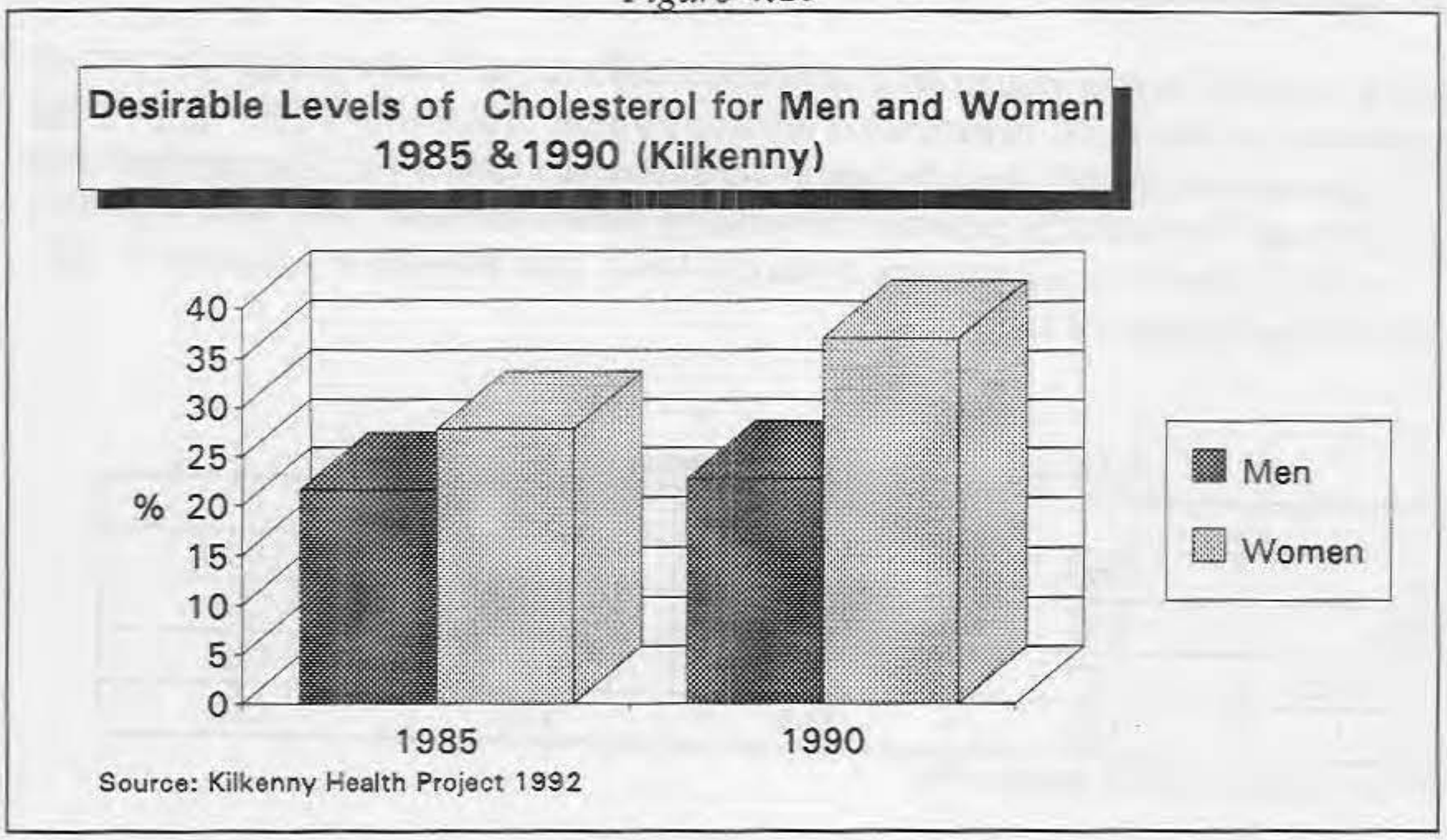
Table 3 .9 Mean Serum Total Cholesterol, (mmol/l)

	Offaly		**Kilkenny**	
	1986	1991	1985	1990
Men	6.00	5.56	6.04	5.95
Women	5.91	5.56	6.01	5.62
Total	**5.96**	**5.56**	**6.03**	**5.79**

Source: Kilkenny Health Project 1992

The fact that cholesterol declined in the reference rather than the intervention county is a source of speculation and is likely to be addressed more fully by the primary investigators of that study in their final report. However, data from several sources in this report indicate some decline in mortality from CHD generally and a decline in consumption of certain types of saturated fat. The inter-relationship if any, between these factors merits further investigation. Further, it is likely that lifestyle awareness hs become prevalent beyond Kilkenny in the last 8 years and indeed may be spreading from adjacent counties. This phenomenon, known as contamination is difficult to quantify in epidemiological studies. The change in cholesterol is also reflected in the percentages in those achieving desirable levels (figure 4.23) in Kilkenny at both time points.

Figure 4.23



A Northern Ireland study on coronary risk factors in school children (Boreham et al 1992) looked at 1015 children aged 12 and 15 years to obtain baseline information on blood pressure, lipid profile, cigarette smoking, family history, physical activity, cardiorespiratory fitness, and dietary intake.

The results showed that :-

In 12 year olds :-

15-23% displayed increased blood pressure
12-25% had unfavourable lipid profiles
18-34% were over weight

In 15 year olds :-

16-21% admitted being regular smokers
26-34% displayed poor cardiorespiratory fitness
24-29% reported little physical activity in the previous week

Dietary analysis revealed relatively low polyunsaturated to saturates fatty acid ratios and high mean fat intakes accounting for approximately 40% total daily energy. Despite the exclusion of family history from the analysis, 16% of the older children exhibited 3 or more risk factors.

4.5.3: Blood Pressure

Blood pressure level is related on a population basis to salt intake though the precise mechanism for its role in hypertension remains unclear. Trends for both Kilkenny and the reference county indicate a decline in blood pressure over time. The reported data has not been controlled for possible confounding factors however. The other important factor in relation to blood pressure is alcohol level. The findings in Kilkenny in 1985 and 1990 are presented in Table 4.10.

Table 4.10 Mean Systolic Blood Pressure, (mmHg)

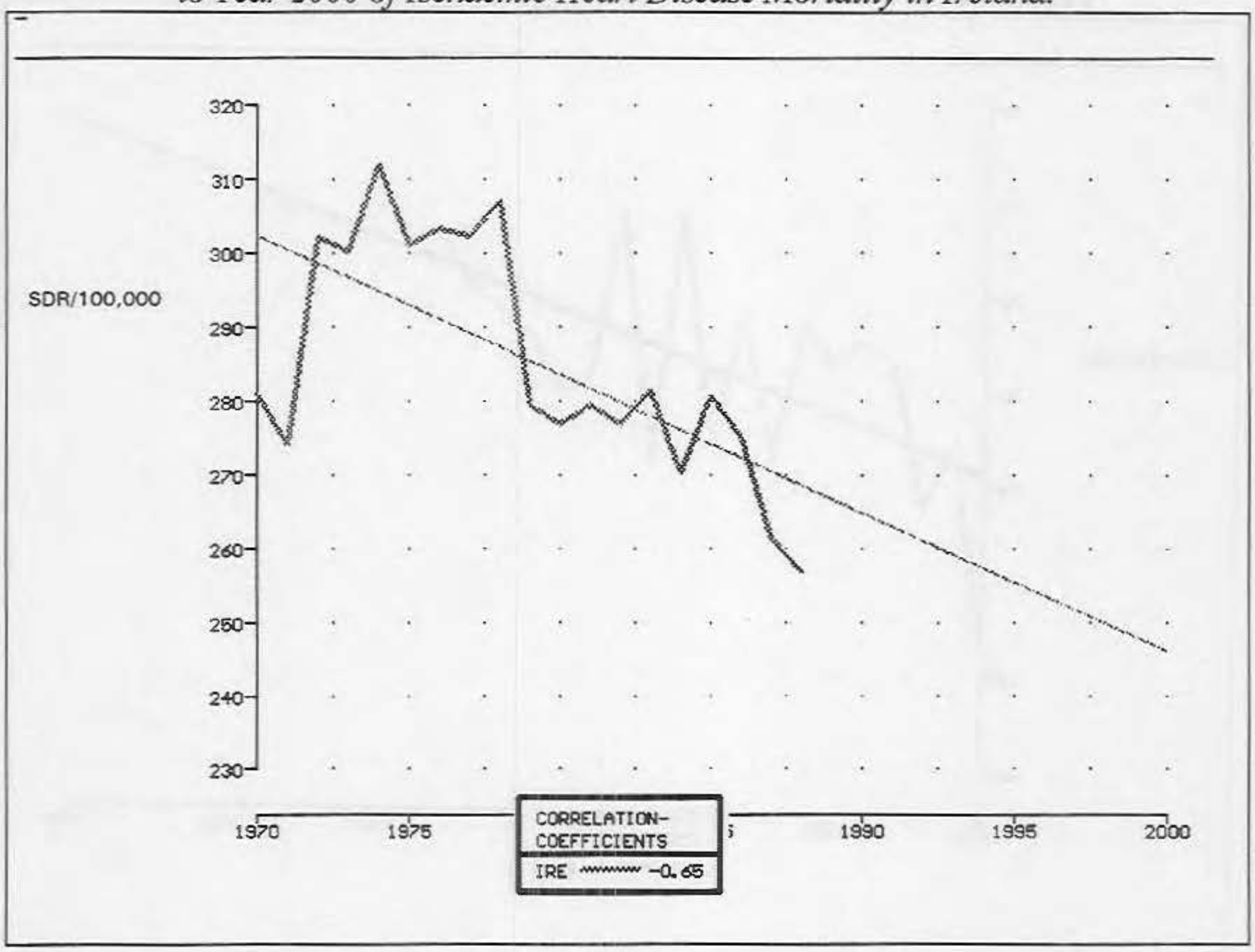
	Offaly		**Kilkenny**	
	1986	1991	1985	1990
Men	143	138	144	138
Women	137	130	140	132
Total	**140**	**134**	**142**	**135**

Source: Kilkenny Health Project 1992

4.6. Future Morbidity and Mortality Trends

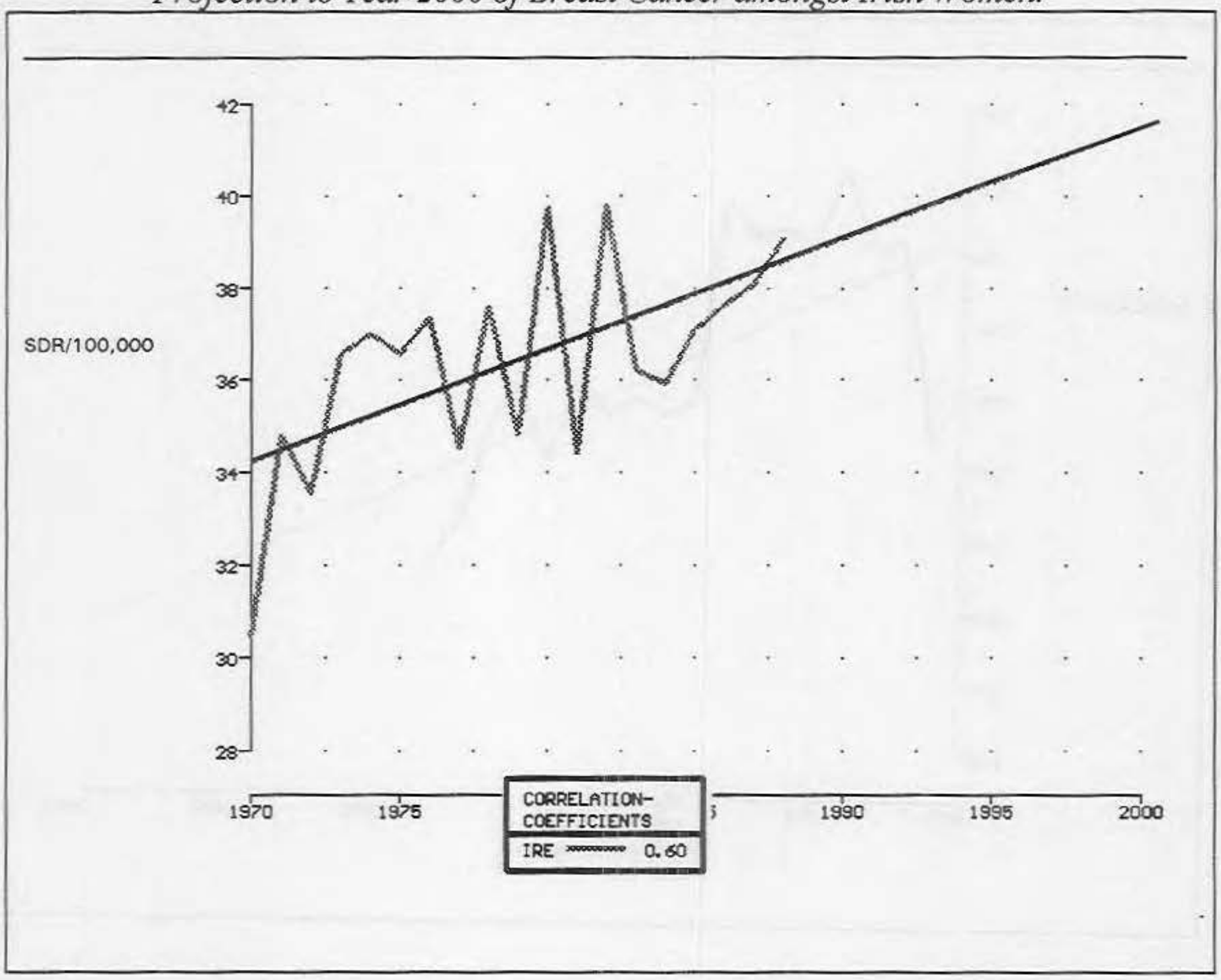
An important part of the on-going work of the Surveillance Centre will be the prediction of trends in outcome indicators related to dietary trends and taking account of the many inter-relating factors that are likely to influence these. A rather more simple approach already currently available in routine statistics are time trends predicted by producing a regression coefficient for the relationship to date between time and a given condition. These trends are provisional and depend on relatively unchanged patterns of the contributing risk factors.

Figure 4.24
Standardised Death Rate (SDR), Correlation Coefficient and Projection to Year 2000 of Ischaemic Heart Disease Mortality in Ireland.



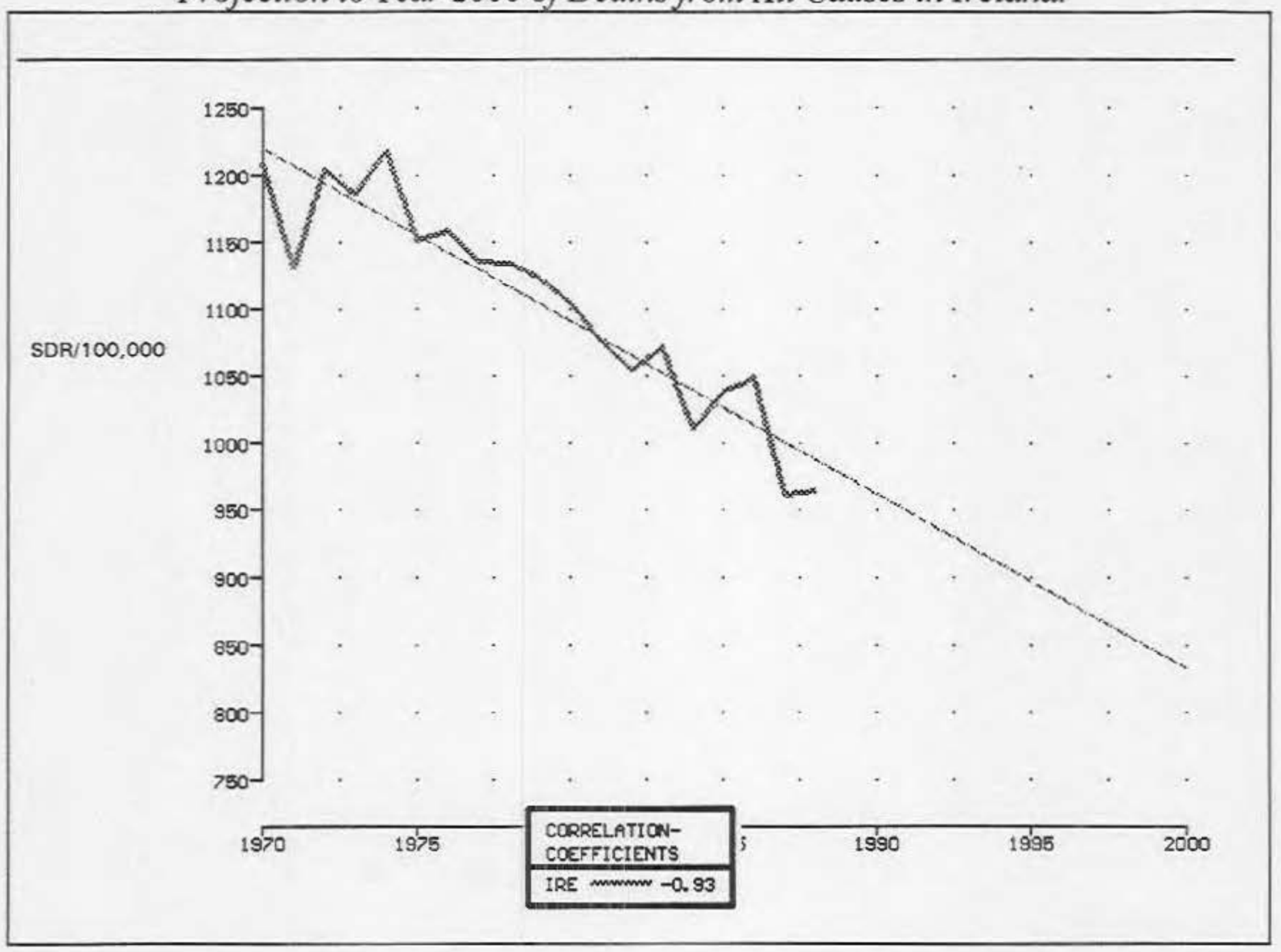
For instance, Ischaemic heart disease (standardised for age) can be shown to be declining over time in Figure 4.24 above, so that by the year 2000, death rates should by less than 250/100,000 per annum.

Figure 4.25
Standardised Death Rate (SDR), Correlation Coefficient and Projection to Year 2000 of Breast Cancer amongst Irish Women.



Conversely cancer of the breast will continue to show increased mortality (Fig 4.25) though all cause cancer mortality rates will continue to decline to less than 849/100,000 (Figure 4.26).

Figure 4.26
Standardised Death Rate (SDR), Correlation Coefficient and Projection to Year 2000 of Deaths from All Causes in Ireland.



The importance of more complex analysis to weigh the relative contribution of improved treatment and lifestyle change on these figures will be an important ongoing role for the surveillance centre.

Chapter Five

The Food Chain: Food Production and Distribution

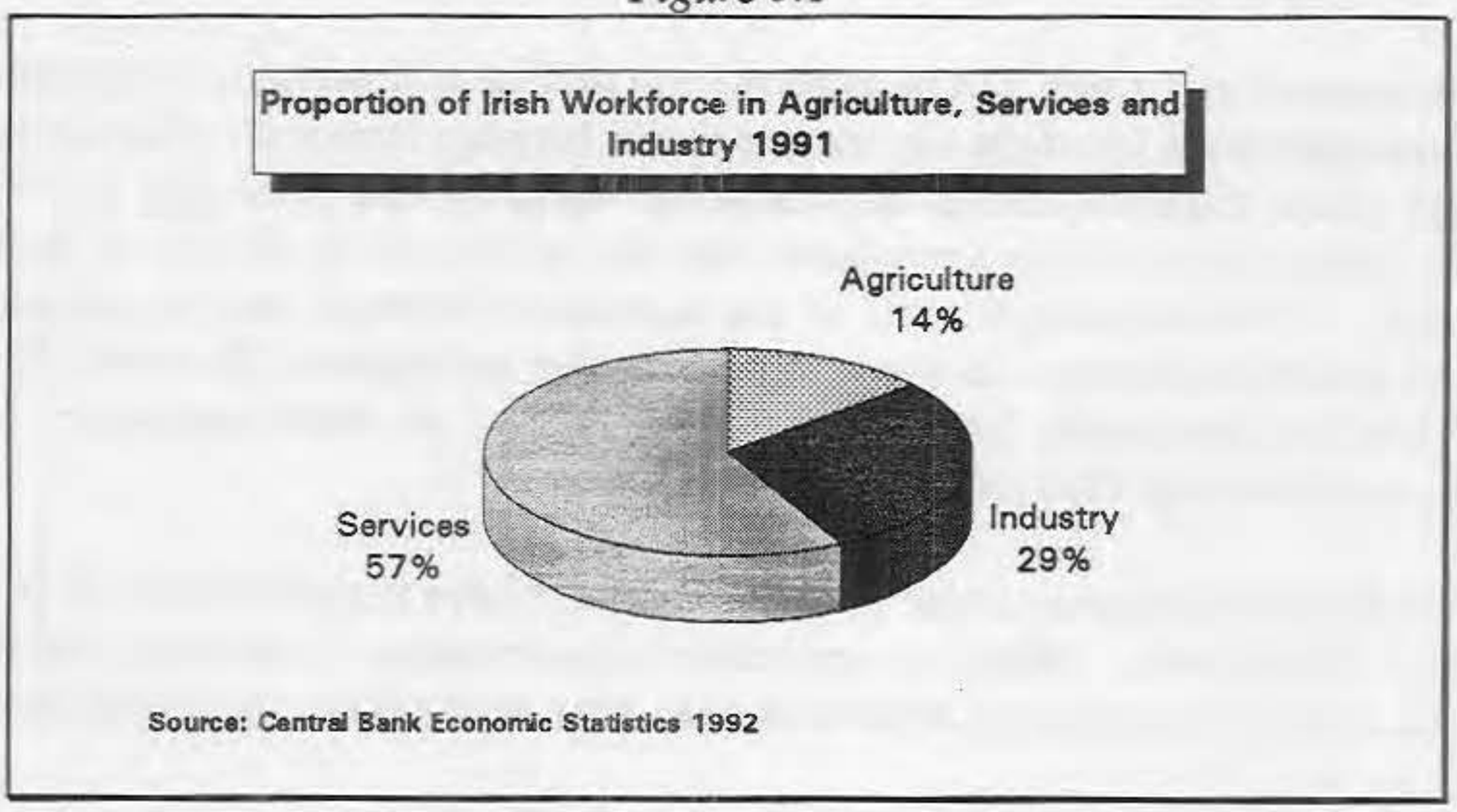
5.1: Introduction

This chapter first examines the total workforce, including those employed in industries related to the food chain. Comparisons with other EC countries are made. The production pattern in the country as a whole is reviewed, including patterns of export and import. Recommendations for change within the food industry in recently produced government reports are profiled.

5.2: The Profile of the Irish Workforce

The population of Ireland was recorded as 3,523,401 in the 1991 Census. In 1992 the total labour force was estimated at 1,350,000. However 22% of this labour force were unemployed in January 1993. The proportion of those employed in agriculture is high compared to EC standards but has declined from 25% in 1973 to about 14% in 1991, (figure 5.1).

Figure 5.1



It is important to consider the demographic profile and division of the farming workforce to best evaluate its potential as a workforce. It is estimated that 44% of Irish farmers (Cuddy 1984) of Irish farmers are in the 55 years and over age group.

The food industry is estimated to account for 22% of total exports and 20% of all manufacturing jobs. An expert group was established by the Minister for Agriculture and Food in 1992 to review how the value of the food industry could be maximised. They identified the most important sectors as those producing milk, beef, pig meat, sheep meat, cereals, drinks and poultry, while fish and horticultural products, though still relatively minor, were also of growing importance. The group recommended that farming and food processing representatives should be closely involved in national policy formulation and in on-going action and information on nutrition, so that dietary requirements may be reflected as closely as possible in what is produced. It should also be noted that in the EC the number of farmers is decreasing while the number of consumers is increasing, thus implying the future importance of including consumers in policy decisions.

5.3: The European Situation

We now look at the food system in Europe. Within the EC, the food system comprises 320m consumers, spending on average a 1/4 of their incomes on food, ranging between 19% in Germany and over 40% in Greece and Portugal. From the Household Budget Survey 1987 it is suggested that approximately 35% of disposable income in Ireland is spent on 'basic' necessities - the higher figure reflects the relatively higher food prices in Ireland. It is important when comparing purchasing patterns in different countries that allowance must be made for real income, for example real income in Germany is higher than in Ireland, thus a smaller percent of income is spent on food.

One important trend which can be expected to continue and which is important to all our considerations is the change in relative power between farm and consumer ends of the food chain. Europe's 10m farmers currently represent little more than 1/3 of those farming when the CAP was formulated with the signing of the Treaty of Rome 30 years ago. This downward trend in the numbers of farmers may be expected to continue under the forces of technology, demography and income. However, diversity could lead to sustainable farming with more interest in environmental or 'green' farming in Ireland and thus creating more employment.

Conversely, over the same period, consumer numbers have increased and will continue to do so, albeit slowly. While the agriculture lobby remains a remarkably strong and important one, the emergence of the consumer movement,with its increasing interest in

food, leads to the inevitable conclusion that policy decisions are going to have to reflect this emerging countervailing system (Fast II).

Development in food manufacturing concerns increasingly sophisticated methods of preservation, entailing processes such as chilling (in combination with controlled or modified atmosphere packaging) and irradiation, which permit the preservation of many products from all over the world in 'near fresh' condition. This has important implications for trade (within and outside the community) and for regional specialisation. Equally, it has produced a whole new range of consumer concerns whose justification warrants examination and monitoring systems.

5.4: Ireland as a Producer

Ireland is a large producer of primary products, with a small population, and the food industry's main markets are outside the country. This is further accentuated by the fact that mechanisms of price control such as those utilised under the Common Agricultural Policy create a slightly artificial situation, whereby market forces and/or consumer demand need not necessarily dictate supply. Alternatively, patterns of production and supply need not necessarily dictate consumption patterns either.

Recent developments in the Irish food industry include moves towards growth in the range of processed foods. The growing market dominance of a reduced number of retail companies has increased their buying power and improved their negotiating stance with regard to the food manufacturers (see also chapter 6: Food reatil and supply). During the 1970s recession focused consumer attention upon price. This factor, plus the availability of better consumer information about products, contributed to a general weakening of loyalty toward manufacturer brands. The major food retailers were in a position to exploit this situation through, for instance, the development of Own Brands, which provided the retailer with an improved profit margin and met the consumers demands for lower priced alternatives to manufacturer brands. However, the typical consumer enters the market with a price bracket in mind, and this is what gives rise to the phenomenon of the market demand curve, where if the price falls too much people won't buy on the assumption that the quality has dropped (Gabor 1966).

The market share taken by distributor brands is growing in most countries in the EC. The growth of distributor brands to some extent reflects the growth of multiple food chains, as these organisations promote these product ranges (Fast II).

5.5: The Agricultural Sector

The estimated agricultural output in Ireland is displayed in table 5.1. Note the following figures do not include areas of agricultural output such as horses, turf and wool.

Table 5.1 Estimated Agricultural Output in Ireland in £millions with percentages of total in brackets.

	1989		1990		1991	
	£ Million	(%)	£ Million	(%)	£ Million	(%)
Animals, Livestock & Milk	2744.2	(85)	2600.2	(84)	2494.8	(82.4)
Poultry & Eggs	115.2	(3.6)	124.0	(4)	134.6	(4.4)
Crops & Cereals	369.7	(11.4)	377.5	(12)	398.2	(13.2)
Total	3229.1		3101.7		3027.6	

Source: Annual Report of the Minister of Agriculture and Food 1991.

Comparing figures for agricultural output for 1989 with 1991, there is an increase in the percentage of output from crops and cereals with a decrease in the figure for animals, livestock and milk, while still accounting for over 80% of all agricultural output. These changes are modest however.

It is reported (McNutt 1991) that within the agricultural sector, cattle and milk production continues to dominate output, accounting for 71% of the value of output in 1989. The importance of dairying in particular is illustrated by the 1987 Teagasc National Farm Survey (Agriculture and Food Policy Review 1990), which shows that of 68,600 full time farms in operation, 48,500 or 70% were involved in either dairying or a combination of dairying and cattle (table 5.2).

Table 5.2 Full time farms by Farming system 1987

	Dairying	Cattle	Dairy/Cattle	Other	Total
Full time Farms	32,400	7,800	16,100	12,300	68,600
%	47.2	11.4	23.5	17.9	100

Source: Agriculture and Food Policy Review 1990.

During the fifties the pig and pork industry engaged in a successful marketing campaign increasing the market share. It was not until the mid eighties that the Co-ops went public in Ireland and this led to the diversification of dairy products. The Irish dairy industry has however been out-performed by other EC member countries in its willingness to diversify into new products (table 5.3). One of the recommendations of the Expert Food Group is that cheese output should increase from the 1990-1992 average of 77,000 tonnes to over 125,000 tonnes by 1997.

Table 5.3 Distribution of Milk Usage (%)

Output	Ireland	UK	Holland	Denmark
Butter	61	21	38	40
Cheese	17	20	33	32
Fresh Products	13	52	11	15
Others	9	7	18	13

Source: Agriculture and Food Policy Review 1990.

The agricultural sector is heavily dependent on the EC price support mechanism. In 1990, the Department of Agriculture estimated that 41% of beef output, 54% of skimmed milk powder and 55% of butter were sold into intervention. This high level of dependence on intervention payments is linked to the high degree of seasonality of production of both beef and milk. Five times as many Irish cattle are slaughtered during the Autumn peak as in the Irish slack season, while milk production peaks at over 150,000 tonnes in May and June, falling to under 20,00 in December and January. Seasonal production peaks tend to coincide with periods of market weakness, so that producers are encouraged to sell into intervention, which provides a guaranteed price and does not require costs of market or product development. As a result, since the development of the Common Agricultural Policy, Irish agricultural production has been support-led, rather than market led.

One of the recommendations of the Expert group on the food industry is that the pattern of seasonality needs to be reduced. This would encourage product development while retaining cost advantages. Changing the seasonal supply pattern and the product mix means higher cost to farmer and processor and new product/new marketing arrangements need to provide enough price incentives to counterbalance cost increases. In the milk sector the aim should be to reduce the percentage used for butter from 60%-65% to 50%-55% over a 3 to 5 year period, increasing our share of the EC hard/semi hard cheese production from 3% to about 5% and reducing our share of EC butter production from around 8% to 6% but these targets may have to be revised in light of the GAT outcome. In beef the aim should be to achieve 20% of slaughterings in each of the three quarters of the year.

5.6: Total Exports and Imports

Exports and imports may reasonably be expected to reflect market forces and hence relate to consumer demand. Total exports of all classes of goods (including re-exports) in 1991 were valued at £15,025m as against £14,337m in 1990 by the Annual Report of the Minister for Agriculture. Total imports were valued at £12,853m as against the 1990 figure of £12,469m. The principal export and import market continues to be the United Kingdom which accounted for 32% of total exports and 41% of total imports. Total agricultural exports (including re-exports) were valued at £2,046m in 1991 as compared with £1,965m in 1990 (Annual Report of the Minister for Agriculture 1992). The main agricultural exports are outlined below.

Table 5.4 Estimated Agricultural Exports in Ireland in £millions with percentage of total in brackets.

Commodity	1989 £ Million %	1990 £ Million %	1991 £ Million %
Live Cattle	110.9 (6.6)	116.2 (7.4)	70.3 (4.5)
Meat & Meat Products	1375.2 (81.4)	1250.3 (79.3)	1289 (81.8)
Dairy Produce	101.2 (6.0)	104.8 (6.6)	108.4 (6.9)
Fruit & Vegetables	57.7 (3.4)	57.6 (3.7)	58.2 (3.7)
Animal Feeding Stuffs	43.5 (2.6)	47.2 (3.0)	50.2 (3.2)
Total	**1688.5**	**1576.1**	**1576.1**

Source: Annual Report of Department of Agriculture 1992.

The increase in dairy produce export may indicate the emergence of Ireland as a competitor in production of dairy products for export abroad, but as indicated in table 5.3, Ireland is still primarily a butter producing country.

The future environment for the food industry will be determined by the CAP reform effects (it will become more difficult to produce more main stream products profitably) the outcome of the GATT Uruguay Round Negotiations (which will likely go on in the direction of reducing market supports) the single market (which will expose most Irish Food Companies to greater commercial pressures) and emerging EC food legislation (this might reduce the flexibility of some manufacturers in relation to, for instance, the range of permitted additives and might increase the costs of complying, for example, with any new labelling or packaging laws) (Report of Expert Group on food Indusrty 1993).

5.7: Distribution and Retail

In Europe at retail level, the trend has been towards bigger stores and centralised distribution systems. In France, for example, 2% of grocery stores accounted for 56% of turnover in 1988 compared with 48% for Ireland but only 14% for Sweden (Wilsen Hartnell 1993). Factors like geography and distance within each country, the level of economic development, legislation and concentration of trade buying have an influence on overall figures. The figures for foreign trade, i.e. imports and exports from 1974 to 1991, are shown in tables 5.5 and 5.6.

Table 5.5 Irish Imports from 1971 to 1991

Imports **Sources**	***1974*** **%**	***1983*** **%**	***1988*** **%**	***1991*** **%**
U.K. & N.I.	52	45	42	41
Other EC	20	22	24	24
Other European	7	7	4	7
U.S.A & Canada	8	16	17	16
Others*	13	10	13	13

* In 1991 Japan accounted for 5% of this figure.

Source: Trade Statistics of Ireland

Table 5.6 Irish Exports from 1971 to 1991

Exports **Destination**	***1974*** ***%***	***1983*** ***%***	***1988*** ***%***	***1991*** ***%***
U.K. & N.I.	55	37	35	32
Other EC	14	32	39	42
Other European	3	7	6	7
U.S.A & Canada	14	9	9	10
Others*	14	15	11	9

Source: Trade Statistics of Ireland

In 1974, the UK. accounted for more than half of Ireland's foreign trade due to both geographical proximity and historic trading patterns. This figure has reduced to 32% in 1991. The growing importance of the EC as a market is reflected in the rising percentages across the years. The actual value of the Irish market in total is difficult to calculate but estimates and approximate relative sizes for selected markets are available from the Government National Income & Expenditure Reports. Table 5.7 is assembled from available data.

Table 5.7 Estimated Retail Value of Some Irish Markets in £million, 1988 & 1991.

	1988	1991
Milk	250	280
Fish	-	100
Ice Cream	45	70
Bread	-	187
Butter	43	35
Dairy Spreads	28	43
Margarine	23	22
Frozen foods (excl Ice Cream)	85	100
Soup (packaged & canned)	19	20
Coffee	17	20
Biscuits	85	100
Breakfast Cereals	-	65
Chocolate & Sugar Confectionery	250	250
Snack Foods	-	75
Soft Drinks	225	324
Beer	1,200	1,300
Fabric Detergents	30	50
Cars	61,000 units	67,749 units
Cigarettes/Cigars/Tobacco	550*	600

Source:National Income & Expenditure 1987,1990 CSO

* Cigarettes only

From table 5.7 above, the estimated value of the beer market alone is shown to be worth £1,300 million, approximately 722 million pints a year or 1.9 million a daywhich is just below the total expenditure on the Health Service of approximately £1,600m.

5.8: The Fish Industry

The contribution of the fish industry to the Irish economy in 1985 and 1990 is valued below. The composition of the catch in 1989 was 66% pelagic (includes herring, mackerel, horse mackerel etc.), 20% demersal (includes dogfish, monkfish, whiting, cod etc.) and 14% shellfish (crabs, mussels, periwinkles etc.). The following figures indicate the growth in the industry between 1985 and 1990.

Table 5.8 Estimated Value of Fish Industry

	1985 £m	***1990 £m***
Seafish landings	63	90
Aquaculture	5	30
Employment in fleet	7778	7910
Employment in aquaculture	1228	2550
Exports	95	170

Source:Ireland, Facts about Fishing 1992

Aquaculture -the farming of salmon, trout, oysters and mussels - has increased its share of the National catch to 25% of total value (£40 million in 1992). Much of this production is exported to EC markets e.g. Ireland produces 10,000 tons of salmon per annum and exports 60% of its output. The Irish Salmon Industry competes intensely with Norway (output 150-180,000 tons per annum) and Scotland (output 40,000 tons per annum) in European markets.

The total wild catch is regulated by the Common Fisheries Policy of the European Community, which has placed severe restrictions on vessel tonnage and annual quotas for the main species. The Department of Marine plans to invest £100 million in upgrading the Irish fishing fleet, marketing and processing capacity in the 1993-1999 National Plan.

5.9: Future Directions

Under the heading of nutrition the Expert Food Group states that "the food industry is expected to produce food which will achieve the aim of consumption of food which will safeguard and promote human health" (Expert Food Group 1992). One member of the Expert Food Group, Senator Fergal Quinnn was noted as dissenting with the proposal to keep responsibility for food within the Department of Agriculture, Food and Forestry because he felt that the marketing function should be seperate from the production.

Research into commericial opportunities for new product development was undertaken by An Bord Trachtala, the Irish Trade Board in 1988-1992. They identified 40 import products they considered to be lucrative for both the Irish and export market from the 100 fastest growing food and drink categories. Irish food processors also have to compete with imported rivals from other EC countries which, because of their bigger home markets, are often able to launch new products earlier and so have a head start on Irish products.

Categories were reviewed to identify the areas experiencing high absolute growth, high growth rates and areas where opportunities would appear to be high. The 100 identified products were then further screened to pinpoint 40 categories by investigating the reasons why Irish firms had traditionally not produced them. The 40 food products suggested by An Bord Trachtala are to a large extent "convenience foods" .

The final list is shown below:-

Vegetables
Processed Potato Products
Frozen Potato Chips
Prepared Vegetables

Cereals/ Bread
Frozen Bread
Breakfast Cereals
Crispbread
Pasta

Miscellaneous
Vinegar
Cooking Oils
Hydrogenated Vegetable Oils
Pate
Soy Sauce
Tomato Based Sauces

Fish
Breaded Fish Products
Fish Soup
Mussels and Scallops
Processed Shrimps and Prawns

Biscuits. Cakes, Confectionery and Sugar Products
Biscuits
Cakes and Baking MixesPate
Confectionery
Glucose
Lactose

Dairy
Animal Based Dairy Spreads
Cheddar Cheese
Speciality Cheese
Frozen Desserts
Fromage Frais
Yoghurt
Whey Powder
Creamed Rice
Mayonnaise
Ice cream
Eggs

Meat
Bacon
Prepared/Preserved Beef
Ham
Processed Meats-Poultry

Beverages
Flavoured Waters
Apple Juice
Canned and Bottled Beer

5.10: Methods of Preservation

The two main categories of processed food are 'near fresh' and 'highly processed'. At the near fresh level, preservation methods already allow us to eat mangoes, papaya, kiwi fruit and such exotic products which were previously unattainable because they travelled so poorly. Similar developments have also seen previously seasonal products - raspberries, strawberries, new potatoes available throughout the year. Further improvements in preservation technology will stimulate the development of high quality agricultural products. With meat, research into breeding and husbandry will focus on the nutritional attributes (particularly fat content and the polyunsaturated/saturated fat ratio) and taste. As the pressure on land falls we might expect another look at the potential of exotic farming of deer and other game. Fish is another high value, nutritionally fashionable food and one would anticipate that research will increase the variety of breeds which are amenable to farming thus again widening consumer choice.

Chapter Six

The Food Chain: Retail and Supply

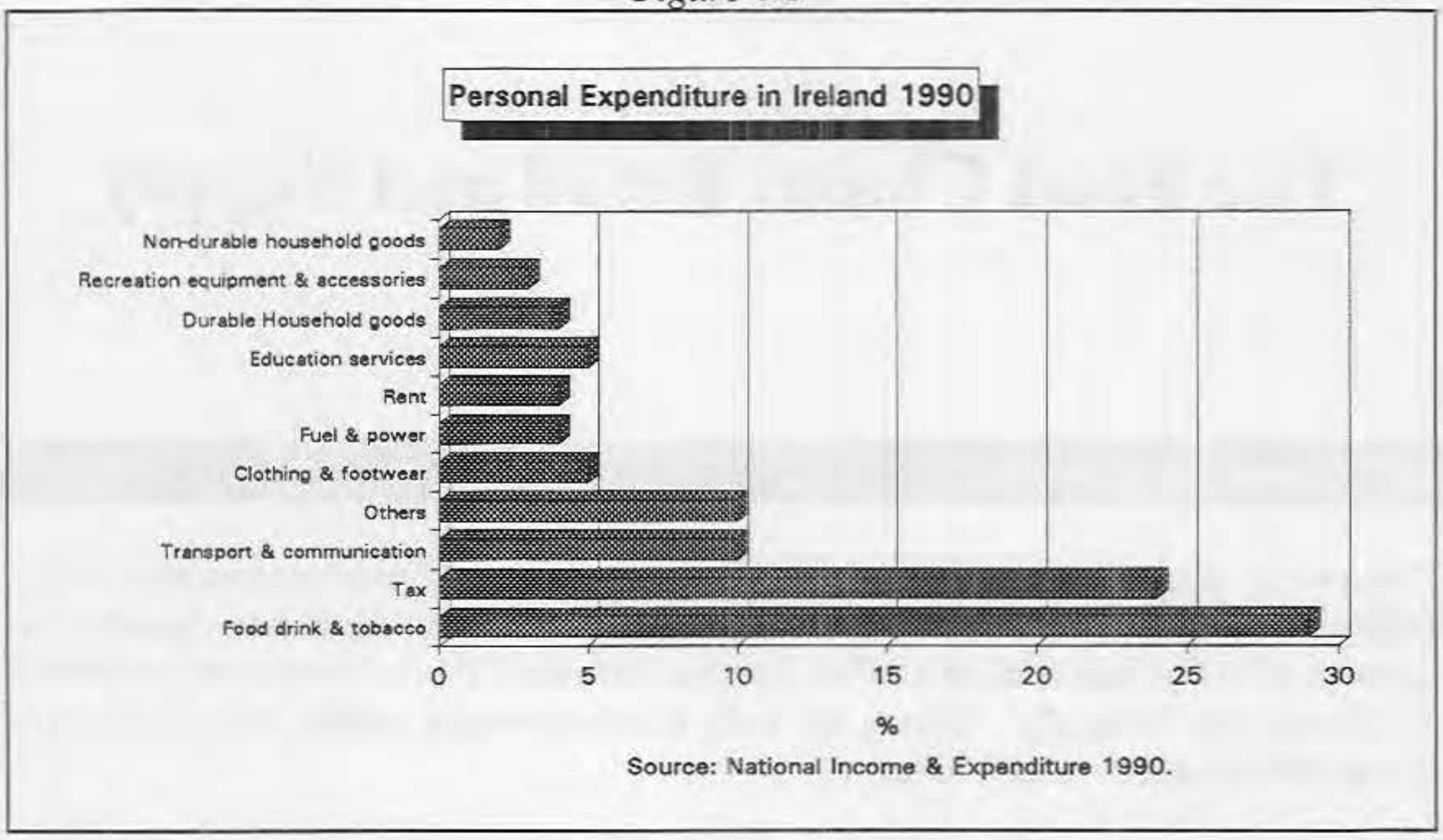
6.1: Consumer Patterns

Consumers' expenditure on food in the EC as a percentage of total expenditure is now falling. Within the EC, the food system comprises 320 million consumers spending an average of 1/4 of their monies on food (ranging between 19% in Germany to over 40% in Greece and Portugal). During the early 80s the average weekly grocery bill was about £40 compared to £60 today.

Due to the zero population growth across Europe, food manufacturers and retailers will need to fight for an ever decreasing percentage of personal expenditure. With the number of consumers in the over 50 years of age group increasing across Europe the food industry will have to provide for consumer tastes that reflect the diet of an ageing population. Fewer Economy packs and products geared towards children will be required and marketing strategies must focus on the habits of middle and older age groups as they become a major force in consumer spending over the next 20 years. Sales of reheatable convenience foods rose by 5% over the past few years in Europe. Chilled food sales in Europe are projected (Anderson 1993) to rise from $36.7bn to $46.3bn between 1988 and 1993.

The two main areas of personal expenditure by individuals in Ireland are a) Food, Drink & Tobacco and b) Tax, accounting for 53%. Expenditure on tax has risen from 8% in 1966 to 24% in 1989. The actual itemised percentages of personal expenditure in Ireland in 1990 is shown below (figure 6.5). It should be noted that mortgage repayments are treated as capital expenditure and consequently not included in this figure.

Figure 6.1

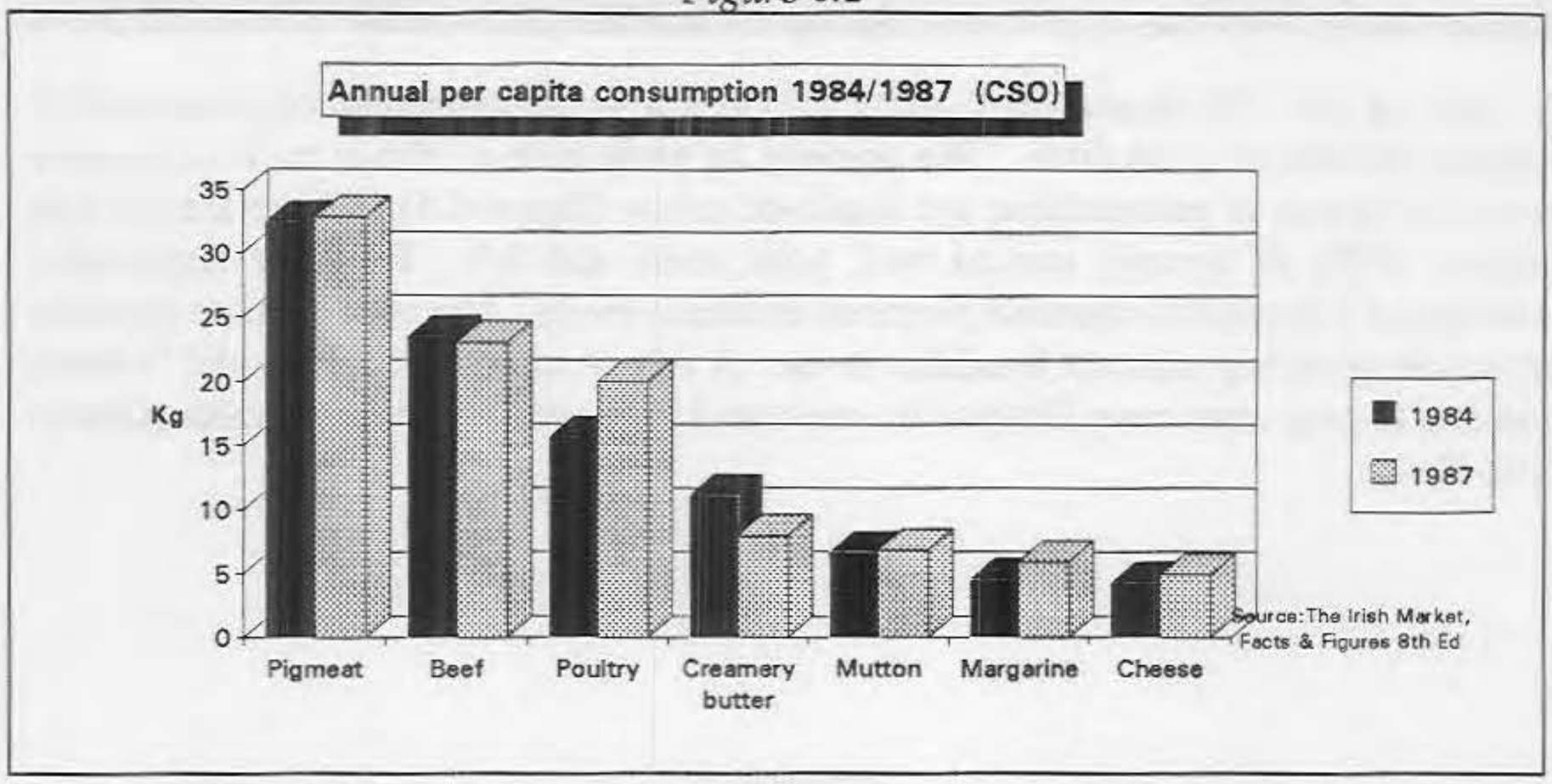


6.2: Health Issues as a Consideration in Consumption

The most significant international trend in food consumption at the moment is that relating to health and nutrition. European consumers are following this trend and there has been a change in consumption patterns, especially in relation to some dairy products and certain meats; a concentration on health aspects of food consumption especially in regard to fat levels; an increasing emphasis on what are perceived to be fresh and/or 'natural' products and organics, and the growth of the convenience food section.

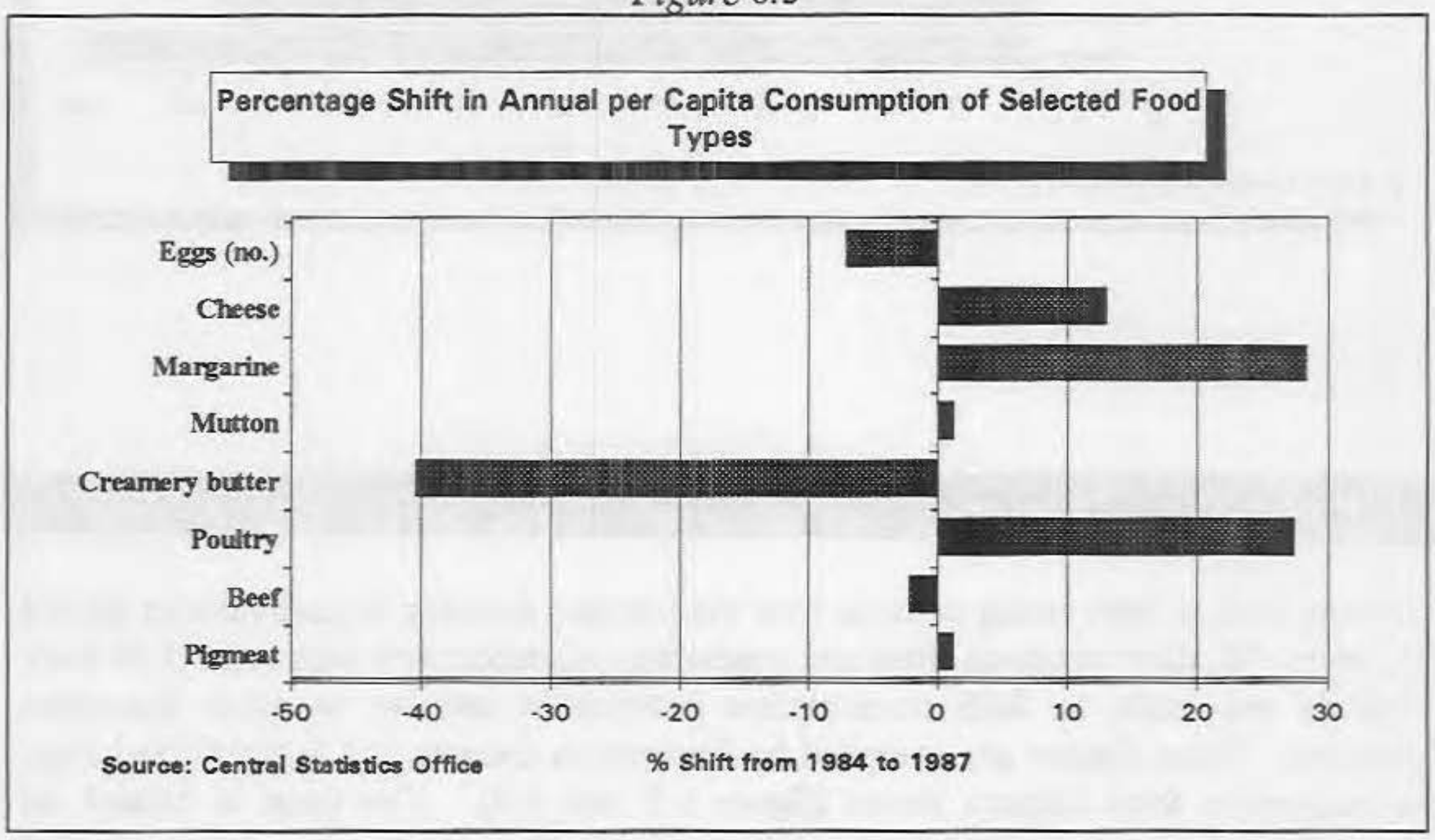
As a population, Ireland has one of the highest calorific intakes by world standards. The past ten years have shown a decrease in high per capita consumption of high carbohydrate products. Over the same period there has been an increase in sales in Ireland of cheese, poultry and pigmeat, where sales of these products peaked in the early 1980's.

Figure 6.2



The percentage change in consumption for these items over the 84-87 period is shown below. One of the most remarkable declines has been in consumption of butter, contrasted with the increase in margarine.

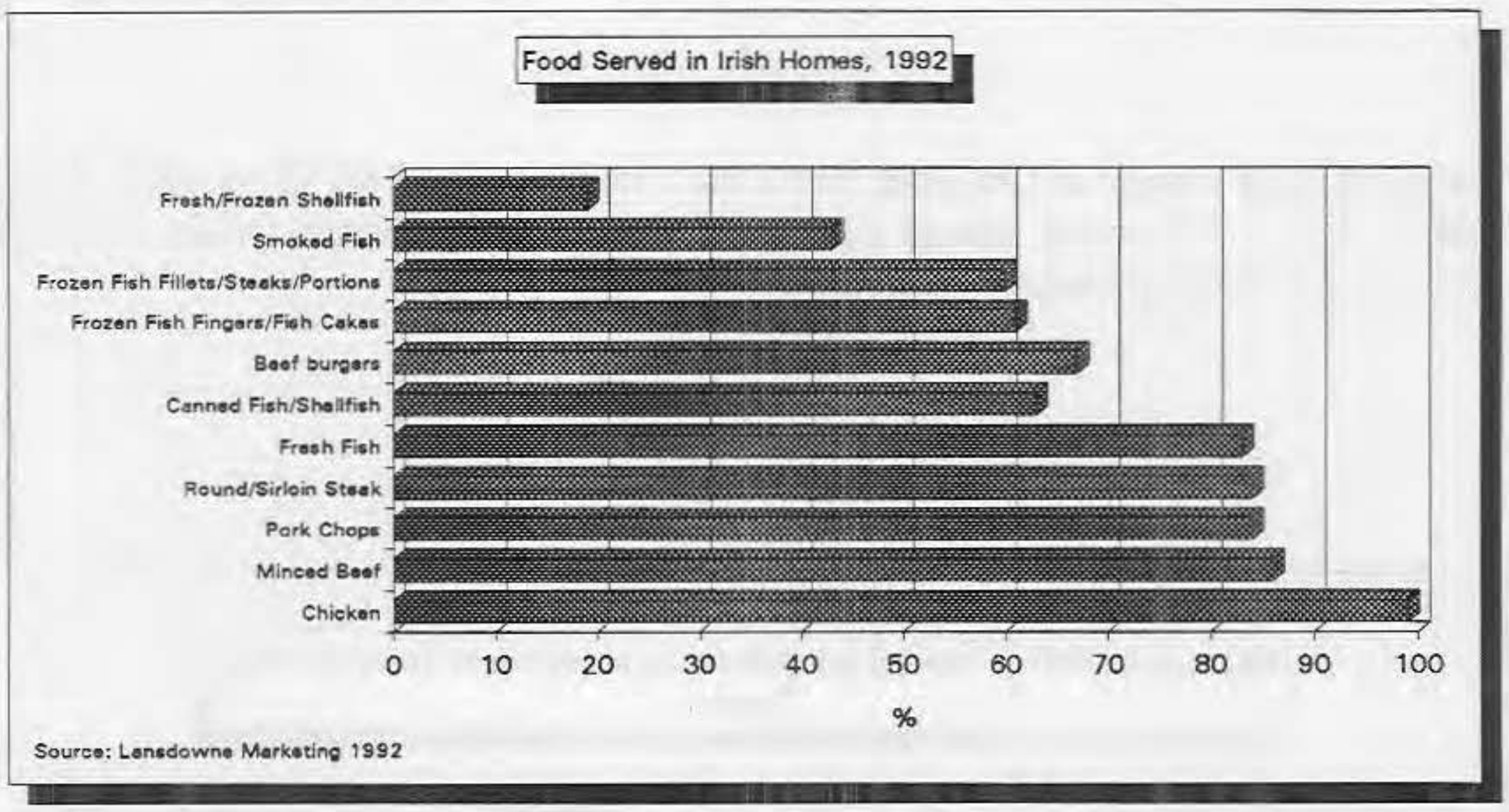
Figure 6.3



6.3: Data Sources on Consumer Patterns

As part of the 'All Housewives' study of 1993 a good indication of consumption patterns in Ireland is available. The primary, or main course, foods most commonly served in homes at present time are displayed below (figure 6.4). These are chicken (almost 100% of homes), minced beef, pork, steak and fish. However appreciable numbers of households consume prepared or frozen foods. The market share by socio economic grouping was not available to us. A recent survey in Galway did indicate that fish fingers were more likely to be consumed in lower income households (Dineen et al 1992).

Figure 6.4



6.4: Irish Eating Patterns

We now look at Irish eating patterns over the last two decades, in particular to animal fats, butterfat, dairy products, fruit and vegetables. Comparisons with respect to dairy products are made to Irish consumption patterns in relation to other European countries. These figures are compiled by Eurostat in Geneva and are collected from the respective food balance sheets (figure 6.5 and 6.6). The peak in animal fat consumption in the early 80s is not readily apparent and may relate to a terminological Butterfat consumption has however been staedily declining.

With respect to liquid milk, consumption in Ireland is seen (table 6.1) to have the highest consumption with Belgium ranked lowest, while Irelands consumption of cheese and youghurt is lowest in the EC. Butter consumption in Ireland ranks seventh with Greece ranking lowest.

Figure 6.5

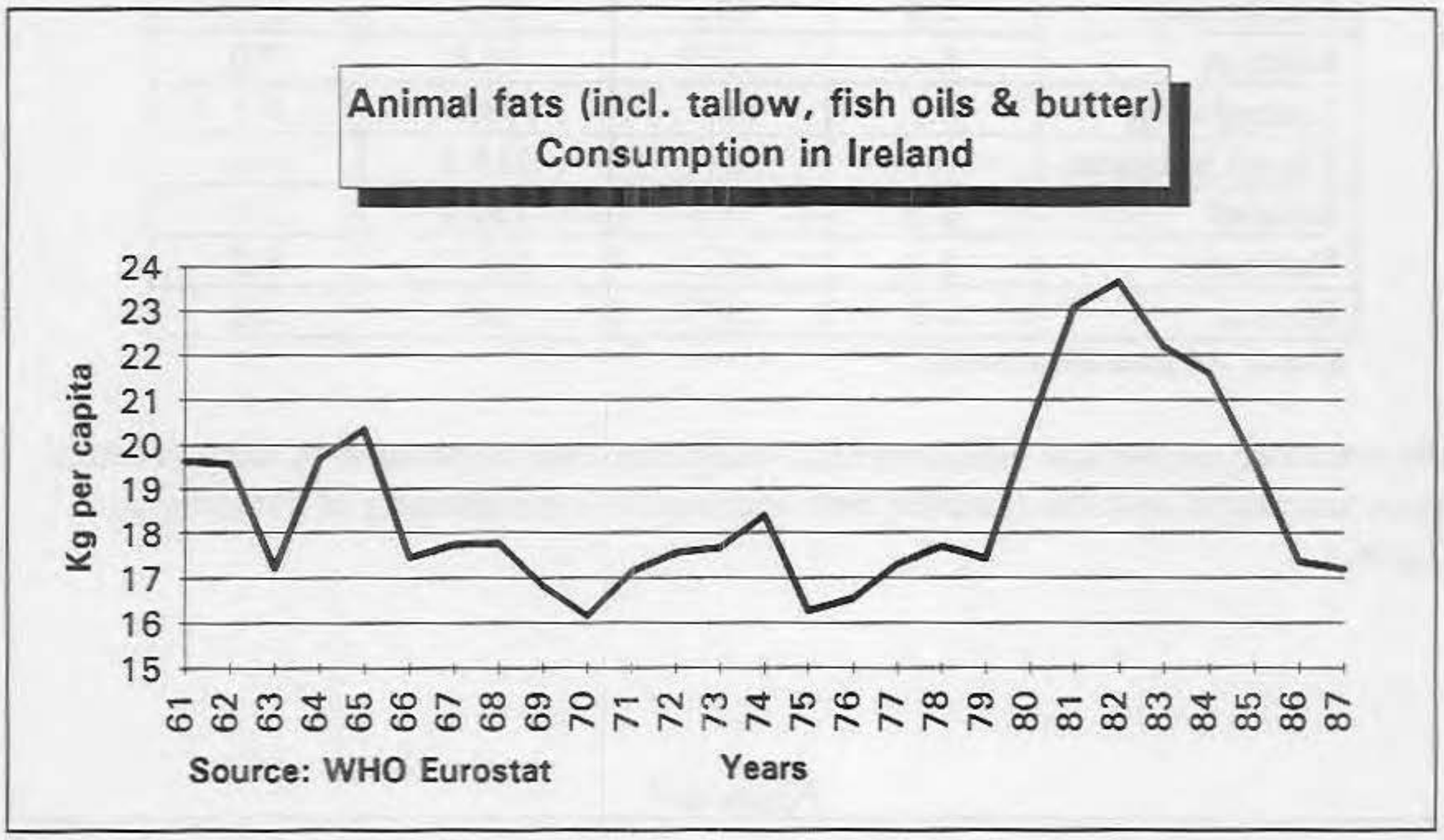


Figure 6.6

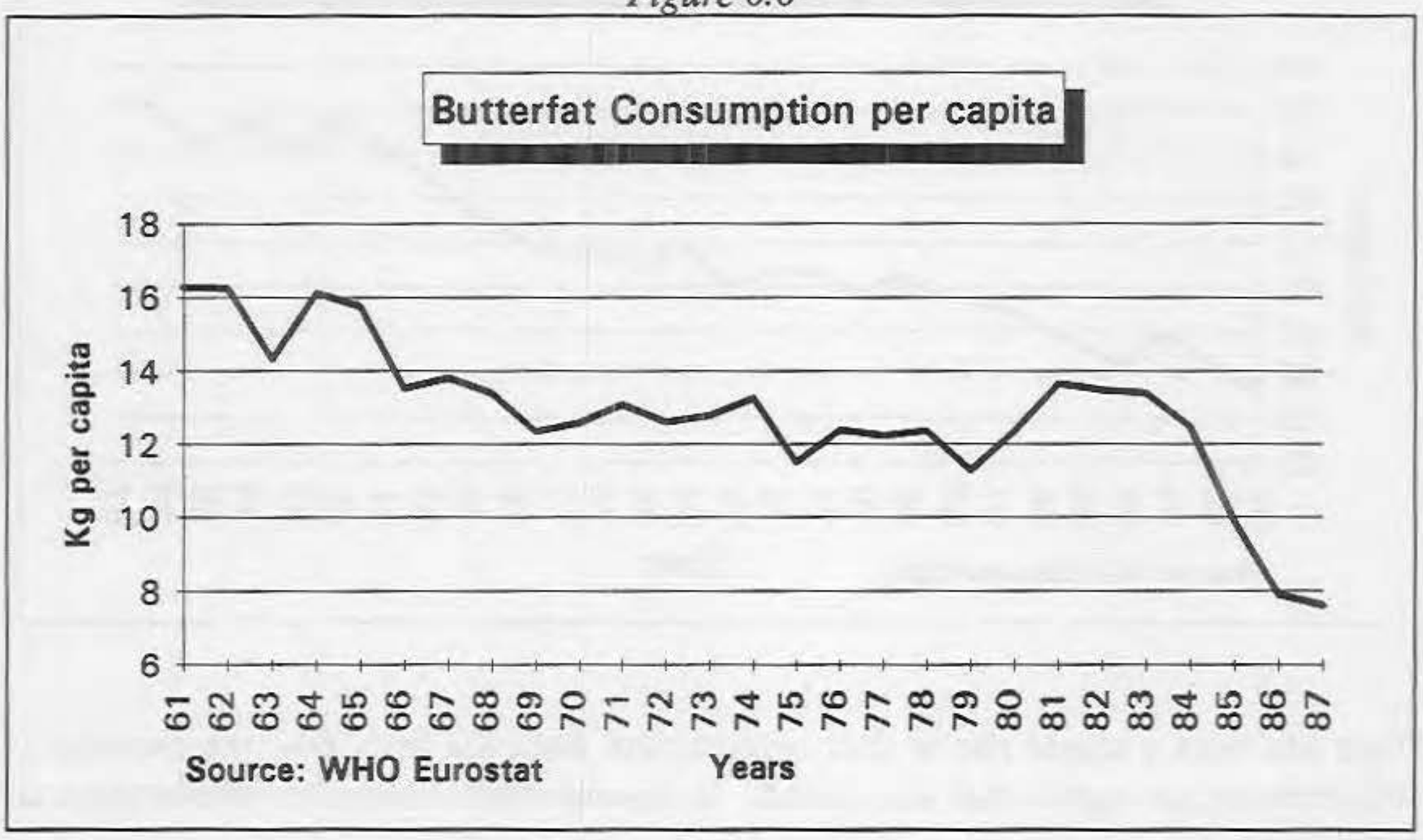


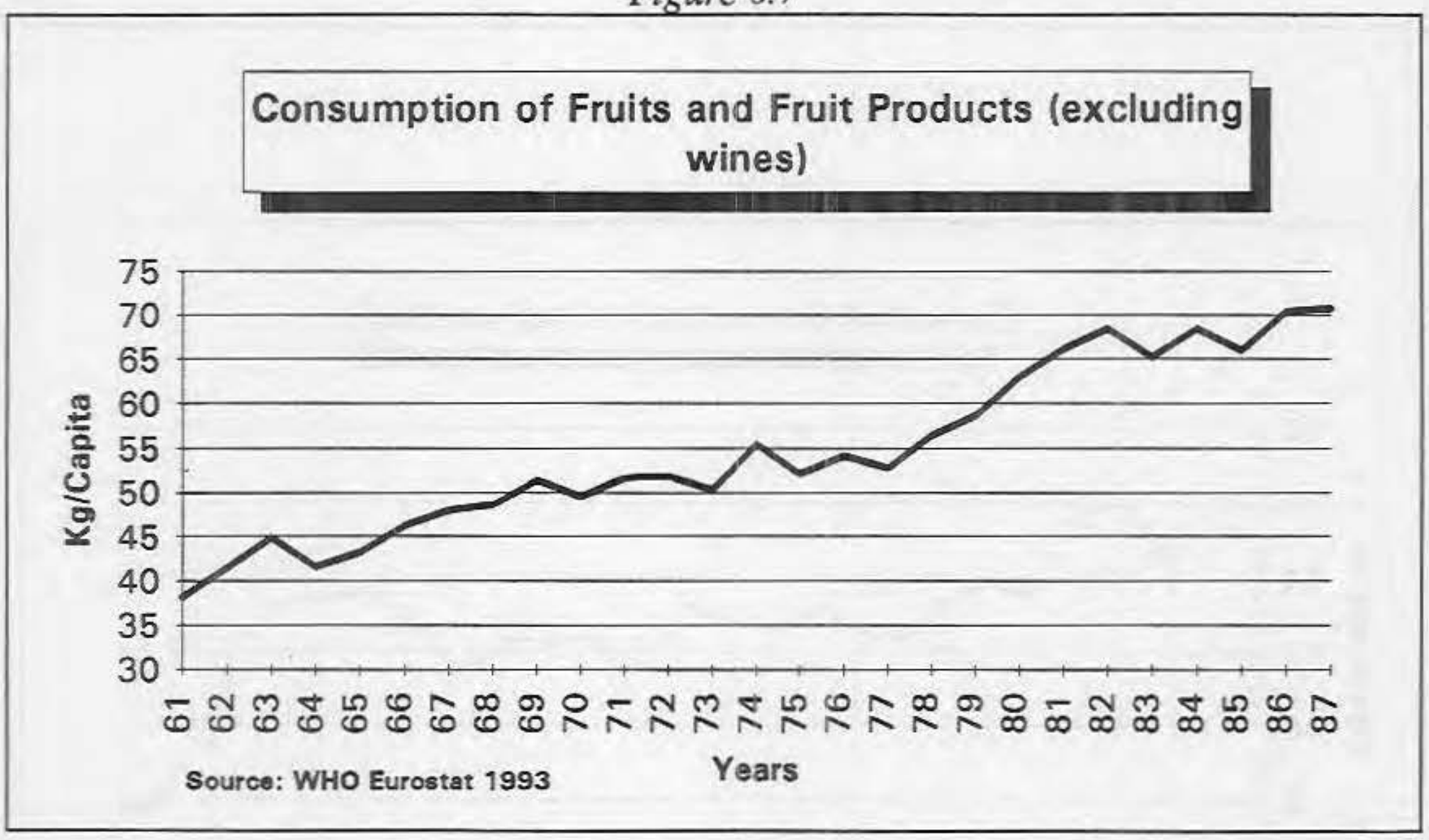
Table 6.1 European Kg Per Capita Consumption of Dairy Products 1991

	Butter	Cheese	Liquid Milk	Yoghurt
EC-10	4.6	17.1	87.1	8.8
Germany	6.5	18.4	68.8	10.6
France	6.5	22.9	77.7	16.8
Italy	1.9	18.6	80.5	n/a
Netherlands	3.4	15.2	87.5	21.9
Belgium	8.1	17.9	66.8	7.0
Luxembourg	6.3	17.1	78.3	6.1
United Kingdom	3.4	8.5	118.3	4.4
Ireland	3.5	5.5	184.1	3.1
Denmark	6.4	15.5	119.0	8.2
Greece	0.9	23.5	n/a	n/a

Source: An Bord Bainne 1992

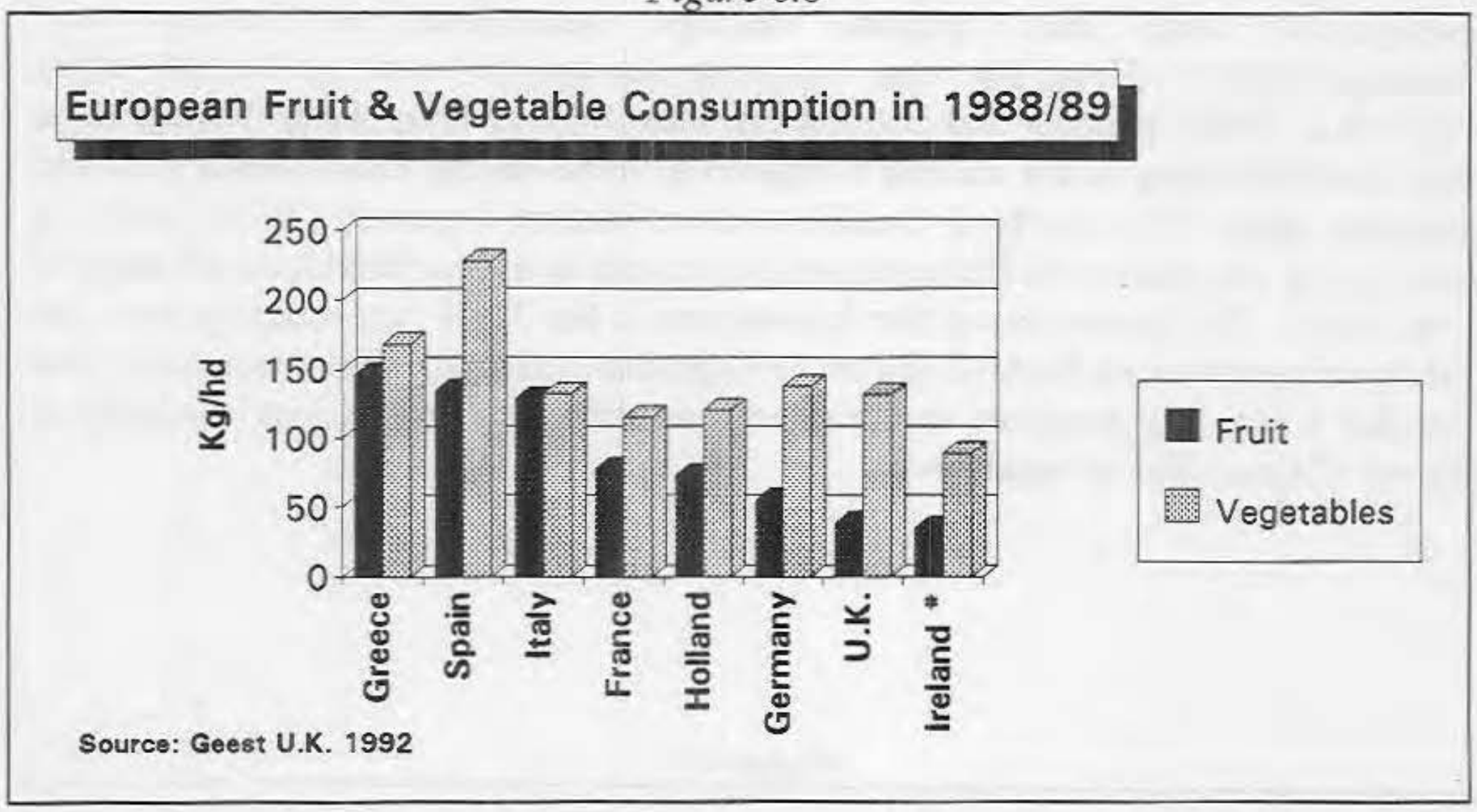
We therefore see marked differences in presentation and preparation of dairy produce, again associated with the relatively new approach to the marketing of a traditional staple.

Figure 6.7



There has been a steady rise in fruit consumption since the early 60s, representing a 46% increase per capita over that period. In absolute terms therefore consumption is increasing.

Figure 6.8



Relative to our European neighbours however, our consumption is still quite low in the case of both fruit and vegetables. The consequences of this in terms of fibre and micro nutrient consumption is discussed further in chapter 7.

Table 6.2 Fruit Consumption in Ireland 1990/91.

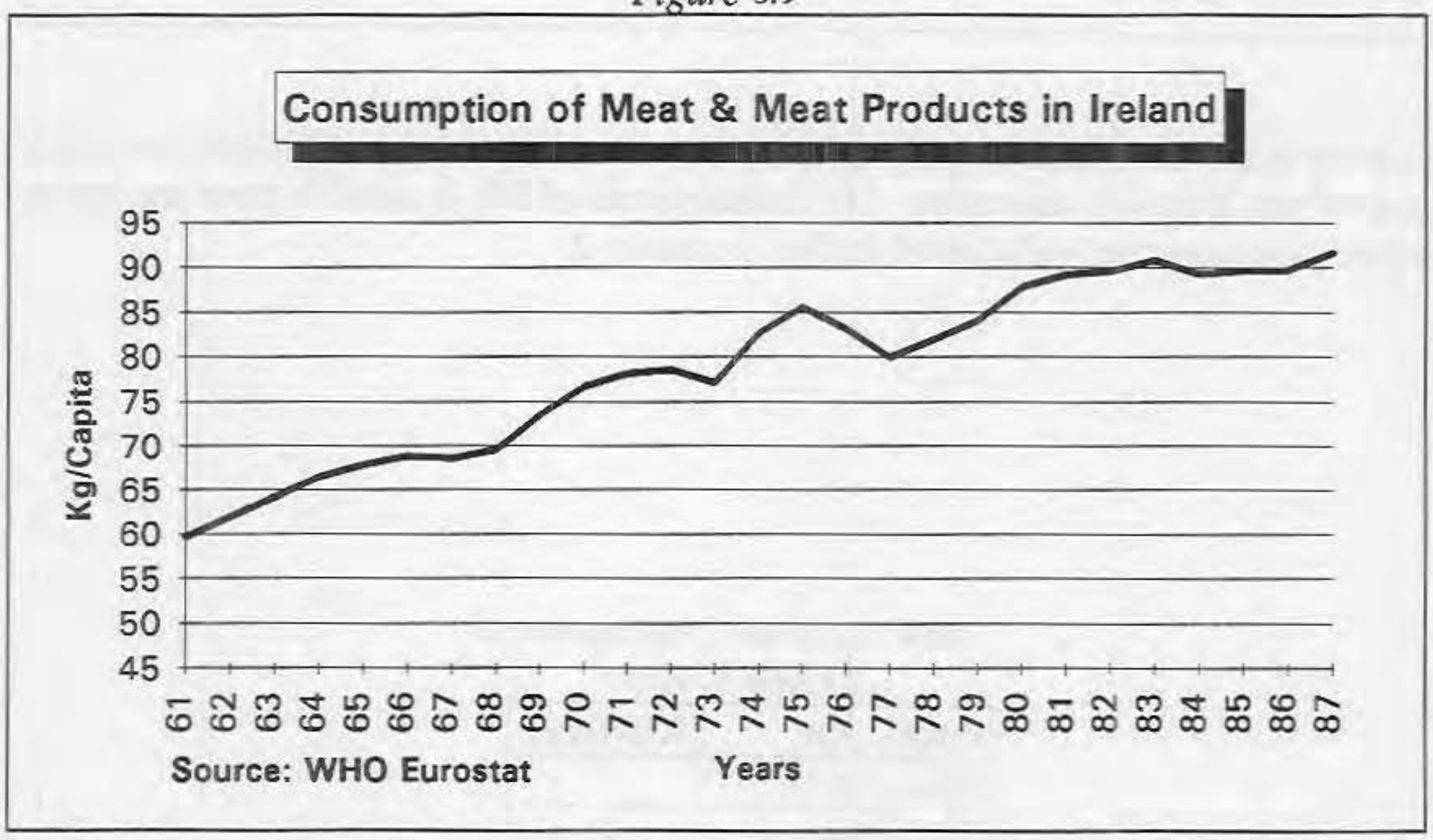
Fruit Type	KG/Head
Apples (Table)	17
Citrus Fruit	15
Fresh Grapes	11
Oranges	10
Tomatoes	6
Cauliflower	3
Dried Fruit	2
Table Pears	2
Fresh Peaches	1
Nuts	1

Source: C.S.O. Food Balance Sheets

Table 6.2 demonstrates the different fruit types consumed, the traditional fruits still dominating.The source of purchase for fruit among Irish housewives is similar to overall purchasing trends, with multiples and supermarkets accounting for 44% of

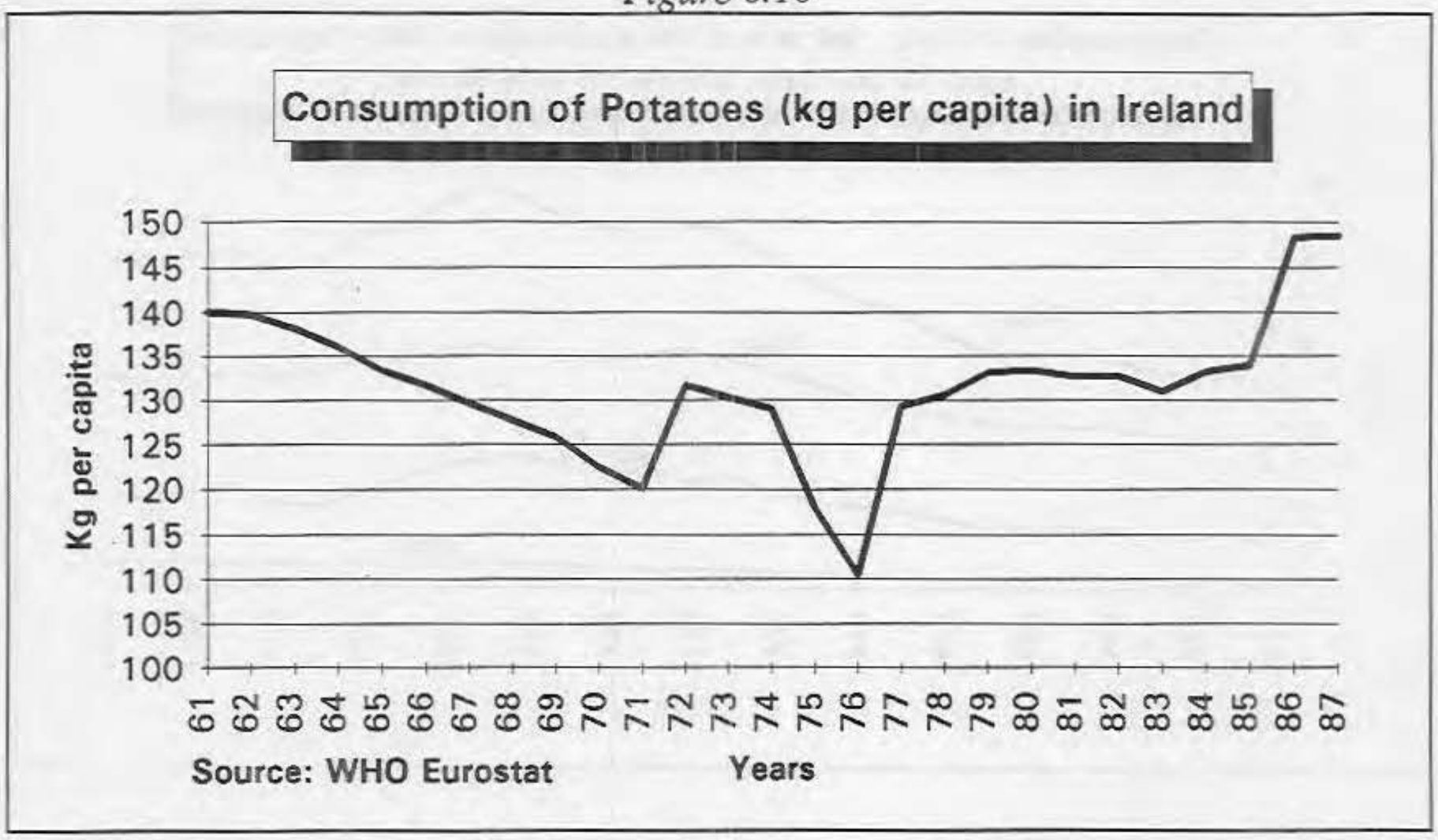
purchases nation-wide (from a high of 66% in Dublin to 17% in Connaught/Ulster). The greengrocers share is estimated at 36%, again exhibiting a regional pattern where greengrocers were most popular amongst housewives in Leinster and Connaught/Ulster. There has been a growing demand for what are termed 'minor crops' (e.g. leeks, peppers and courgettes) with 70% of housewives buying these crops, but this figure is still modest compared to those buying conventional fruit and vegetable types. The An Bord Glas/Lansdowne Market Research (1992) study on herbs, minor vegetables and fruit crops made attempts to assess the volume of usage of these crops. The survey found that housewives in the 35-49 age category from the Dublin area were more likely to buy these vegetables and fruit. The minor fruit types recorded a very low purchase rate in all regions, with rural housewives less likely to buy any of these fruit or vegetables.

Figure 6.9



Per capita consumption of meat products has continued to rise steadily since the 1960s (figure 6.9), but the pattern is more fluctuant for our historical staple the potato (figure 6.10), having dipped in the 1970s.

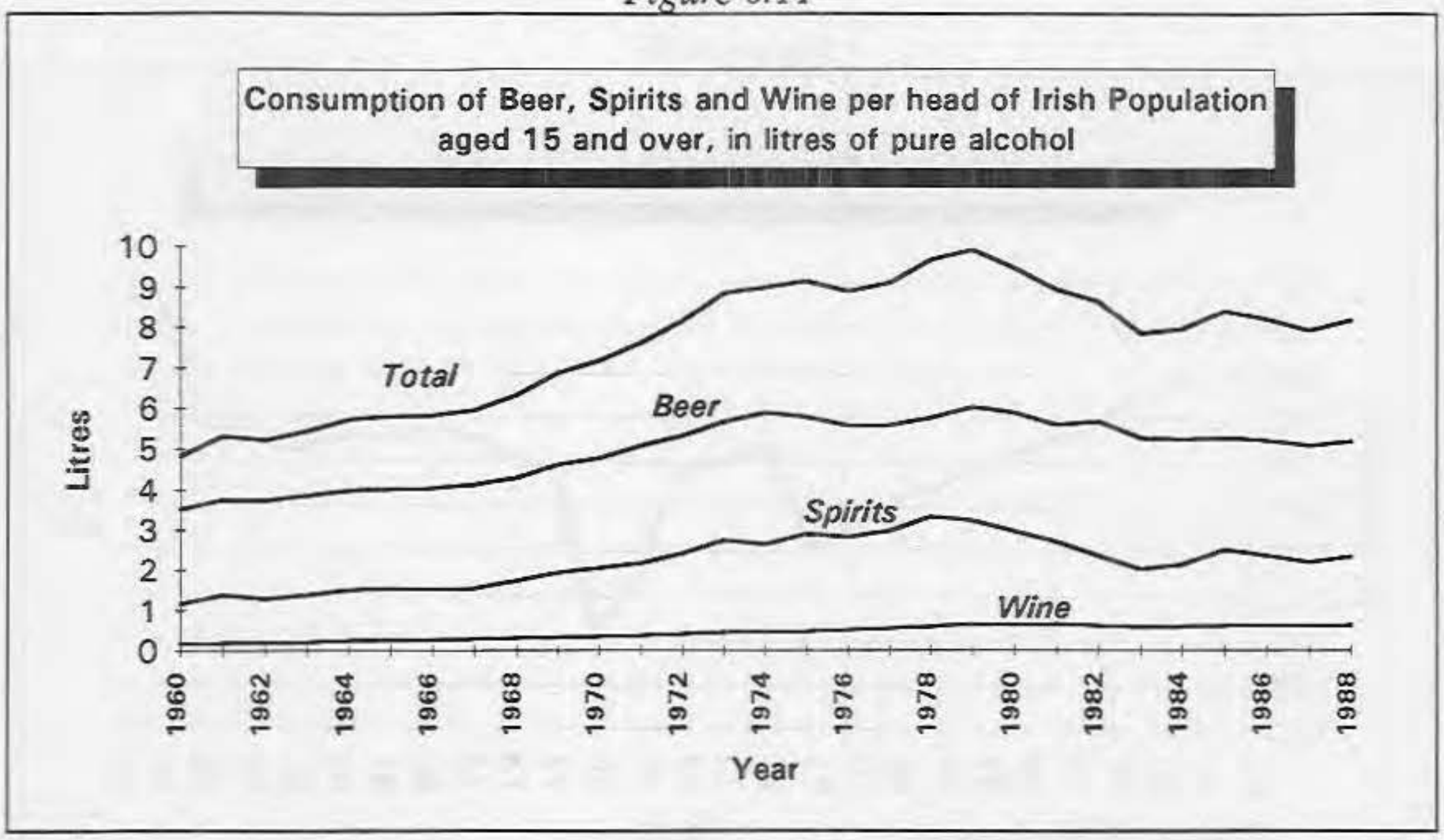
Figure 6.10



The consumption pattern of the potato is seen to be fluctuating over time in figure 6.10 above. Associated with the potato is what is called the 'potato paradox' whereby, probably due to historical reasons, the potato has a low profile as a food item in the Irish diet. Consumption trends of late favour more fashionable sources of starch such as rice and pasta. Countries such as Peru, Bolivia and Mexico on the other hand cultivate many different varieties of potato and employ more varied cooking methods (McNutt 1993)

Over 60% of adults drink alcohol of some description, with 46% consuming beer, stout being the most popular but the figure for lager is nearly on a par. Whiskey continues to be the most popular spirit and wine consumption is increasing also. This is still low in an absolute sense but has increased relatively quite considerably since the 1960s.

Figure 6.11



6.5: Irish Retail Outlet Distribution

We now discuss the number, type and distribution of retail outlets in the country comparing past and present. These figures are available from the Central Statistics Office Census of Distribution from 1951 to 1988.

Table 6.3 Type and Distribution of Retail Outlets 1951 to 1988 (C.S.O.)

Shop Type	***Number of Establishments 1951***	***Number of Establishments 1988***
Grocery	9,387	5,743*
Grocery with Public House	3,526	921
Public House and Wines and Spirits	4,398	7,399
Fresh Meat	1,262	1,690
Bread and Flour Confectionery	194	337
Dairy Products	136	772
Fish and Poultry	108	111
Fruit and Vegetables	400	327
Tobacco,sweets and newspapers	3,682	1,689
Country General Shop	1,025	79

* Includes Supermarkets and Delicatessens.
Source: Census of Distribution 1988

From the above table 6.3, the swing from country general shop to grocery and supermarket is evident with a similar decrease in the tobacco, sweets and newspapers type establishment. From the early 60s to present we have had what is termed a *retail revolution* where both the variety and method of sales have undergone marked change. We have gone from the traditional country general store to a more self service 'pile it high, sell it cheap' type market utilising the electronic point of sale technology (EPOS) e.g. bar coding rather than price tagging. By the mid 1990s it is estimated that nearly 70% of all packaged goods will be sold through EPOS. Both this and a more elaborate 'Electronic Fund Transfer at the Point of Sale' or EFTPOS will enable retailers to link their information on what products are selling to what types of people are buying the products.

A similar sample Census has been conducted by A.C.Nielsen in 1983, 1988 and 1991. The Neilsen Sample Census figures for 1991 are thus the most recent and selected results of the study for the two most recent years are given below (table 6.4).

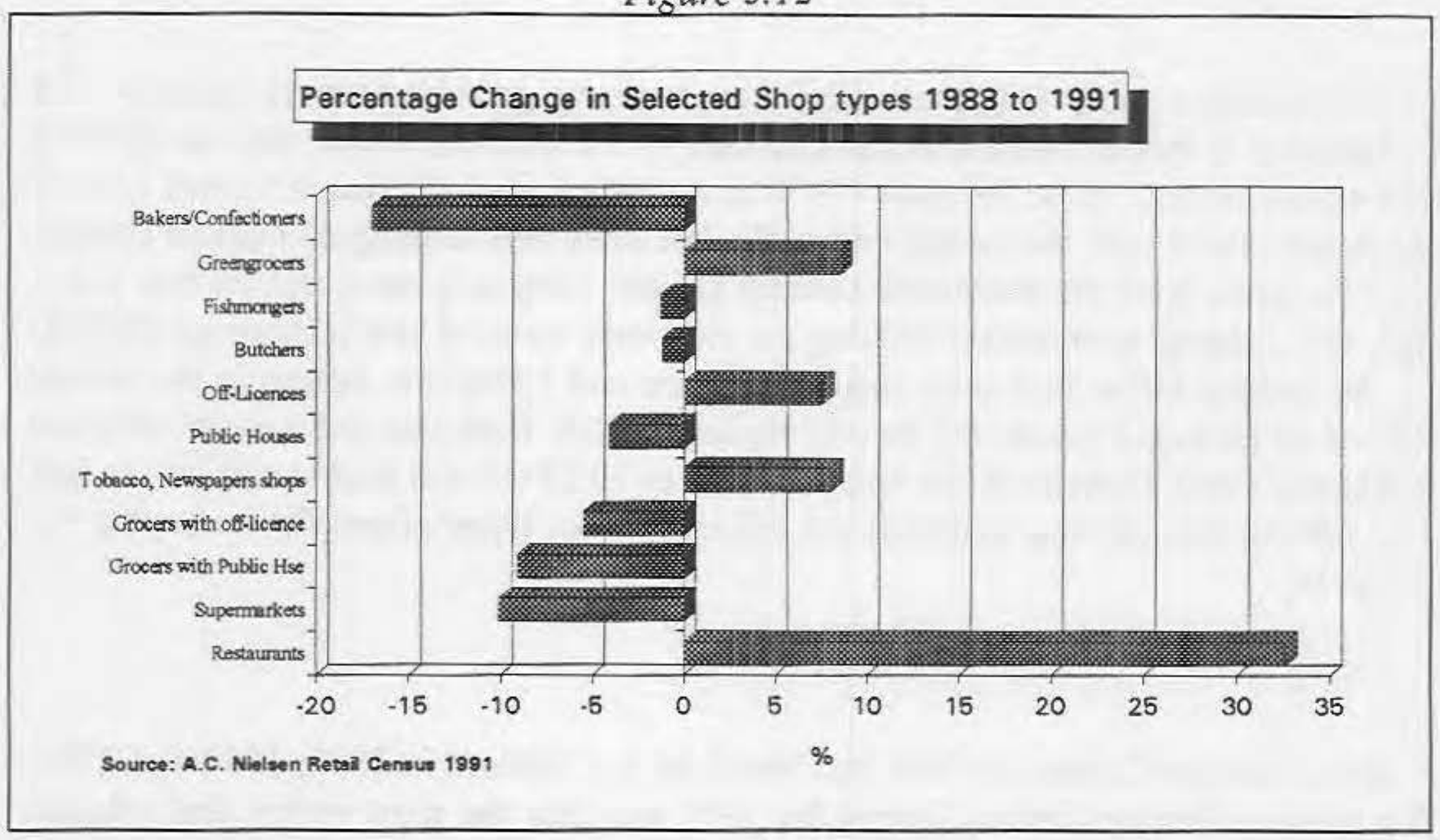
Table 6.4 Type and Distribution of Retail Outlets 1988 to 1991 (Neilsen 1991)

Shop Type	***1988***	***1991***	***% Change***
Supermarket/Grocers	6575	5909	-10.1
Grocers with Off-Licence	596	563	-5.5
Grocers with Public House	677	615	-9.1
Tobacco, Stationery & Newspapers	2822	3050	8.0
Public Houses	7888	7561	-4.1
Off-Licences	132	142	7.5
Butchers	1954	1930	-1.2
Fishmongers	149	147	-1.3
Greengrocers	501	544	8.5
Bakers/Confectioners	506	419	-17.0
Restaurants	1911	2534	32.6

Source: Neilsen 1991

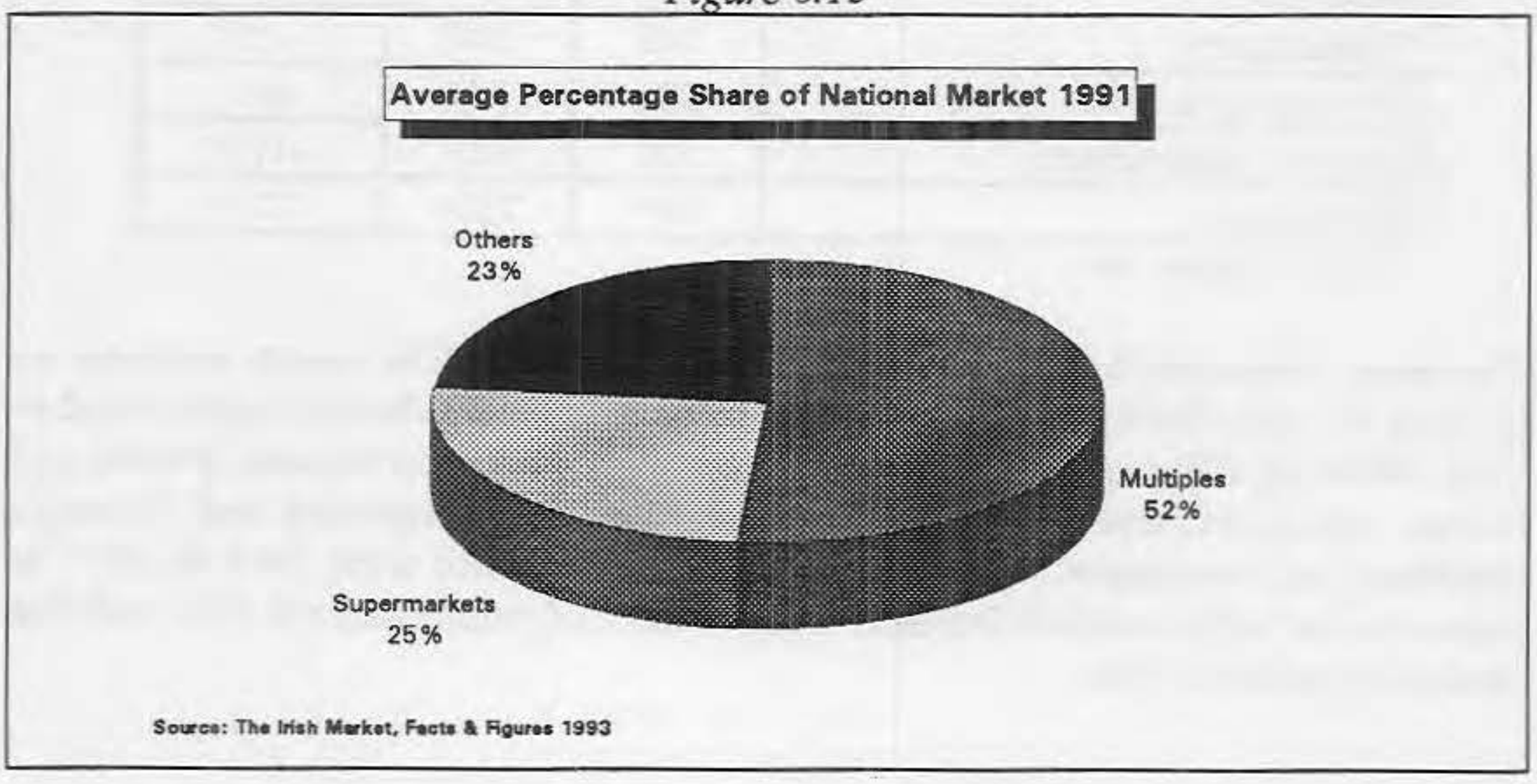
The same phenomenon is apparent in these figures also. The report indicates an increase of about 9% in the total number of retail outlets over the three year period to 1988. With this difference was a decrease in the number of supermarkets, grocers and bakers with an increase in the number of off-licences, greengrocers and Tobacco, stationery and newspaper outlets. The percentage difference from 1988 to 1991 is shown below with a marked increase in the number of restaurants (32.6%) over the three year period to 1991.

Figure 3.12



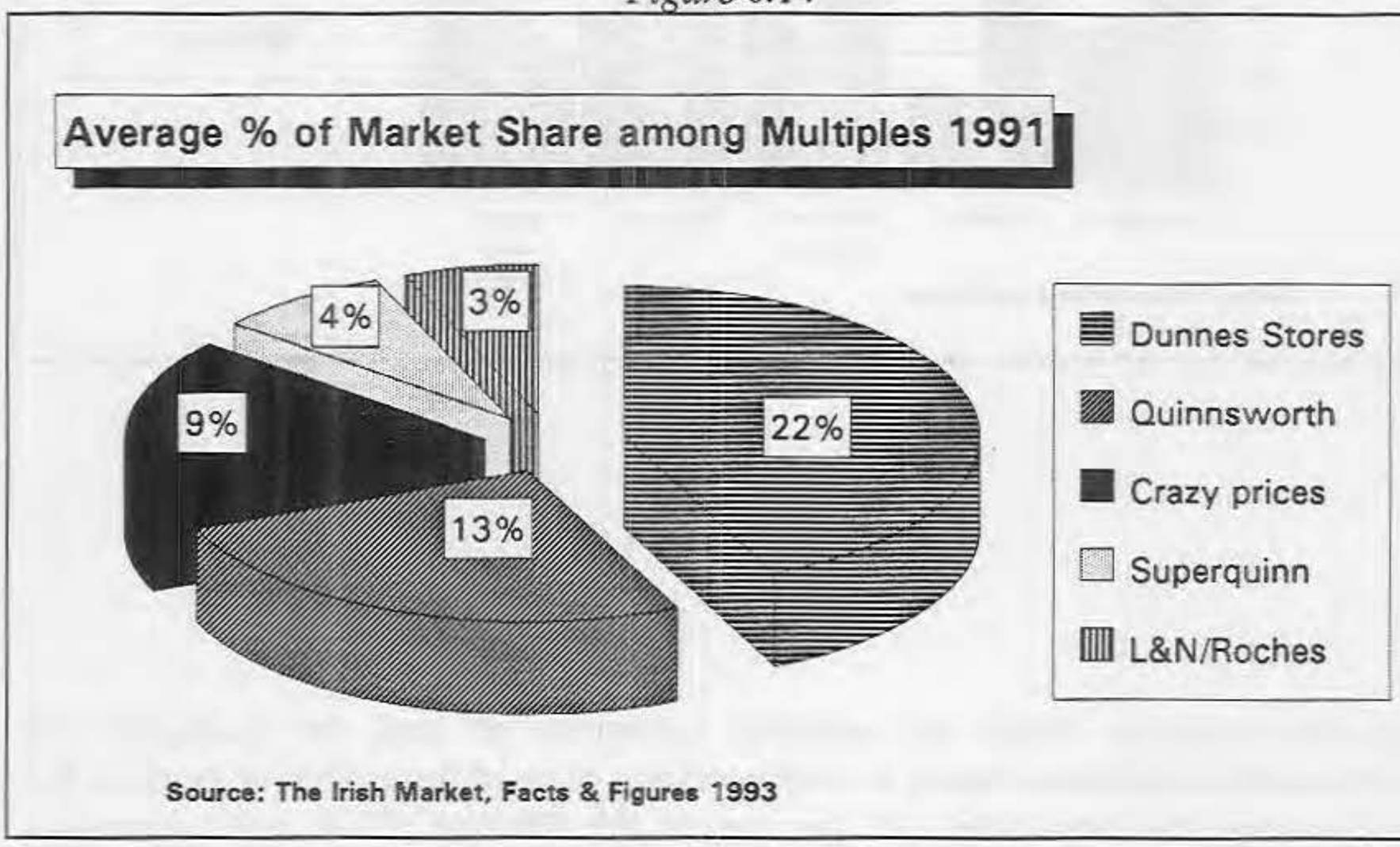
The Grocery trade in Ireland is estimated to be worth about £3.6 billion with the top 2% of outlets accounting for 50% of turnover and the top 5% accounted for 60% of total business. The market share is divided between Multiples (e.g. Dunnes, Quinnsworth etc.), Groups or Symbols (e.g. Centra, Supervalue etc.) and Independents (figure 6.13).

Figure 6.13



The trend since the late 80s has been a 10% drop in the Multiple market share to 50%, a 4% increase in the Symbol share to 25% and a similar increase in the 'others' category. It is estimated that within the multiples the market is divided between the big two of Dunnes and Quinnsworth (i.e. Quinnsworth and Crazy Prices) accounting for approximately 20% each. On a regional basis the multiples account for different market shares in different regions having the biggest share in Dublin.

Figure 6.14

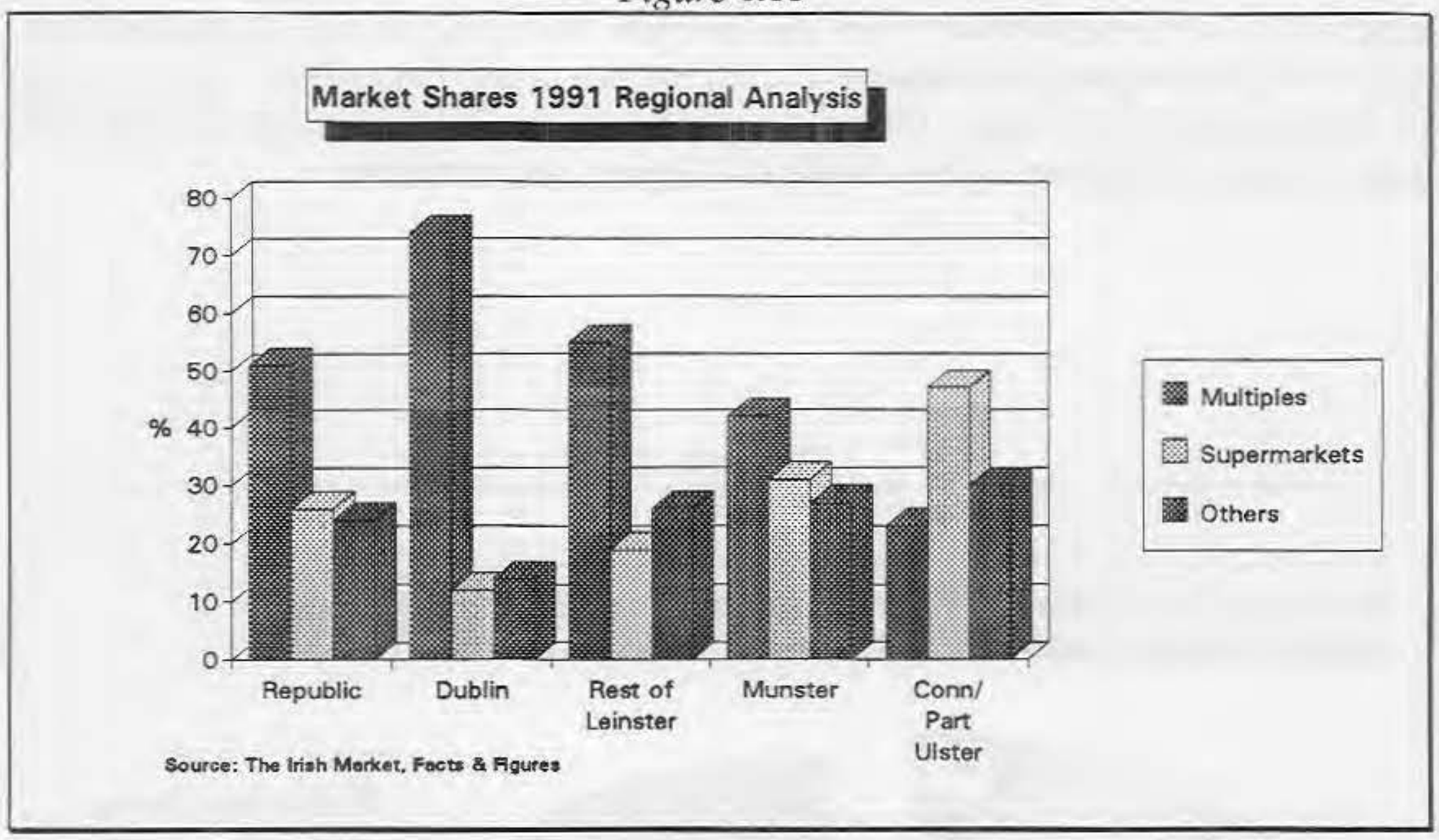


Source: The Irish Market, Facts & Figures 1993

It has been suggested that a small group of buyers are responsible for determining what goes on sale on a wide scale in retail outlets across the country (Cecil 1992). They represent a target group, not only for manufacturers but also for health professionals seeking to change the eating habits of the population at large.

This group of buyers are responsible for negotiating prices and for listing products. They represent a target group, not only for manufacturers, but for health professionals seeking to change the eating habits of the population at large. We have not yet been able to get a response from supermarket chains in Ireland on this issue.

Figure 6.15



Thus the shopping public are primarily customers of both the Multiples and supermarkets in all regions but to a variable extent. Each of these types of markets has what is termed an 'own label'. At the start of the 80's half of all Irish housewives claimed never to have purchased an own label. As the decade proceeded these such brands made rapid inroads with similar studies indicating that 90%, in as early as 1993, had claimed to have purchased an 'own label'. Figures for 1992 indicate a comparable figure of 84% (Wilsen Hartnell 1993). The leading own labels purchased, as would be expected from the analysis of the market share, are St. Bernard, Yellow Pack, Thrift, Homestead and VG/Centra. An interesting fact with this pattern is that it is shown not to be purely a working class phenomenon, with 73% of social class AB claiming to have bought an own label in the past month, with social class DE peaking at 88%. The purchasing motivation cannot be price alone, but is more subtely related to economic practice generally. The urban and rural share are on a par also at or around 83% and 85% respectively. The biggest influence on such purchases is shown to be attributed to family size and age with 88% of under 35 year old housewives and 89% of housewives in homes of 5+ claim to purchase own label regularly. Most recent research indicates that the growth in penetration of own label/generics in the 1980s has levelled off and despite their relatively classless appeal, are particularly favoured by the larger, younger families living in both urban and rural areas (Wilsen Hartnell 1993).

6.6: Nutritional Labelling

Starting during the decade of the 60s, greater emphasis was placed upon the consumer's right to be adequately informed about the products that were being purchased. This 'era of consumerism' was particularly characterised by an increased demand within the general public to know more about the foods that were being bought and subsequently eaten.

As a result, nutritional labelling of food items was adopted as a means of informing the consumer of basic information about the product, i.e. name of the food item, the manufacturer and / or distributor, and the date of packaging. With time, the amount and type of information placed on food labels has increased to include data about energy values and the relative nutrient contributions of protein, carbohydrate and fat. More recently the food label has come to display information about vitamin and mineral enrichment and fortification, fibre and sodium content as well as the type of fat (saturated, mono- or polyunsaturated) in the food item (Thom 1989).

The practice of providing nutritional labelling on food products has become ever more common within the food industry as well as being more widely accepted by consumers. Food labelling is considered an effective and useful measure for health education purposes. As such, greater awareness and more precise levels of information within the general public about the varied relationships between an inadequate diet and certain specific diseases (especially heart disease and certain cancers) has been reached through the presence of food labelling (Kessler 1990).

Given the proliferation of the use of food labels as well as the ever increasing complexity of the same over the past twenty five years, necessary legislative measures within the European Community have been taken to regulate the use of food labels by the food industry. There is some need to insure standardisation of claims being made. Numerous E.C. Directives have been approved which have focused upon both general and specific aspects of nutritional labelling. Among the varied nutritional and food labelling regulations which have been adopted by the E.C. are the following:

* the use of saccharin as a food ingredient.
  (E.C. Commission Recommendation 78 / 358)

* the labelling, presentation and advertising of foodstuffs for sale.
  (E.C. Council Directive 79 / 112)

* the prohibition of certain substances having a hormonal action and of any substances having a thyrostatic action.
  (E.C. Council Directive 81 / 602)

* the fixing of maximum levels for pesticide residues in and on foodstuffs of animal origin.
  (E.C. Council Directive 86 / 363)

* the indication of alcoholic strength by volume in the labelling of alcoholic beverages for sale.
(E.C. Council Directive 87 / 250)

* the food additives authorised for use in foodstuffs intended for human consumption.
(E.C. Council Directive 89 / 107)

* the foodstuffs intended for particular nutritional uses.
(E.C. Council Directive 89 / 398)

* the nutritional labelling for foodstuffs.
(E.C. Council Directive 90 / 496)

The major piece of E.C. legislation which outlined the basic requirements and regulations concerning food labelling was Council Directive 79 / 112. The specific guidelines of this directive deal with the labelling, presentation and advertising of pre-packaged foods that must be labelled with the following characteristics:

* name of the food.

* list of ingredients.

* net quantity (metric).

* date of minimum durability or in the case of highly perishable foods, the 'use by' date.

* any special storage instructions or conditions of use.

* the name or business name and address of the manufacturer, packer, or seller established within the E.C..

* the country of origin, if its absence would mislead to a material degree.

* instructions for use where necessary.

* alcoholic strength for beverages containing more than 1.2% by volume.

* whether the foodstuff has been irradiated or treated with ionising radiation.

This Council Directive specifically states that the food labelling must not be such as to mislead the purchaser by attributing to the foodstuff effects or properties which it does not possess; also disallowed is labelling that suggests a particular foodstuff possesses special characteristics when in fact all similar foodstuffs have the same characteristics, e.g. "No Cholesterol" claims on a non-animal product. Lastly, food labelling is also prohibited which attributes to any foodstuff the property of preventing, treating or curing a human disease (1992 Food Labelling).

A further E.C. Council Directive, 90 / 496 outlines modifications and amendments to previous legislation which concerns food labelling regulations. The major points of this directive are the following:

* nutritional labelling will be voluntary, except in all instances where a nutritional claim (any message or representation relating to nutritional content) would be made, as with labels, advertising or other forms of presentation in which case food labelling is compulsory.

* the only nutritional claims permitted are those which refer to the energy or caloric value of the food item as well as to the content of protein, carbohydrate, fat, fibre, sodium and certain vitamins and minerals.

In all instances where nutritional labelling is provided, the information shown on the product shall consist of one of two types of presentation. These are as follows:

* Group One
  a) energy value

  b) the amounts of protein, carbohydrate, and fat

* Group Two
  a) energy value

  b) the amounts of protein, carbohydrate, sugars fat, saturates, fibre and sodium.

In accordance with Council Directive 90 / 496 a gradual 'phasing in' of the nutritional labelling regulations will be conducted over the coming years. The table below outlines the nutrients which will need to be declared and the target dates for the implementation of the food labelling amendments. The initial changes which come into effect in October 1993 through 1995 deal with Group One nutrients, i.e. energy, protein, carbohydrate and fat. A second phase of implementation of the amendments will commence in October 1995 and these will refer to food labelling claims made

concerning the 'plus four' nutrients, i.e. sugars, saturates, fibre and sodium. Plans exist to evaluate this type of nutritional labelling by 1998 so as to adopt a compulsory system of food labelling which would reflect further steps towards greater integration amongst the member states of the E.C.

Table 6.5 Nutrition Labelling Regulations within the E.C.

Food Claim Reference	**Nutrient(s) to be declared**	**Date of implementation**
One or more of: Group One Nutrients	Energy, Protein, Carbohydrate, Fat	October 1993
One or more of: Group Two Nutrients (Sugars, Saturates, Fibre, Sodium)	Energy, Protein, Carbohydrate, Fat plus named Group Two nutrient	October 1993 until 1995
One or more of: Group One plus Group Two Nutrients	Energy, Protein, Carbohydrate, Sugars, Fat, Saturates, Fibre, Sodium	October 1995
One or more of: Starch, Polyols, Mono- and Polyunsaturates, Cholestrol and all Vitamins and Minerals	Group One and Group Two nutrients plus other named nutrient(s)	October 1993
Mono- and Polyunsaturates, Cholestrol	Named nutrient(s) plus Saturates	October 1993

Source: Commission of the European Communities. Council Directive 90 / 496 / EEC, 1990.

Difficulty in reaching agreement on how nutrition information should be supplied can be attributed to the different roles being assigned to nutritional labelling.

* Nutritionists view labelling as a way of supplying information about a food, intended to be used in the planning of the total diet, and also a way of raising awareness about the subjects diet and health.

* Marketeers view labelling as a way of supplying information about a food, to differentiate it from similar and/ or substitutable products.

*Regulators view labelling as a way of promoting awareness about the subject of diet and health and also a way of ensuring that claims about a product are realistic.

* Consumers view labelling as a way of avoiding or obtaining certain nutrients perceived as undesirable or desirable.

Thus nutrition labelling is being expected to act
1. as a source of information.
2. and/or as a guarantee.

Chapter Seven

Dietary Intake of the Irish Population

7.1: Introduction

This chapter summarises available data on dietary intake of the Irish population, both presently and in comparison with previous surveys. Because of the methodological difficulties and the labour intensive nature of this type of data collection, comprehensive information is not easily available. We will be referring particularly to the last major survey undertaken on a National scale, in 1989 and to its predecessor, more than 40 years before.

7.2: The National Nutrition Survey

The National Nutrition Survey was conducted in 1989 by the Irish Nutrition and Dietetic Institute to provide up to date information on the Irish diet, both food and nutrient intakes, across the age range and for selected subgroups in the population. The principal results were published in 1990. It is understood that further more detailed analysis is underway. However it is to be noted that it is already 4 years since data was first collected.

The total sample number was 1214 people with an age range from 8 years to over 60. The method of survey employed was the 7-day diet history, and a photographic atlas of foods commonly eaten in Ireland was used to help quantify usual portion sizes. Table 7.1 shows the average daily intake of the main nutrients. A table of recommended dietary intakes is to be found in Appendix A1.

Table 7.1 Average daily intake of the main nutrients.

	Energy Kcal.	MJ	Protein g.	% Protein energy	Fat g.	% Fat energy	CHO g	CHO energy	Fibre g	Iron mg	Vit C mg
Males	3035	12.7	112	15	123	36	363	49	20	15	79
Females	1840	7.7	72	15	73	36	230	49	17	10.8	76

Source: National Nutrition Survey 1990

7.3: Total Fat Consumption

Average fat consumption was described as close to the target of 35% of food energy for the adult population. However 71% of women and 60% of men were above this figure, so this must reflect considerable range and variability within the population, particularly for some sub-groups. In particular young to middle-aged males were consuming high levels of fat. It was also not possible to establish the ratio of polyunsaturated to saturated fat consumption because of a lack of relevant information on the composition of a number of foods.

Figure 7.1 shows the major sources of fat in the Irish diet. In the absence of a more detailed breakdown, it is assumed that a considerable proportion of the fat is likely to be saturated from information on food sources of fat.

The traditional sources of animal products are recorded. However, the contribution of 'hidden fat', such as that associated with confectionery and with (presumably) potato preparation, is noteworthy.

Figure 7.1

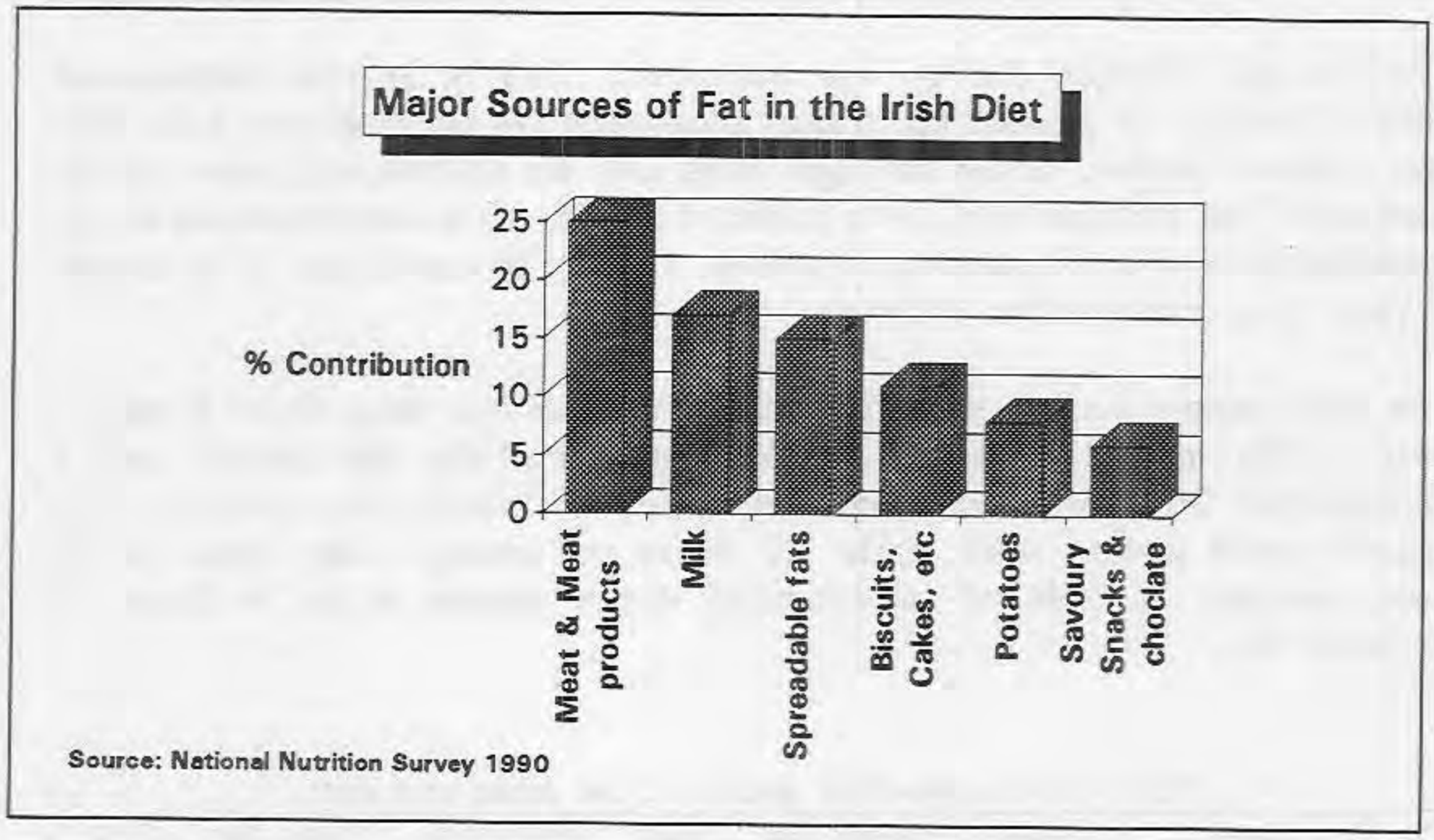


Table 7.2 shows the percentage food energy from fat as age increases. It can be seen that the highest percentage of food energy derived from fat were males in the 25-40 age group and females in the 18-25 age group.

Table 7.2 Percentage food energy (%) from fat as age increases.

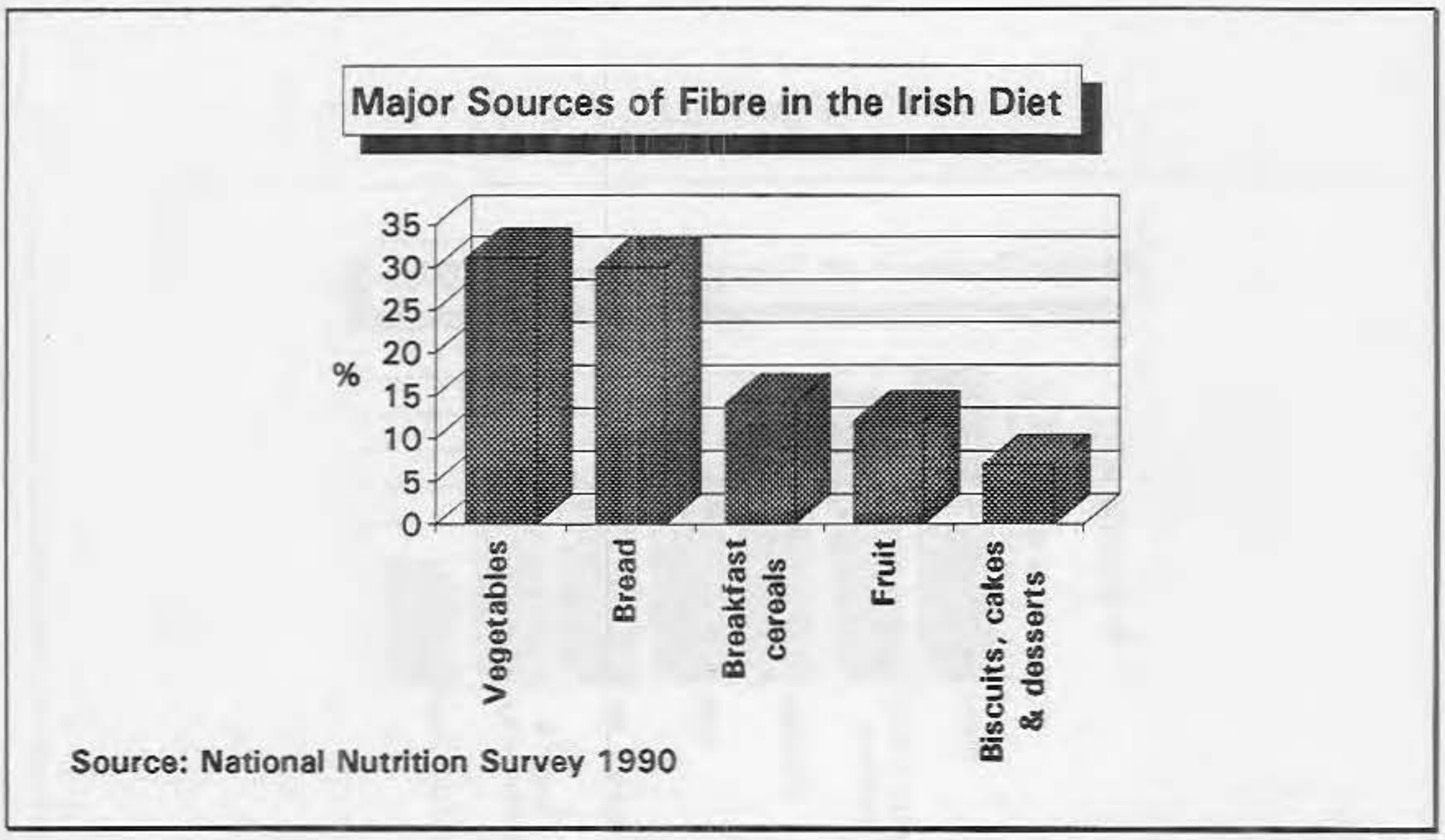
	18-25 yrs	25-40 yrs	40-60 yrs	60+ yrs
Males	35.5	36.2	34.3	33.4
Females	36.4	35.3	34.9	33.8

Source: National Nutrition Survey 1990

7.4: Fibre intake

The recommended fibre intake is 25- 35g per day. Average fibre intakes for both men and women fell below the lower point of the range. Figure 7.2 shows the major sources of fibre in the Irish diet. Within the vegetable category, potatoes provided 11% of the fibre, pulses 10% and other vegetables 10%. After vegetables the next major source of fibre was bread, followed by breakfast cereals.

Figure 7.2



7.5: Intake of Iron and other Micro-nutrients

The iron content of Irish females' diet is lower than the recommended intake. In addition to low iron intakes, females aged 15 -25 years also had relatively low intakes of Calcium, and high intakes of fat (table 7.3).

Table 7.3 Iron, fat and calcium intake for females aged 15-25 with recommended daily allowances (RDA).

	15-18 yrs	RDA	18-25 yrs	RDA
Iron mg	11.6	14	10.8	14
Ca mg	950	800	927	800
% Fat	37.1	35	36.4	35

Source: National Nutrition Survey 1990

7.6: Body Weight and Energy Intake

The National Nutrition Survey found that 53% of the adult male population and 33% of the adult female population were overweight, with an additional 10% of males and 15% of females classified as obese. (To achieve an ideal body weight it is recommended to adjust energy intake while maintaining a physically active lifestyle). Obesity as a risk factor is discussed further in the chapter on health status.

Figure 7.3

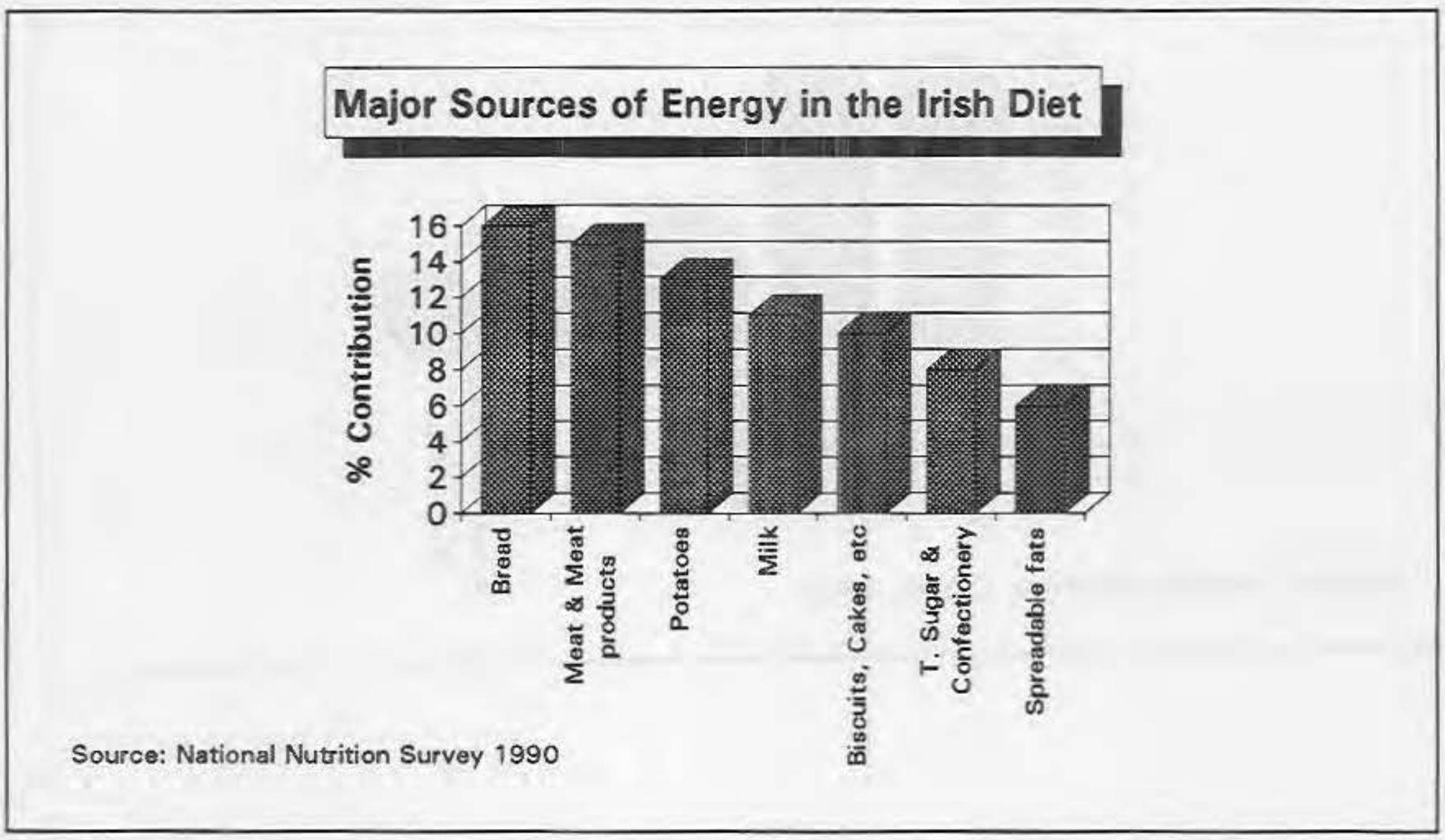
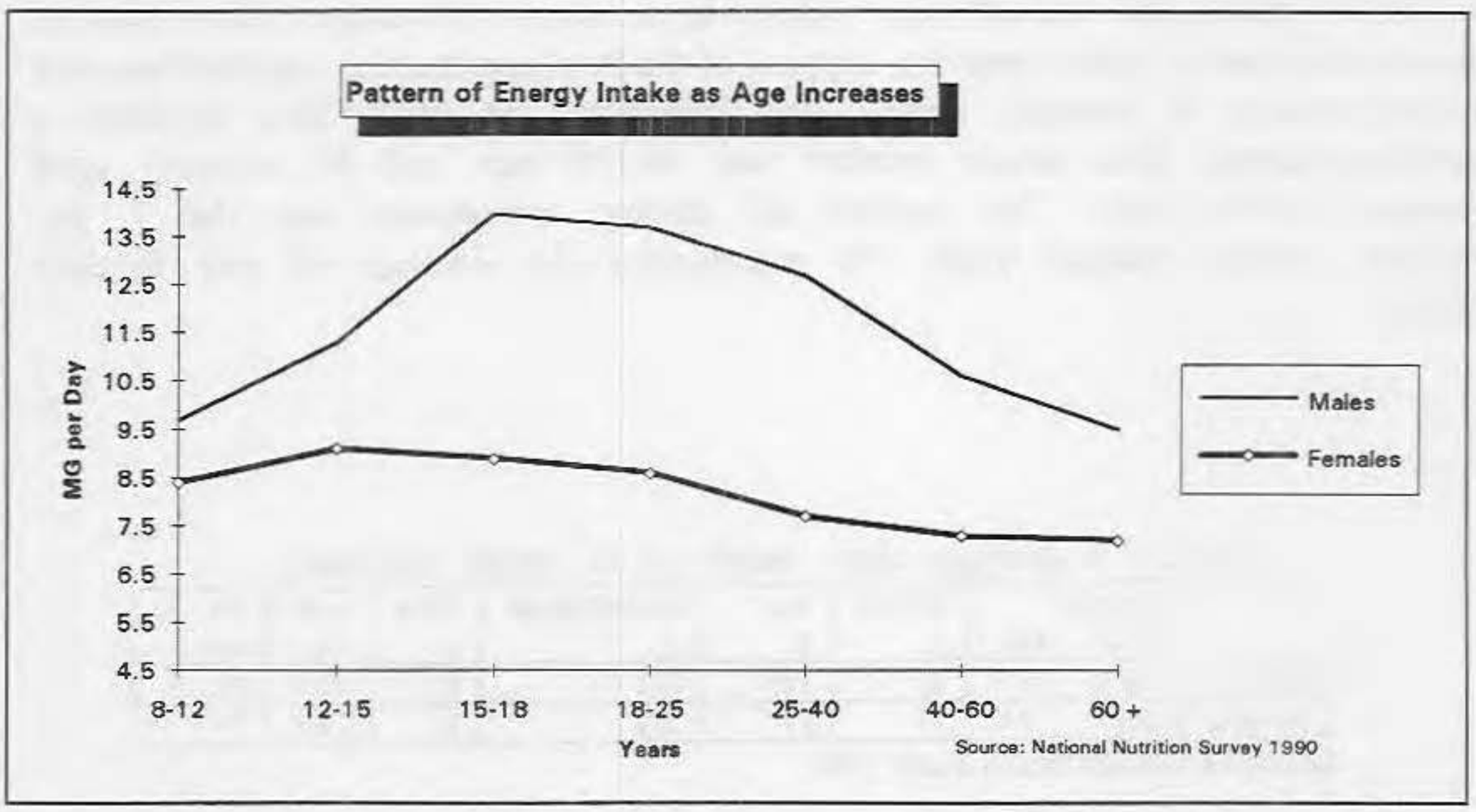


Figure 7.3 shows that the 4 main staples in the Irish diet i.e. bread, meat, potatoes, and milk, contribute to 55% of the total energy intake. Biscuits, cakes, etc. table sugar and confectionery, contribute to 18% of the total energy .

The 1990 National Nutrition Survey showed that the general trend is for males to increase their energy intake between ages of 8 and 18 years, while the increase for females is only marginal. See Figure 7.4.

Figure 7.4



7.7: Alcohol

Alcohol consumption was highest in 18-25 year old group at 23g/day for males and 6g/day for females. This consumption had more than halved by 60 years of age and on average women's intake was only 1/4 that of men in each age group (see table 7.4).

The percentage of energy intake from alcohol was highest in the 18-25 yr olds (5%) of total energy, as compared with the female value of (2%) for this age group.

Table 7.4 Alcohol consumption and energy intake for males and females.

Age Groups	Alcohol Consumption (g)		% Energy from Alcohol	
	Males	Females	Males	Females
18-25	23	6	5	2
25-40	17	6	4	2
40-60	15	4	4	1
60+	10	2	3	1

Source: National Nutrition Survey 1990

7.8: Findings of Kilkenny Health Project

The Kilkenny Health Project was a 5 year health intervention project that began in 1985 and continued until 1990. It was a community based programme that aimed to reduce the risk of heart disease by a variety of strategies which included the statutory and voluntary sectors, support of the local commercial organisations and media publicity. A baseline survey was conducted in 1985. This included a nutrition survey. The sample number was 60 (30 men and 30 women) aged between 35-44 years. The method of dietary assessment was the 7 day weighed intake method. Table 7.5 summarises the findings of this baseline survey.

Table 7.5 Average daily intake of the main nutrients.

	Energy Kcal.	MJ	Protein g.	Fat g.	Carbohydrate g	Fibre g	Iron mg	Vit C mg
Males	2987	12.5	107	119	344	21	13.1	89
Females	2007	8.4	77	87	232	15	10.3	73

Source: Kilkenny Health Study 1985

These findings are consistent with those reported in the INDI Survey. As in the National Nutrition Survey, the Kilkenny Health Project baseline study also reported higher than desirable fat intake and overweight levels (48% overweight with an additional 16.4% in the obese category) in those surveyed. Females also had low iron and fibre intake. The findings of the 7-day weighed dietary intake were used when planning nutrition education programmes in Kilkenny.

7.9: Young People's Dietary Intake

A further study 'Young People and their food choices' (Cunningham 1993) examined the eating habits of a random sample of 500 12-15 year old children, both boys and girls. This showed that a number of pupils, mainly rural boys, were selecting high fat meals (e.g.. chips, burgers & chips, fish & chips) every day at lunchtime.

From the period after the evening meal until bedtime an average of 6 snacks - usually high in fat and sugar, were consumed. Sugar consumption was directly related to the degree of snacking and could lead to dental decay. The 1990 National Nutrition Survey had earlier shown that the consumption of biscuits, cakes, and desserts was highest in males aged 15 -18, while the consumption of both sugar and confectionery was highest in the 12-15 age group in the case of males and females (Figs 7.5 and 7.6).

Figure 7.5

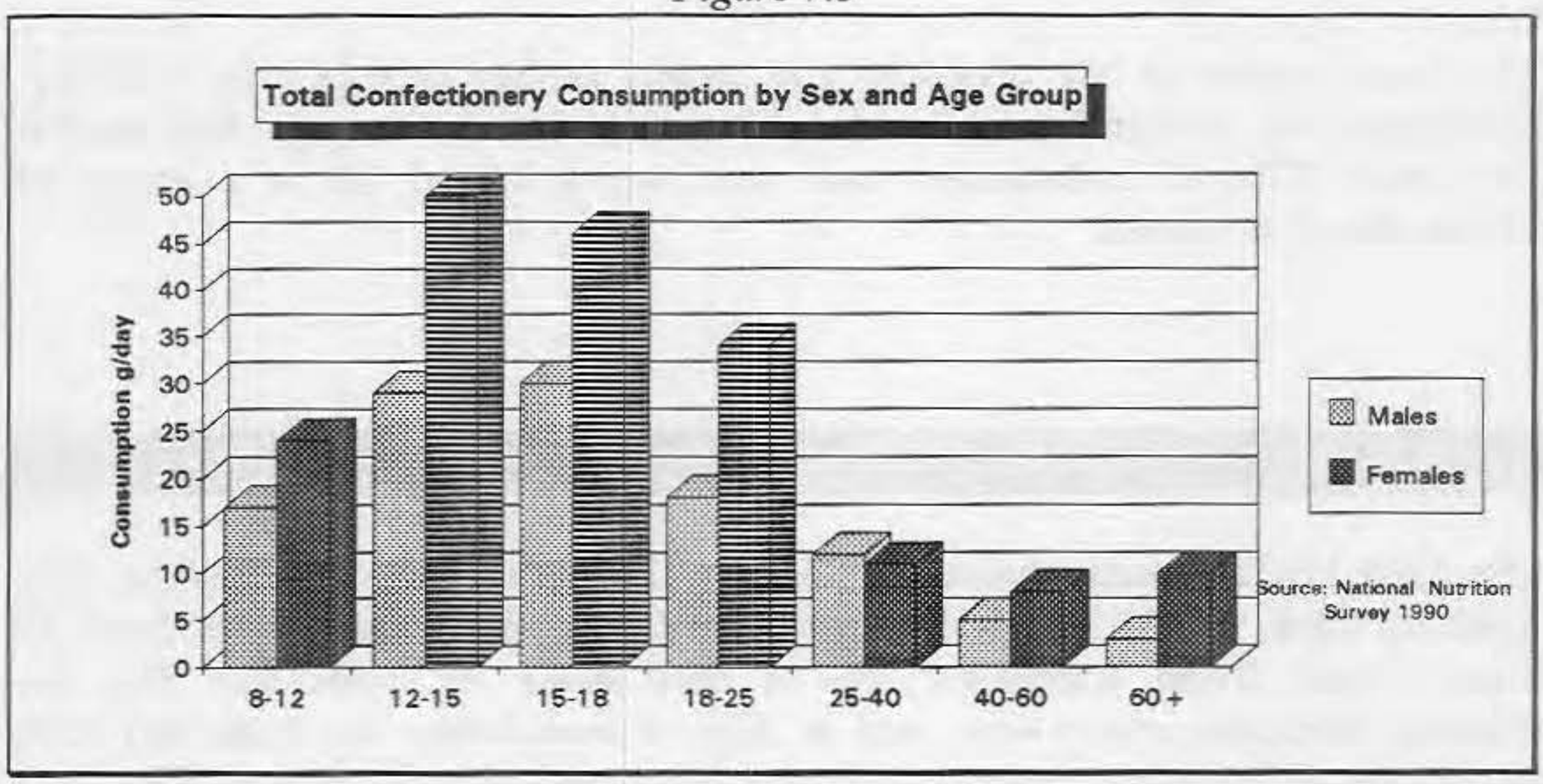
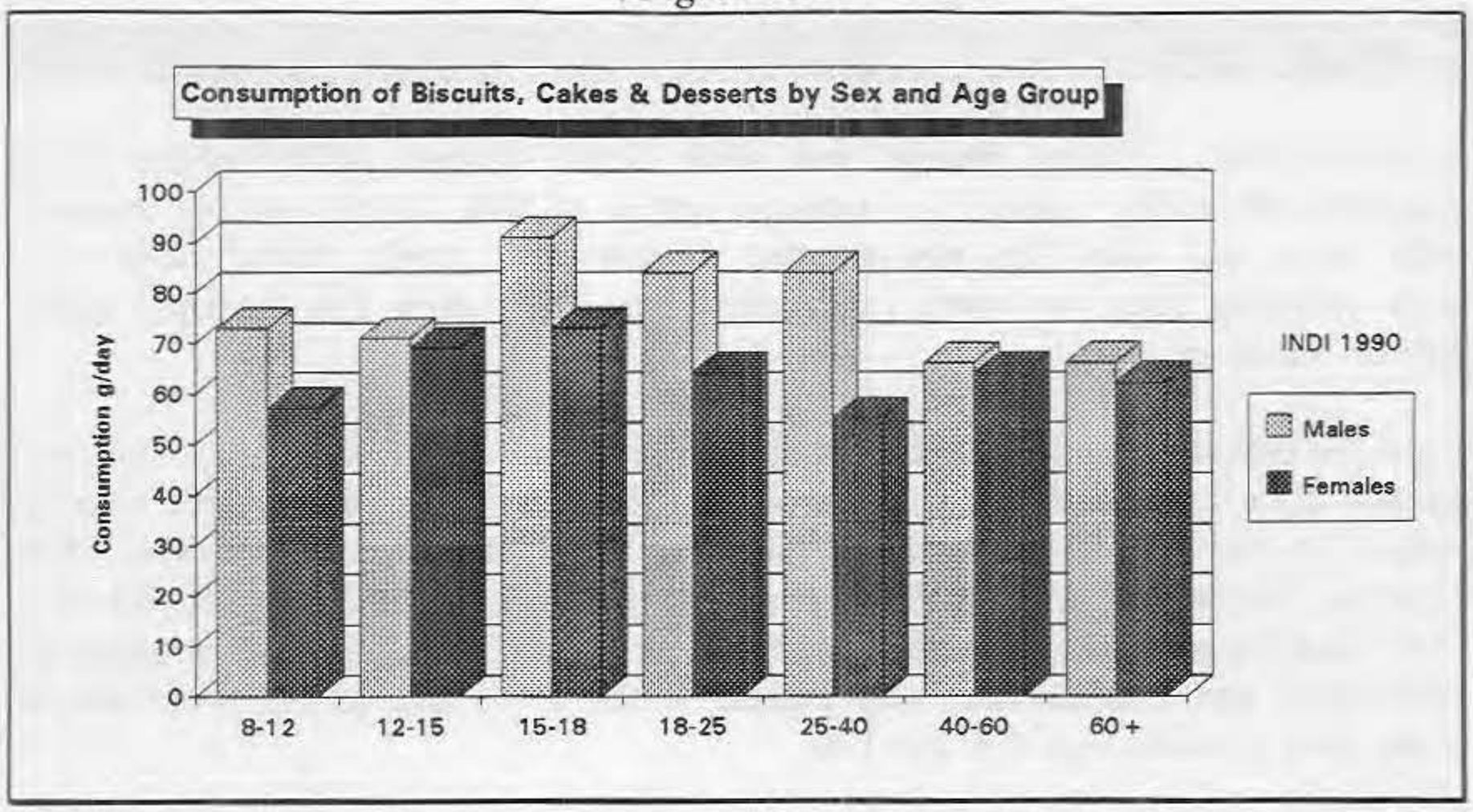


Figure 7.6



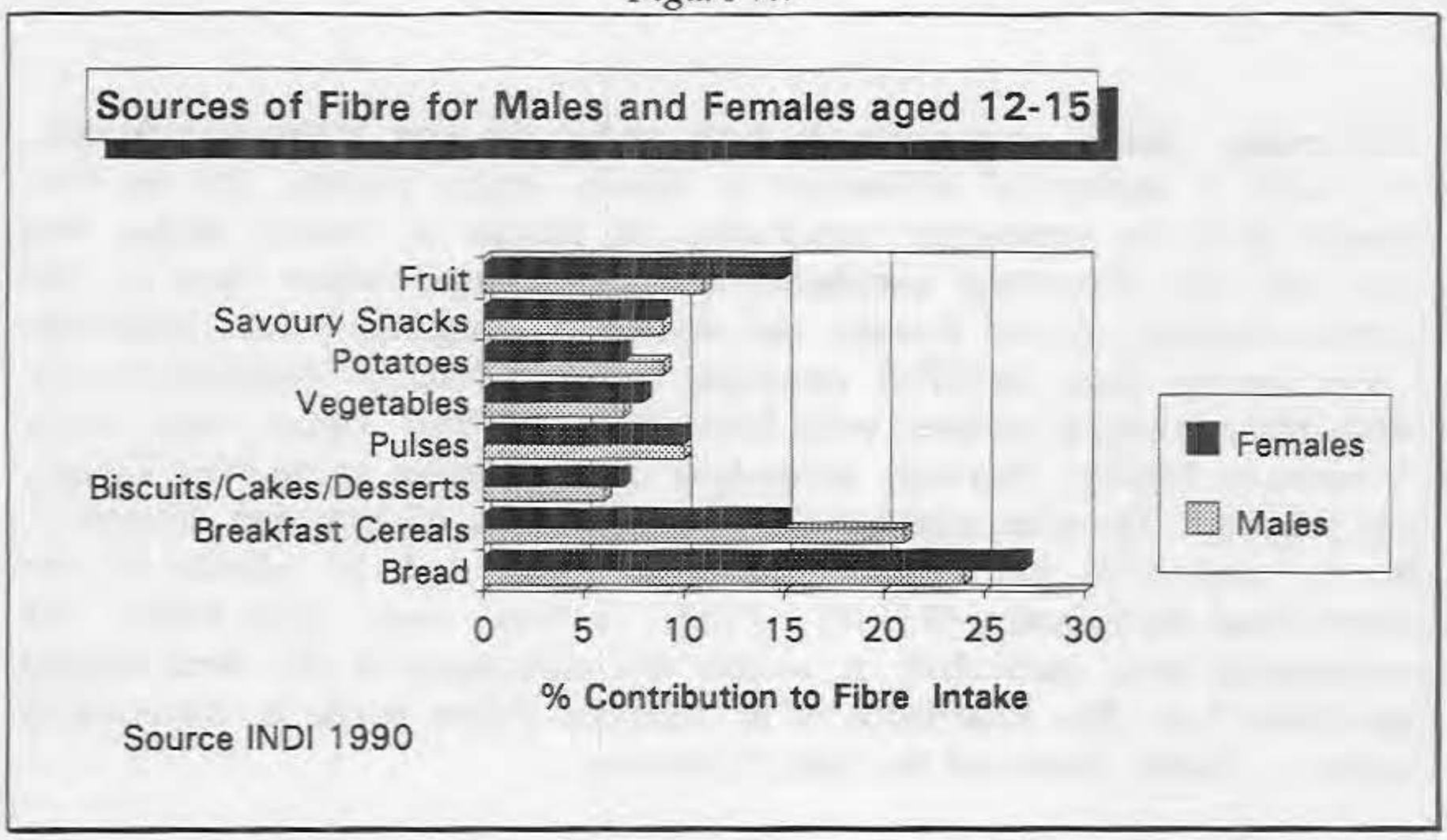
Source: National Nutrition Survey.1990.

The latest review of the chocolate and sweets market published by Cadbury-Schweppes and Trebor-Bassett in the U.K. shows that the average Irish person eats about 27lbs of confectionery each year putting Ireland 5th in a league of 17 developed countries.

7.10: Fibre

The 1990 I.N.D.I. study showed that in the 12-15 age group the average daily intake of fibre was 19.7g/day. Both males and females preferred white bread to brown bread. Bread contributed 24% of fibre intake for males and 27% for females. Breakfast cereals were next at 21% of fibre intake for males and 15% for females, followed by fruit at 11% for males and 15% for females.(Fig 7.7.) The Cunningham study 1993 showed that Cornflakes, Weetabix and Porridge were the most popular breakfast cereals with Porridge being more popular with rural children.

Figure 7.7



7.11: The Relationship Between Diet and Socio-Economic Status

A study of the patterns of food and nutrient intake in a suburb of Dublin with chronically high unemployment , West Tallaght, was carried out in 1989 (Gibney and Lee). The method of dietary assessment was the diet history of a typical 7 days in a recent month. Food intakes were measured using household measures and using volumetric models. These findings in turn may be compared with the National Nutrition Survey.

Table 7.6 Comparison of mean daily nutrient intakes of males and females in West Tallaght and National Nutrition Survey.

	Tallaght		**NNS**	
	Males	Females	Males	Females
Energy	13.1MJ 3131 Kcals	8.5MJ 2031 Kcals	12.7MJ 3035 Kcals	7.7MJ 1840 Kcals
Protein g	100	64	112	72
Fat g	128	81	123	73
Carbohydrate g	409	275	363	230
Fibre g	22	14	20	17
% Protein Energy	13	13.5	16	15.9
% Fat energy	38.2	37	38	38
% Carbohydrate energy	48.7	49.6	46.4	47.4
Iron mg	13.5	8.1	15	10.8
Calcium mg	1233	905	1145	853
Vitamin A mg	1507	1070	1357	1273
Vitamin C mg	59.7	44.8	79	76
Vitamin B6 mg	1.5	1	2	1.4
Folate mg	211	137	218	175

Source: INDI 1990, Combat Poverty Agency 1989

While energy intakes were similar in both studies for both males and females, there were a number of differences in dietary intake patterns. In the West Tallaght study, the percentage contribution of protein to energy intake was lower and the percentage contribution of carbohydrate higher than in the National Nutrition Survey. Females also obtained a marginally lower proportion of their energy from fat (37%) compared with the National Nutrition Survey (38%). More strikingly however, while fibre intakes in both studies were below the minimum 25g/day, they were particularly low in females in the West Tallaght study (14g/day). The same women had very low intakes of Iron and Vitamin C, both in relation to the National Nutrition Survey and in relation to the recommended daily intake (R.D.A). Folate intakes were also below the recommended level, particularly in women and particularly in the West Tallaght study (table 7.6) The importance of an adequate Folate intake is discussed in Chapter 3. Health Status of the Irish Population.

One of the socio-economic groupings studied in the National Nutrition Survey was the unemployed. Although the number of people in this group was small (30 males and 11 females) similarities were seen in their intake of nutrients with those of West Tallaght. e.g.. low fibre, iron, vitamin C and folate in females; in males low fibre and fat intake exceeded the recommended value of 35% of energy intake.

A study by Clark (1993), for the Western Health Board, assessed the dietary intake of mothers, and children aged 8-12 living on low incomes in Galway cities. The results of the study showed that while the children's diet was adequate, nutrient intakes for mothers were low in respect of energy, fibre, calcium, iron and folate. Mothers freely admitted that they neglected their own diets in favour of the children's diet.

A study of nutritional status of the elderly on the at risk register kept by public health (Fogarty, Nolan 1988) showed that rural and urban elderly people both had an inadequate diet in all cases except ascorbic acid and vitamin A, the rural subjects fared worst. Future studies should ideally investigate a representative sample of elderly people to see if these differences are generally the case.

7.12: Comparison of Children's Diets

Children's diets were also studied in both the National Nutrition Survey and West Tallaght study.

Table 7.7 Mean daily nutrient intakes in children aged 7-11 years in Tallaght and aged 8-12 years in the National Nutrition Survey (NNS).

	Tallaght Boys	NNS Boys	Tallaght Girls	NNS Girls
Energy	10.5MJ 2510 Kcals	9.7MJ 2318 Kcals	8.8 MJ 2103 Kcals	8.4 MJ 2007 Kcals
% Energy from Fat	34.9	36	34.2	35.8
% Energy from Carbohydrate	52.7	50.1	52.7	50.6
% % Energy from Protein	12.3	13.8	13	13.6
Fibre g	19	16.7	18	14.5
Calcium mg	1269	1227	1141	1039
Vitamin C mg	46.4	70.7	54.3	59.3
Iron	10.6	12.9	9.1	11

Source: INDI 1990, Combat Poverty Agency 1989

Close comparisons must be limited as the age groups do not match exactly, however the differences in findings are small. In both studies most nutrient intakes were similar for both sexes. The main exception was vitamin C, which was higher for girls in West Tallaght and higher for boys in the National Nutrition Survey. Relative to the R.D.A.s , iron intakes were low particularly in girls in both centres. In West Tallaght Vitamin C intakes were low relative to the RDA and of course fibre content of both diets was below the minimum recommendation of 25g.

A school nutrition survey was carried out in Longford/Westmeath County Council in 1990 (O'Connor et al 1993). 456 children aged between 8 to 12 years participated in this survey of food eaten at school. Of all the food items eaten as a snack 48.6% were categorised as junk. 75.8% of the sandwiches brought to school for lunch were made with white bread. Of the remaining food items brought for lunch, 63.5% were of the junk variety. The authors recommended the development of school food policies, the improvement of the quality of school food by issuing parents with leaflets showing a range of healthy options and the education of children and their parents from an early age on the importance of a balanced diet.

7.13: Dental Health in Children

A study of children's dental health was carried out in County Clare in 1990. The study included oral health practices.

Table 7.8 Frequency of sweet snacks between meals (8 year olds)

	n	%	DMFT	% Caries free
Once a day or less	150	54	0.8	63
Twice a day	78	28	0.9	51
Three times a day or more	36	13	1.0	50
Don't know	15	5	-	-
Total	279	100	0.9	53

Snacking habits were such that 41% had sweet snacks twice a day or more although 99% of parents apparently knew that eating sweet foods or drinking sweet drinks regularly can be harmful to a child's teeth. The difference between what is known about the cause of caries and children's actual dietary patterns demonstrates the difference between knowledge and practices with regard to health behaviour.

7.14: Infant Feeding Practices

In 1982 an Irish Health Education National study researched infant feeding pattern in Ireland. It showed that the incidence of breast feeding in Ireland, at 29% , fell far short of the figure of 67% reported in the U.K (McSweeny & Keavney 1981). A study was also carried out in the West of Ireland in 1987 on a population of 877 mothers over a 5 month period. This showed that 63% of mothers delivering in the University College Hospital Galway bottle-fed and 36% breast-fed. Convenience was the main consideration in determining choice of feeding, followed by past experience. Of the 36% of mothers who breast-fed, up to 10% of the total were still doing so 5 months later (Lowry) .

Barker et al (1992) studied the relation of infant feeding to adult serum cholesterol concentration and death from ischaemic heart disease. The study showed that in babies born 70 years ago who were breast fed and weaned relatively late (after 1 year) a process was established was associated with raised serum concentration of low density lipoprotein cholesterol and increased death rates from Ischaemic heart disease in adult life. Standard Mortality Ratios, serum concentration of total cholesterol, and low density lipoprotein cholesterol all tended to be higher in men who had been breast fed and had not been

weaned at 1 year and in those who had been exclusively bottle fed. The breast fed children weaned before 1 year fared best. Whether there is any causal relationship between the two situations remains to be determined.

7.15: International Comparisons of Dietary Intake

The Belfast MONICA Project carried out the joint EEC / WHO MONICA project nutrition study (Monica/Ectim Meeting 1993) in 1985 -1986 in 401 male subjects (45-64 years) using 3 day weighed records.

Table 7.9 Mean Energy Supplied by nutrients in MONICA Study and National Nutrition Survey.

	MONICA	National Nutrition Survey
Percentage Supplied from:		
Protein	14.2	15.2
Carbohydrate	43.2	46.3
Total Fat	38	34.3
Saturated fatty acids	16.5	NA
Monounsaturated fatty acids	14	NA
Polyunsaturated fatty acids	4.8	NA
Alcohol	4	4.1

In the MONICA study the ratio of polyunsaturated to saturated fatty acids was 0.32. The percentage energy supplied from total fat was greater in this group than in the National Nutrition Survey. The National nutrition Survey did not supply information on the types of fat consumed, so a comparison cannot be made on ratios of polyunsaturated to saturated fats.

In 1989 another dietary survey was carried out in Northern Ireland. This was part of the Northern Ireland Diet, Lifestyle, and Health Study (Barker et al 1989). It was based on a random sample of 616 men and women aged 16- 64 years in Northern Ireland. The method of dietary assessment was the 7 day weighed intake. A comparison of the data in this study from men aged 45-64 years was made with similar samples from Caerphilly (South Wales) Edinburgh and Bristol. All of these studies used the same method of collection of dietary data.

Table 7.10 Comparison of Nutrient intakes from studies in Caerphilly, Northern Ireland, Edinburgh and Bristol

	Caerphilly	Northern Ireland	Edinburgh	Bristol
Energy MJ	10	9.8	11.2	9.7
Protein g	82	85	91	82
Total Fat g	99	102	114	99
% Fat Energy	37	39	38	38
Saturated fat g	46	44	49	46
Monounsaturated fatty acids	38	37	42	38
Polyunsaturated fatty acids	13	16	14	14
Carbohydrate g	274	275	298	265
Dietary Fibre	19	20	20	21
Alcohol g	20	7	26	14
P/S Ratio	0.31	0.38	0.30	0.32

Source: Fehily 1993

The table 7.10 shows that the intakes of energy were higher in Edinburgh than in the other 3 areas, otherwise differences in nutrient intakes were very small. The exceptions were Polyunsaturated to saturated fat ratio and alcohol consumption. The P/S ratio for Northern Ireland was considerably higher than that for other areas (0.30, 0.32, 0.38).

The proportion of heavy drinkers was higher in Edinburgh (15%) than in other areas (5 -9%) and the proportion of abstainers was highest in Northern Ireland.(38%). Differences in nutrient intakes did not parallel the differences in Ischaemic Heart Disease mortality between the areas.

7.16: Coronary Heart Disease in France and Ireland

The incidence of Coronary Heart Disease is 4-times higher in Belfast than in France. Population surveys carried out within the framework of MONICA registers and the ECTIM study reflect the absence of striking differences in conventional risk factors between France and Northern Ireland. The Belfast MONICA centre and the 3 French registers participated in a nutritional survey (EURONUT 1985). However, there are two important issues within this: the extent to which variation in risk factor patterns within France itself can account for differences in incidence or mortality, and secondly what other factors are known to differ between France and other countries The study shows that even in France there is a gradient of risks with those in the North being more at risk than those in the Mediterranean South. This is consistent with the risk factor profile..

The comparative analysis of the initial survey in men aged 45-64 years in Belfast and in Toulouse, shows a higher consumption of polyunsaturated fatty acids in Toulouse (7.1% vs. 4.6% of total energy) with a higher P/S ratio (0.50 vs0.30), a lower alcohol consumption in Belfast (3.6% vs6.4% of total energy) and a higher intake of fruit and vegetables in Toulouse.

These are preliminary results presented at a meeting in Belfast in April 1993. The Vitamin C serum level found in males is twice as high in Toulouse as in Belfast, in accordance with the amount of vegetable intake. Nutritional behaviour differences were seen to corroborate the hypothesis of the protective role of unsaturated fat and vitamins (E and C) against Ischaemic Heart Disease.

7.17: Comparisons with Past Diet

Before 1990 the last National Nutrition Survey was carried out between 1946 and 1948. It consisted of a dietary investigation of 2350 families divided fairly evenly between urban and rural areas. The method used for dietary assessment was a 7-day weighed inventory. The results were generally satisfactory for the population as a whole (e.g.. where children were concerned, about 75% were classified as being in a 'good nutritional state ' whereas about 2.5% were defined as being in a poor nutritional state. There was of course considerable variation in this last statistic with as many as 12% of the sons of unemployed workers in certain towns being classified as in poor nutritional state).

Table 7.11 Comparison of the average daily nutrient intake /capita /day in 1948 and 1990.

	Energy MJ	% Protein Energy	% Fat Energy	% Carbohydrate Energy	Calcium	Iron
1948	13.04	13	29	58	1369	20
1990	9.79	15	36	49	1075	12

The higher energy and nutrient intakes in the 1946 -1948 survey are extremely striking. This can possibly be explained by the higher energy expenditure (and hence demand) of the general population as a result of contributory factors such as greater physical labour, less transport, few labour saving devices and poorer housing quality, insulation and heating. There has also been a marked increase in relative fat intake (of which saturated forms a major proportion); and a significant decrease in iron intake.

Table 7.12 Food consumption intakes /capita /day in the 1946/1948 and 1990 surveys.

	1946/48	**1990**
Milk	569	426
Eggs	43g	24g
Cheese	3.3	6.1g
Meat	125g	153g
Fish	14g	15g
Potatoes	549g	225g
Vegetables	125g	59g
Jams	18g	9g

The higher consumption of milk can possibly be attributed to the high percentage of farming families in the 1948 survey, (32% of those surveyed). The higher potato intake in 1948 contributed to the higher energy intake, although 100 years earlier in 1840 the Irishman's diet consisted of 10lbs or 4800 g. potatoes and 1 pint whole milk per day. The 1990 cheese intake is double that of 1948. In the mid 1940s there was relatively little purchasing of 'shop goods'. The intake of vegetables in 1990 is less than half that of 1948.

Table 7.13 Trends in percentage of energy derived from Protein, Fat, Carbohydrate, from 1863 to 1990.

	Protein	**Fat**	**Carbohydrate**
1863	11	9	79
1904	11	24	66
1936	12	29	59
1948	13	30	57
1961	17	29	54
1971	19	34	47
1990	15	36	47

Source: Deirdre Haslett, History of the Irish Diet 1988

Comparing the percentage of energy derived from Protein, Fat and Carbohydrate from 1863 to 1990 we see that the fat intake has increased dramatically from 24% at the beginning of the century to today's level of about 36%, and correspondingly the carbohydrate content has decreased. Dietary fibre has fallen over the last 50 years to about 90% of mid 1930s level from just over 20g per capita per day to about 18 g per capita per day. While the two world wars caused temporary disruption to the Irish diet, it was the 1960s that were the years of great change. Cremin and Morrisey (1976) calculated changes in the mean per capita daily consumption of the major nutrients and foodstuffs from 1961 to 1971.

Table 7.14 Per capita consumption of the 13 Major Food Items in the Irish Diet 1961 to 1971 in grams / day.

	1961	**1964**	**1968**	**1971**
Fresh Milk	590	588	586	581
Potatoes	423	414	388	366
Bread	183	175	170	160
H.H. Flour	107	91	79	73
Sugar	87	74	74	72
Pigmeat	62	70	71	85
Beef	42	45	49	53
Eggs	35	34	30	29
Creamery Butter	33	36	33	34
Mutton	29	30	30	31
Poultry	14	19	26	29
Margarine	8	9	10	11
Cheese	4	5	6	7

Source: Deidre Haslett, History of the Irish Diet 1988

The table 7.14 above shows that the consumption of some of the principle items of foodstuffs in the Irish diet changed quite considerably even during this decade. The consumption of beef, pork, poultry, and margarine showed a consistent upward trend, while the consumption of potatoes, bread and flour declined.

Chapter Eight

The Social and Personal Factors Influencing the Irish Diet

8.1 Attitudes

Previous chapters in this report have described the current situation with regard to health status, food production and supply, and current dietary intake in Ireland. The consumer's interest in a healthy lifestyle must however be seen as a driving force in changes which are occurring throughout the food system.

Amongst socio-economic changes in Ireland as discussed earlier in the report are changes in lifestyles, work habits, the age profile of the population as discussed earlier in the report, particularly numbers of over-60s, urbanisation, and the proportion of women in the workforce. According to the recent F.A.S./ ESRI employment forecast for instance the female share of total employment in Ireland will increase from its current level of 33% to 35.4% by 1996.

A family's food consumption depends on its income, the price and availability of the various food items, the number and composition of its members, their lifestyle, particularly the time available to them both to prepare and eat food, and on its preferences, which are in turn related to habit and fashion. The age structure of the population in Ireland is changing. The Irish age distribution has traditionally featured a relatively large proportion in the younger age groups, with emigration affecting the proportion in the middle and older age groups. A likely key feature of the years ahead is therefore a significant reduction in the size of the 0-15 age group with a consequent increase in the proportion of the population in the 50-64 age category. Based on current assumptions it is predicted that between now and 2011 the population over 65 will grow by more than 4% while the number under 15 will decline by 31%.

Pensioners have been observed to consume less food (indeed WHO estimated calorie requirements are almost 20% lower for over 65s than for those in their 20s) and in particular less meat, fish, eggs and vegetables. They also eat out less, though this pattern may change with newer generations of over 65 years. The decline in under 15 year olds will affect food consumption patterns. A study of young people and their food choices in 1992 by Kay Cunningham for C.B.F. showed

that young people are leading very rushed lives. Snacks such as crisps, Coke, and chocolates were consumed on the way to school, often instead of breakfast. These foods formed an important part of other in-between snacks throughout the day. After the evening meal an average of six snacks consisting of tart, cake and biscuits, crisps, sandwiches, sweets, chocolates, popcorn, cereal, soup, beans on toast, fizzy drinks, bun burgers, Chinese take-aways, pizza, kebabs, ice-cream, pate, and various drinks such as tea, cocoa and hot chocolate, are consumed.

An assessment of school meals and of growth, food intake and food likes/dislikes of primary schoolchildren in 5 inner city Dublin schools was carried out by Ronan Gormley on behalf of Combat Poverty in 1989. Frequency data for foods consumed, liked and disliked, showed a heavy weighting in favour of chips, burgers, sausages, tea, toast, corn flakes, and a major dislike of many vegetables and cheese. Other important foods such as red and white meats, fish and fruit got relatively little recognition by the children.

If recent employment trends continue we will see an increase in the proportion of households without any workers, and at the same time an increase in the number of households with two workers. Their food consumption patterns will be very different. It is to be expected that the trend towards a shorter working week will continue, so that even the two-worker family will have more leisure time in the future. Cooking and shopping, as well as eating, are hobbies to many people and can be indulged more as leisure time increases.

The generally uninteresting part of cooking is food preparation, and it therefore seems likely that the trend towards ready prepared fresh food, chilled and vacuum or modified/ controlled atmosphere packed, will develop strongly. As the social structure in Ireland has and continues to become more complex so the food market becomes less homogeneous and more fragmented.

8.2: Feeding The Family

The main cook in Irish households is currently the housewife. A study entitled "The Irish Housewife -A portrait" by the Irish Consumer Research Ltd. 1986 revealed that although the housewife is concerned to provide meals that will be eaten and enjoyed she has diverse tastes to try and satisfy. Husbands tend to be conservative and want the basic traditional dishes, while children, almost universally it seems want burgers, chips, sausages, tinned baked beans, and fish fingers all the time. Most children are not keen on fish or salads or vegetables apart from baked beans.

However, preliminary results from a six year research programme in the U.K. shows that if a wide range of foods are introduced to young children between

4 and 6 months, they learn to like a much wider range of foods. (Personal Communication Dr. Anne Murcott, London School of Hygiene & Tropical Medicine) Researchers at the University of Wales in Bangor have found that children can learn to like healthy food that they previously found distasteful. The study has already found that dietary preferences were not biologically determined or deep-seated, and that it was possible to change a child's aversion to a particular food almost overnight and maintain that change.

The study of the Irish housewife shows that she is the one most likely to be concerned about the health implications of the household diet. A great many housewives in Ireland bake fairly regularly including bread, cakes, scones, rhubarb pie, apple tart, sponges, and flans. One big change as regards family meals is the vast increase in the range of, and the use of convenience foods. These are frozen, canned, or otherwise prepacked, and all have the characteristics that they take very little preparation for the table, and are also easy to store. The housewife has mixed feelings about them:

1. They are a dearer way of feeding the family.
2. They may not be doing the family as much good as foods she buys and prepares herself. It is felt that much of the goodness of convenience food is lost by being frozen, packaged, and stored.

Results of the FAST II programme (Forecasting and Assessment in Science and Technology 1987) indicate that consumers have become concerned that as food technology becomes more complex through the introduction of new product techniques- (Extrusion, irradiation, controlled and modified atmosphere packing, fractionation and recombination of food constituents etc.) it becomes more difficult to control the quality and safety of food products. Similar concern is expressed over intensive agricultural production methods (growth hormones, antibiotics, high fertiliser application, pesticide residues etc.)

On the one hand the housewife enjoys feeding her family and is deeply interested in providing what is good for them, as well as what they enjoy; on the other hand she has doubts about pre-packaged foods, about fresh foods, and also about normal traditional foods (which are often reported in the media as being injurious to her health.). In the meantime the housewife manages as best she can; compromising between the thrice daily ever present need to feed the family, from what is available, and affordable, and at the same time trying to accommodate to the information and warnings that are constantly being picked up by her as to what constitutes a healthy diet. Not surprisingly, she sometimes finds herself doing one thing and saying another. She may say that chips are bad for you, yet regularly serve them at the table (The Irish Housewife -A portrait 1986).

In the study on dietary beliefs and practices by Kearney and Gibney (1993) the most frequently nominated sources of healthy eating information were television and radio (47%), although doctor/G P was chosen as frequently as Television.

and radio by people 65 years and older, 44% and 43% respectively. The most common misconceptions were that Flora margarine contains less calories than butter (73%) and that fresh vegetables are better than frozen vegetables (86%). The basic attitude to food is one that values serving plenty of good plain solid food. It is not an attitude which readily goes in for fancy foods, or fanciful ways of preparing food.

There are signs that the Irish outlook is beginning to change,- one of the trends in the picture of today's food consumption is the increasing interest in, and acceptance of , continental style foods and sauces, and dishes of foreign origin. The whole range of delicatessen foods falls into this category, and explains the increase in the number of delicatessen shops and counters that have appeared in recent times in all parts of the country (the 1988 census of distribution has a figure of 134 for the state).

8.3: Shopping Habits

The vast majority of housewives do a major part of their shopping on a once-weekly visit to a supermarket. In addition they may make minor shopping trips a few times a week to local shops, or a subsidiary visit to a supermarket.
The day on which the main supermarket shopping is done varies between Thursday, Friday, Saturday. This is sometimes related to the husbands pay day (or their own, if they work). The weekend is by way of being a minor festival that occurs every week. While it lasts there is also some vague atmosphere of 'plenty' in the household. Meals at the weekend tend to be more 'special' than during the week. Supermarkets are favoured for certain kinds of purchases. The staple range of groceries, toiletries, and cleaning materials, are the prime purchases, although of course almost all fast turnover consumer goods can be bought there.

Housewives show some resistance to buying fresh meat, fresh vegetables, and fruit in supermarkets. Many claim to buy these separately, from butchers and greengrocers shops respectively. They claim that such foods are not as fresh in the supermarket as in the specialist shops. It is evident that those housewives who buy their meat at a butcher's often have a more or less personal relationship with the particular butcher. For many people the 'ceremony' of buying at the butchers is what makes it special. By comparison, buying a pre-packaged joint from the supermarket can be felt to be too casual and off-hand for such an important purchase. While many housewives go 'small shopping' 2/3 times /week there is a minority that go shopping every day. These shopping trips are part of the housewives socialising.

Housewives are well aware of own label brands in their supermarket. About 10% say they never buy own-label goods. Own-label means a cheaper price than the manufacturer's brand. That is the main part of their appeal. On the other hand, own label goods are suspected of being of inferior quality than the manufacturer's brands. Hence, there is a conflict between quality and price. Some types of own label sell more than others. The ones that sell more are the ones where the house wife perceives quality to be less important e.g.. jam, washing up liquid and tissues. However manufactured brands of tea and coffee are preferred to own label. The rewards of using the supermarket can be contrasted with those of the smaller local shop. One of the greatest assets of the independent grocer is the friendliness and personal nature of its services. By contrast the supermarket is impersonal. The emphasis on supermarket promotion is centred on price. Price is, of course a leading, if not the leading priority. The housewife wants a price, product, quality and style. She wants a supermarket atmosphere that answers to a' lifestyle' not merely to a budget.

Part of the reason the housewife wants to find manufactured brands in the supermarket is because these brands are usually sensitively consumer oriented. Without them it would begin to feel like an institution. The number of smaller shops continues to decline in the face of the growth of the supermarket chains

One of the positive characteristics of the supermarket is that it is bright, modern, alive in atmosphere. A minority of small independents have fought back against the multiples with profitable effect. A study of consumer food choice, socio-economic profile, and retail provision in 2 Galway supermarkets serving different socio-economic areas was carried out in 1991 (B. Dineen et al). This study was conducted outside 2 supermarkets of the same store chain. The stores were also examined for product displays, location, range and provision of food items. The study confirmed real differences in range and availability of foods between supermarkets serving different socio-economic groups, with variable consumer satisfaction.

8.4: Consumer Technologies

In the home the freezer has had a big impact on food consumption. The convenience of being able to store previously perishable products like unprocessed meat, fish, fruit, and vegetables has increased the overall consumption of these products, and decreased the demand for the processed alternatives (canned and bottled fruit and vegetables, preserved meats.) The microwave oven is already installed in six out of 10 American households and 32% of Irish households.(Wilson Hartnell 1993.) This will result in new products and new methods of distribution .

Even equipment not directly related to food such as the video recorder which opens up new leisure patterns centred on the home, can affect food consumption. Less meals are bought outside the home, or they are purchased

as take aways to be eaten at home. Less meals are eaten together as a family which encourages the development of snack foods.

8.5: Changing Attitudes in Ireland 1991

The report on Changing Attitudes in Ireland 1991 states that Irish consumers can be segmented on the basis of their behaviour patterns in regard to diet and health, identifying five seperate segments.

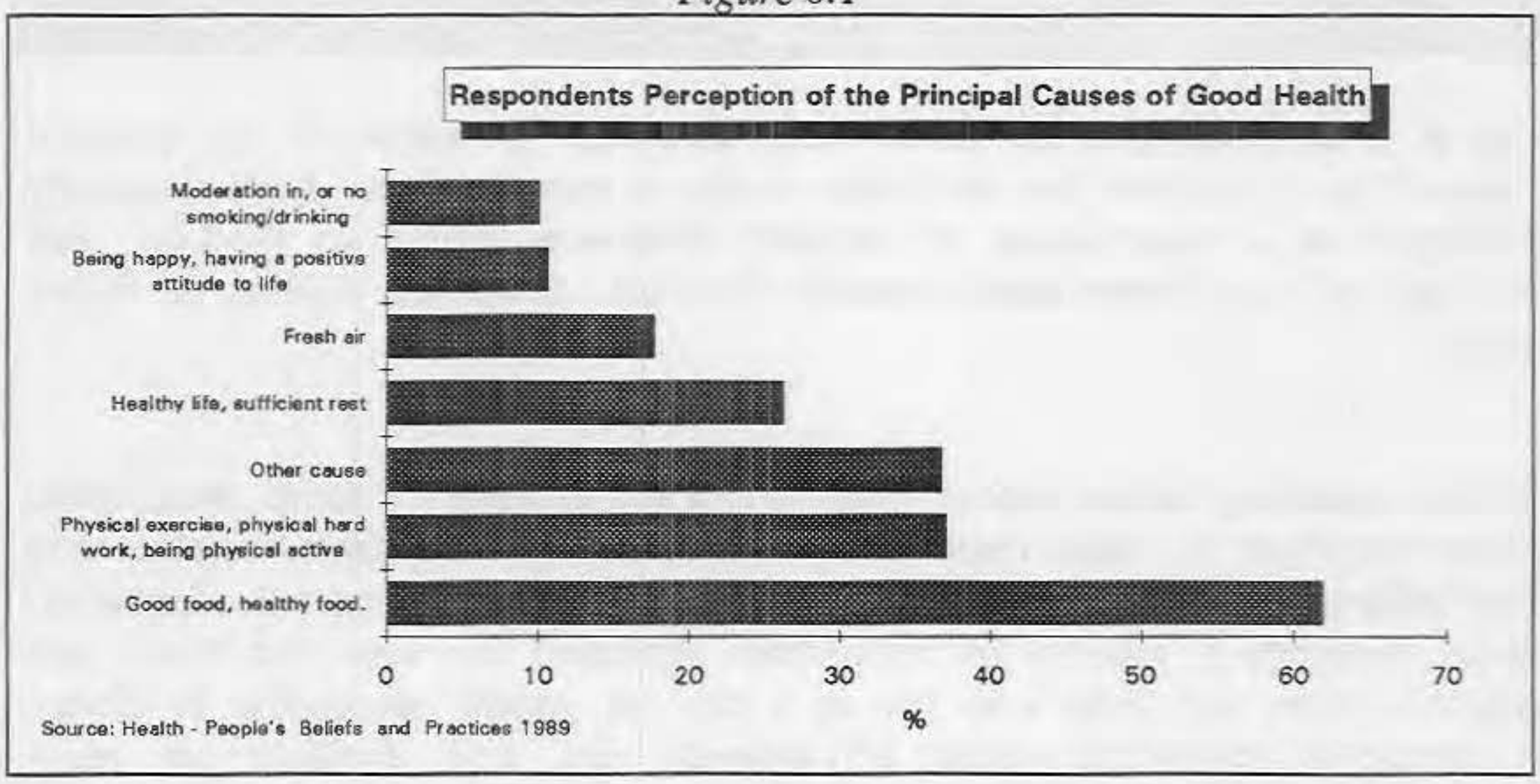
1. Moderinists - young, experimental, interested in healthy eating but succumbing regularly to the temptation of snacks between meals.
2. Low Fat Focus - These people are significantly older and more conservative in outlook than many people would believe.
3. Snackers- youthful, fast food oriented, not particularly concerned about health and not very experimental.
4. No Fat Concern - somewhat older, predominantly male and not concerned at all about fat content in food.
5. Conservatives - oldest group overall, a cross section of men and women but with very traditional and conservative eating patterns.

About 2/3 of adults believe that you live longer if you maintain a healthy diet. As many people feel that there is too much fuss and worry about what people eat nowadays. While 57% of people try to eat less fat and 54% try to eat healthier foods just over half the population run into problems because they tend to agree "that you can't believe everything you hear about health claims for different types of food". It was estimated that approximately 40% of respondents eat less fat by taking low fat or diet products on a weekly basis. 74% of people take snacks between meals weekly and more often. Detailed analysis of results shows that more than 60% admit to taking snacks between meals on most days of the week. The report also indicated the relatively low incidence of frequent wine drinking, consumption of "exotic" foods, visits to restaurants or having dinner parties at home.

8.5: Diet and Health Beliefs and Practices

A study 'Health - People's Beliefs and Practices' was carried out by Des McCluskey, Health Promotion Unit in 1989.

Figure 8.1



The results showed that the factor most frequently perceived as the principal cause of good health was food- good food, healthy food,- over 3/5 of the respondents mentioned this factor. Physical exercise including physical hard work was 2nd(>1/3 of respondents), followed by a healthy lifestyle (>1/4) and fresh air.(>1/6). Other factors seen as contributing to good health were being happy and having a positive attitude to life, and abstinence from or moderation in, smoking or drinking.

Reference to being happy and having a positive attitude to life was associated more with city respondents, with those in non-manual occupational categories, and with those who had attained higher levels of education. Fresh air was stressed more by respondents in the farmers category and by those in rural

areas. Abstinence from, or moderation in smoking or drinking was referred to more frequently by men and by those living in the city. The importance of a healthy lifestyle was emphasised more by older respondents.

A study of Dietary beliefs and practices by M. Kearney and M.J. Gibney showed also that 'eating a healthy diet was the factor most frequently indicated as the most, or second most important in promoting good health (57%), followed by giving up smoking (46%), and taking regular physical exercise (39%)

8.6: Principal Causes of Physical Illness

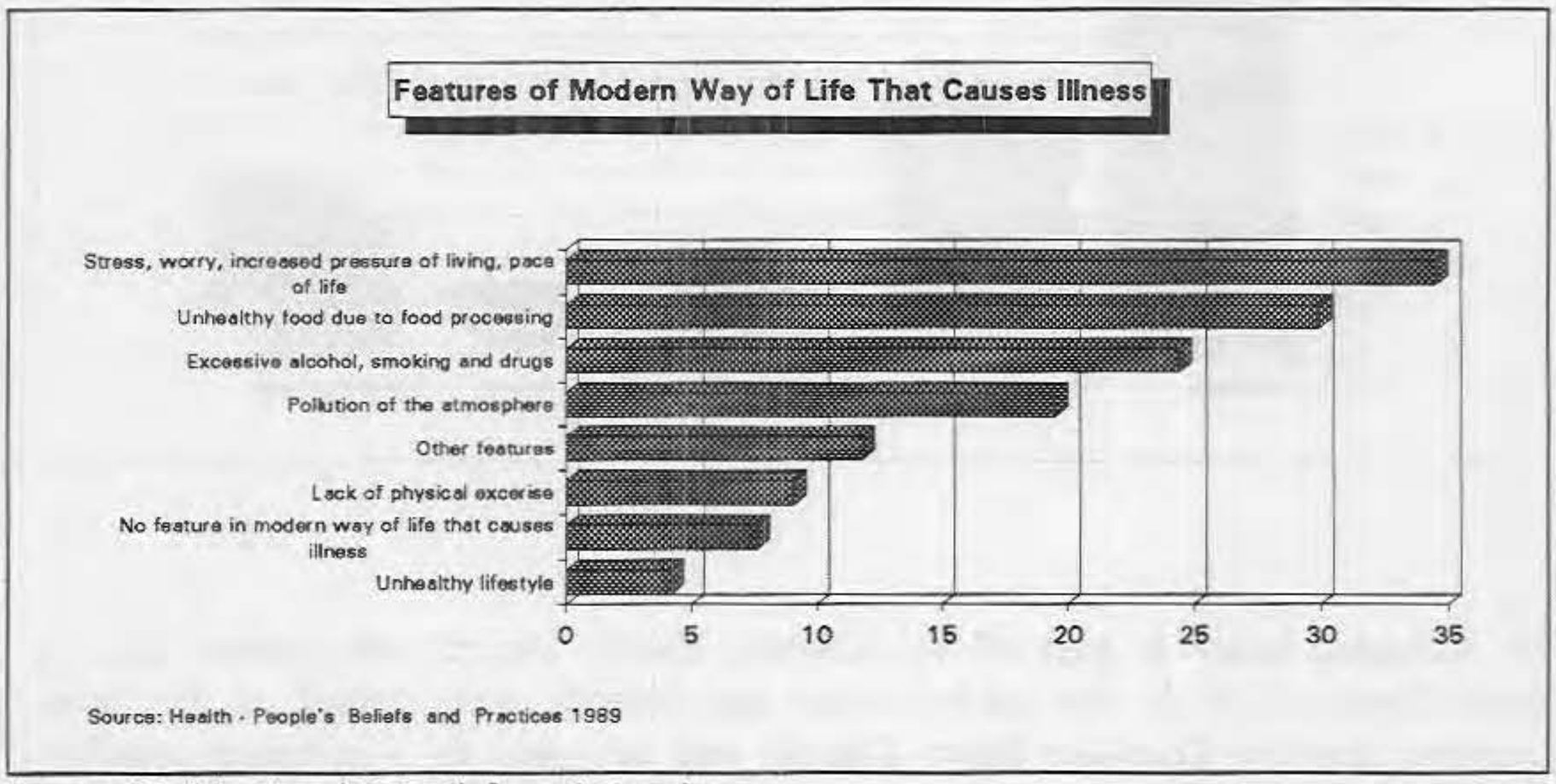
Just as good food was the factor most frequently perceived as the principal cause of good health,in the McCluskey study, so too the factor most frequently mentioned as a major cause of physical illness was related to food i.e.. bad diet, lack of nourishment and unhealthy food (i.e.. processed, canned or frozen food).

Of the remaining factors worry/ stress and an immoderate lifestyle were given greater emphasis by older respondents. Otherwise socio-economic variables had little influence on the respondent's perceptions of the major causes of physical illness. Although a majority of respondents expressed the view that those who live on a farm and those who live in a city are equally susceptible to illness, a substantial proportion (almost 2/5) believed that city dwellers are more vulnerable. The greater vulnerability of city dwellers was attributed to the more polluted atmosphere of the city. Opinion was more divided when respondents were asked to consider the relative effects on health and illness of life today and life 50 years ago. Over 2/5 of the respondents believed that people 50 years ago were less likely to get ill than people today. One quarter of the respondents were of the opinion that people 50 years ago were more susceptible to illness.

8.7: Features of Modern Way of Life that Cause Illness

The main features of life that people associated with illness are shown below.

Figure 8.2



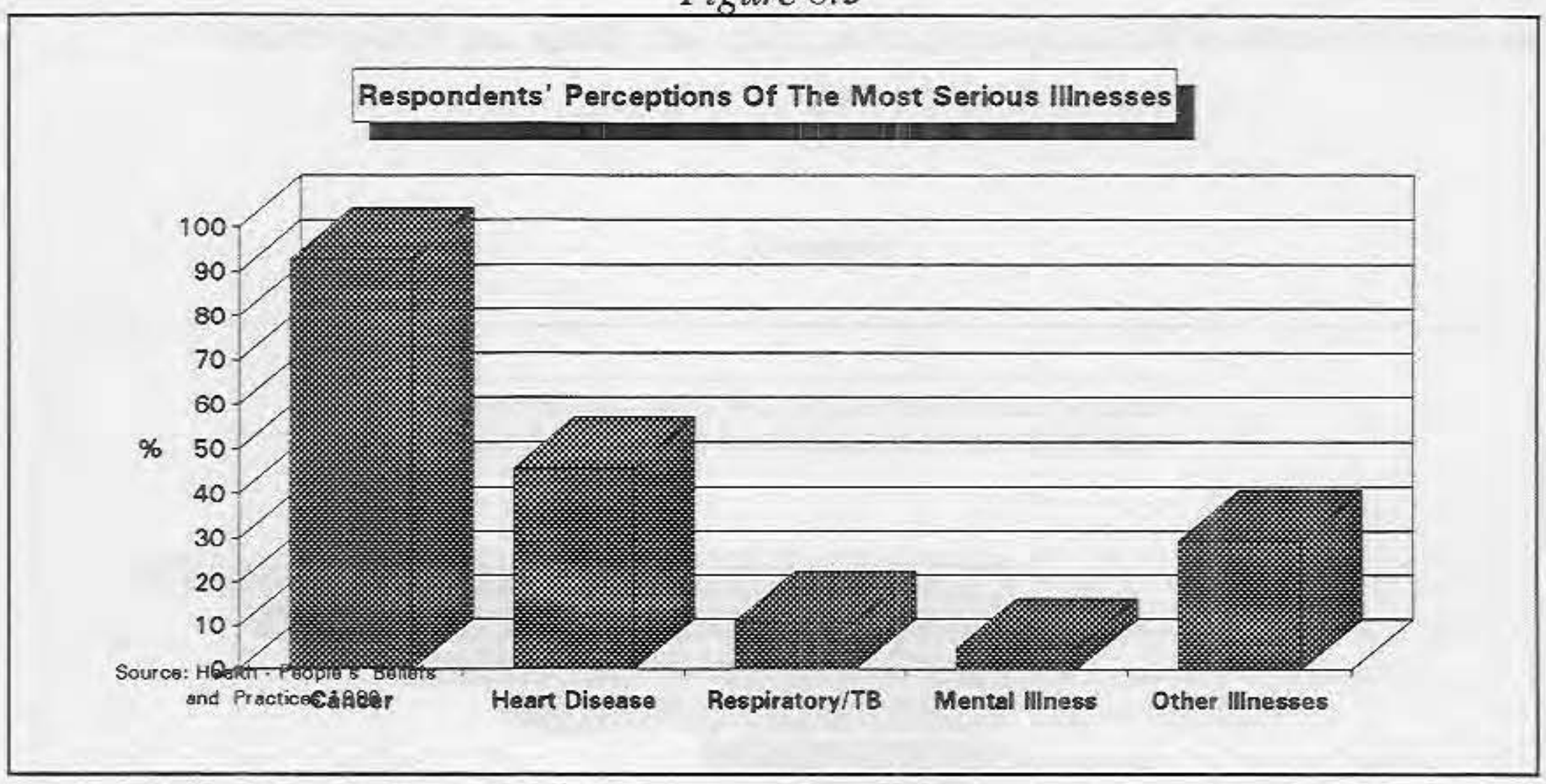
Source: Health - People's Beliefs and Practices

Worry and stress were referred to more frequently by respondents living in the city and by those in upper and intermediate non-manual occupations. A greater proportion of rural respondents than those in the city emphasised the deleterious effects of unhealthy food.

8.8: Perceptions of the Most Serious Illness

Cancer and heart disease were perceived as the most serious of all illnesses. They were considered as either incurable or difficult to cure, fatal or usually fatal. The chances of recovery from cancer were regarded as poor; however they were seen to improve should the disease be detected at an early stage. Those who identified heart disease as the most serious illness were more optimistic about the chances of recovery, and especially so if the disease was detected early.

Figure 8.3

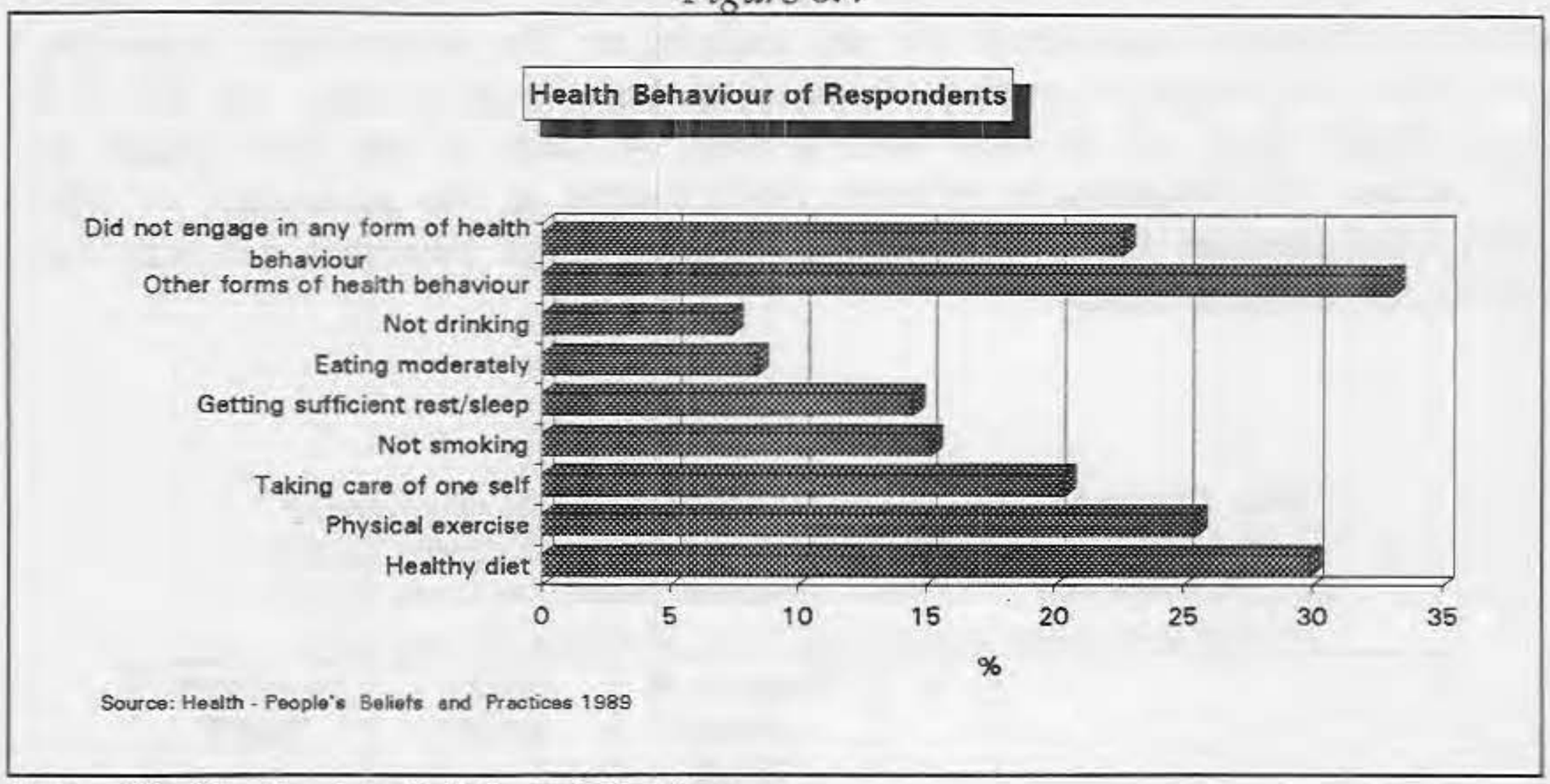


The Attitudes Study as part of the Kilkenny Health Project was carried out by Ronan Conroy 1989. In this study cancer and arthritis were named as the most important illnesses. Coronary Heart Disease was not seen as a common problem and was not named as a major cause of death locally. Acute CHD was seen as a traumatic event. The fact that many fatal attacks result in death within a period of hours, often in a previously 'healthy' individual, reinforced this view. Only acute episodes of CHD were seen as 'heart disease'. The medical concept of a slow, silent, but preventable occlusion of the coronary arteries was alien to the local concept. The study revealed that there was a lack of awareness that CHD was an important health problem in Ireland and a lack of belief in the effect of personal actions on life span.

8.9: Health Behaviour

It would appear that the forms of health behaviour most frequently engaged in by the respondents as the result of their conscious decisions, focused in food; eating what they perceived as healthy food and avoiding what they regarded as unhealthy food e.g.. fats. This was not unexpected as good healthy food was most frequently mentioned as the principal cause of good health and lack of nourishment and unhealthy food were the factors most frequently identified as contributing to illness.

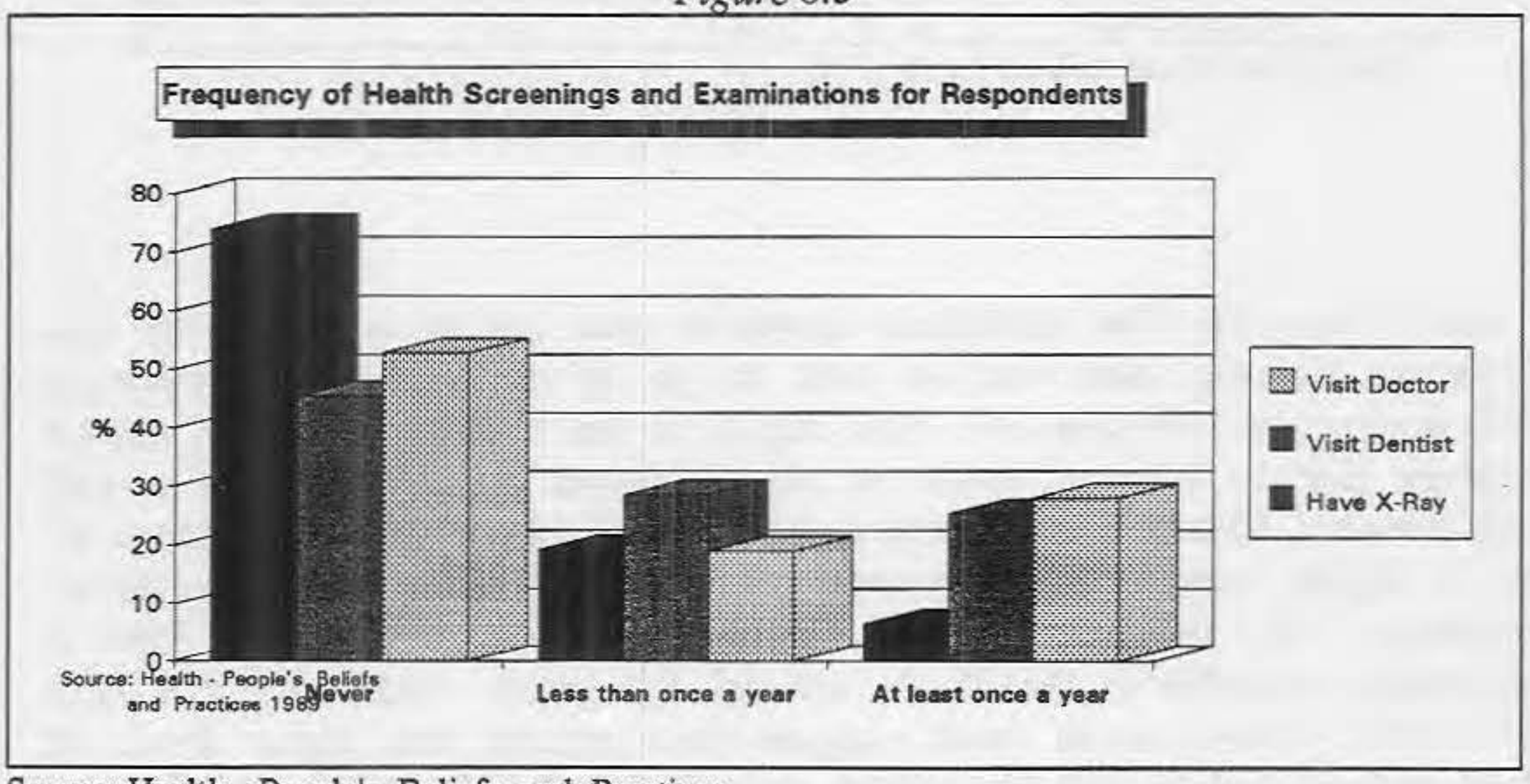
Figure 8.4



Source: Health - People's Beliefs and Practices

When the effects of socio- demographic variables on health practices were examined, it was found that engaging in physical exercise, the avoidance of smoking, and an emphasis on eating healthy food were more characteristic of city respondents than of those in rural areas. Engaging in physical exercise was also more characteristic of younger respondents, of those with higher levels of educational attainment, and least characteristic of those in farming and lower manual occupational categories. Avoidance of smoking was associated more with those in upper and intermediate non-manual occupations.

Figure 8.5



Source: Health - People's Beliefs and Practices

From the figure it can be seen that visits to a doctor or a dentist for a check up were infrequent occurrences for the majority of the respondents. Somewhat more than 1/4 sought a medical check-up at least once a year, and just 1/4 had a dental check up at least once a year. A study of the Oral Health of Irish adults (D. O'Mullane, H. Whelton 1990) looked at the percentage of Irish adults who attended the dentist regularly, dental health outcomes, and also the reasons for non-attendance.

Table The number and percentage of dentate subjects, mean number of natural teeth present, mean decayed missing and filled teeth (DMFT) and percentage with 18+ sound untreated un-traumatised teeth (SUNT) for regular attenders by reason for 16-24, 35-44 and 65+ year olds..

	%	Mean no. of natural Teeth	Mean DMFT	% with 18+ SUNT
16-24				
Regular Attender	34	26.8	8.2	73
No Need	37	27.5	6.5	84
Fear	8	26.8	8.7	83
Cost	13	27.5	7.3	78
Other Reason	8	28.1	6.1	90
34-44				
Regular Attender	39	22.4	19.5	6
No Need	26	21.2	16.9	25
Fear	8	20.8	17.7	27
Cost	16	21.2	18.9	22
Other Reason	11	23.1	17.5	27
65+				
Regular Attender	28	19.3	21.6	3
No Need	50	12.4	22.7	4
Fear	2	12.0	23.5	0
Cost	8	10.2	24.7	0
Other Reason	12	12.3	25.6	0

Source: Oral Health of Irish Adults 1990.

It can be seen that the attendance figures in each age group are similar. The percentage claiming there was no need to go to the dentist was higher (at 50%) amongst the 65+ year olds. With regard to the 3 dental outcomes, regular attenders tend to have an equal or slightly higher mean number of natural teeth present. Among the 2 younger age groups, regular attenders tended to have a higher mean DMFT (decayed, missing, and filled teeth.) and a lower percentage with 18+ SUNT (sound, untreated, un-traumatised teeth) This is particularly noticeable in the 35-44 year old age group, where only 6% have 18+ SUNT. These results would suggest that persons with higher levels of dental disease tend to visit the dentist more frequently. Equally those infrequent

attenders who did not perceive a need to attend the dentist appear to have lower levels of dental disease.

When the figures are broken down by sex, the percentage of males and females who are regular attenders are very similar. A higher percentage of males (46%) felt there was no ' need' to attend than females.(31%) There was no obvious difference between males and females in the oral health outcomes in the different response groups. In all age groups a considerably higher percentage of non medical card holders were regular attenders when compared with those holding a medical card. A higher percentage of medical card holders gave 'no need' as the reason for non attendance. A high proportion of subjects in all 3 age groups claimed that they normally visit the dentist only when in pain or in trouble.

8.10: Illness Experience

Studies in other countries have shown that serious illness occurs more frequently among the manual working classes. A study on the Utilisation and Financing of Health Services in Ireland was carried out by B. Nolan for the E.S.R.I. (1991) The main findings are summarised below.

Sharp differentials across the social classes in the percentage reporting chronic illness were seen; those from semiskilled and unskilled manual social classes were considerably more likely than others to report such illness.

Table 8.1 Physical Illness Entitlement category and age 1991.

Age Group	Percentage reporting major illness			
	Category I	Category II	Category III	All
15-24	8.9	4.0	-	5.2
25-34	11.1	7.0	5.0	7.8
35-44	20.4	8.3	6.0	11.0
45-54	28.3	15.3	11.2	18.4
55-64	41.4	24.0	19.1	30.9
65-74	35.6	26.3	14.8	32.5
75+	38.7	30.5	-	37.1
All	27.1	11.7	8.5	16.9

Source: ESRI 1991

A substantially higher proportion of those in Category 1 than the remainder of the population reported having a major illness -27% compared to 12% of those in Category 2, and 8% of Category 3. 58% of those with an illness, compared

to only 36% of all the responding adults are in category 1. Looking at the age composition of the different entitlement categories the table shows the pattern of reported illness by age group for all responding and by entitlement category. The percentage reporting an illness rises steadily as age increases from 55 of those aged 15-25 to 37% of those aged 75 and over. The much higher level of reported illness by age group in category 1, together with the relatively high proportion of elderly people in that category have major implications for health service utilisation. Looking at the age/sex breakdown the table shows that a slightly higher proportion of men report illness among those aged 55 and over, but the opposite is the case for 25-54 age range.

The higher proportion of elderly men reporting illness is offset by the fact that a slightly higher proportion of women are in those 'high-risk' age groups.
The gap was particularly pronounced in the middleage groups where over twice as many people in the unskilled manual class as in the professional and managerial ones reported such illness. Similar social class differentials in the prevalence of psychological distress were seen, the proportion above the critical threshold being about twice as high in the unskilled manual as in the professional/managerial classes.

8.11: Utilisation of Health Services: GPs & Prescriptive

People who are entitled to free G P care (Category 1) have a considerably higher incidence of physical and psychological ill health than the remainder of the population. Category I refers to those entitled to all general medical services free of charge (about a third of the population).

Table 8.2 No. of GP Visits and percentage reporting illness by category

Visits	***Percentage reporting major illness***			***Percentage of all Cases***
	Category I	Category II	Category III	
0	33.6	49.4	48	43.7
1-5	35.2	36.8	42.3	37.0
6-10	10.6	7.8	6.6	8.6
11-20	16.8	4.6	2.9	8.5
21-50	2.6	1.2	0.2	1.5
Over 50	1.2	0.3	-	0.7
Total	100	100	100	100
Average No of Visits	5.3	2.5	1.8	3.4

Source: ESRI 1991

The study showed much higher G P visiting rates for those in category 1 than the rest of the population. Those with medical card cover had over twice as many visits in the year as the rest of the population even within age groups. People in category 1 had more prescriptions per G P visit than the remainder of the population. Des Mc Cluskeys study showed that the likelihood of having consulted a doctor was greater for a city dweller than for those in rural areas, for those aged 35 and over.

Those in the sample with VHI cover and those in entitlement Category 1 were more likely than others to have had a hospital in-patient stay.

8.12: Exercise

Exercise is an important component of a healthy lifestyle. A study commissioned by Cospoir, the Irish National Sports Council, in 1989 examined the fitness levels of a sample between the ages of 6 and 12 years of age. It concluded that the fitness levels of Irish primary school children were low. A further study carried out on Irish secondary school children (Watson 1990) found that 1/4 of the boys and 1/3 of the girls were seriously lacking in aerobic fitness and 1/2 the boys and 1/3 of girls had very inadequate levels of flexibility. Approximately 1/4 of subjects of both sexes were seriously overweight. However, this was not a national sample. Regular participation in physical activity by adults is associated with increased longevity and decreased risk of coronary heart disease. The same relationships have been examined in children and available studies indicate that there are significant associations between the lack of available activity and the existence of cardiovascular disease risk factors in children.

Over the last few years a study was carried out on the fitness, physical activity, attitudes and lifestyles of children from Northern Ireland (Riddoch1989). It was found that while a large majority of both girls and boys enjoy exercise, boys of all ages were considerably more active than girls. Girls of all ages were found to participate in very little vigorous exercise. The amount of vigorous exercise taken by older girls was extremely low.

The Kilkenny Health Project baseline study 1985 examined activity levels in men and women aged 35 to 64 years in Co. Kilkenny Ireland. Men were more likely to have sedentary, heavy or very heavy work activity while the majority of women had moderate activity during an average day. Only a small minority of respondents walked or cycled to work. 44% of those surveyed had leisure pursuits which were sedentary. At leisure, a higher proportion of men were involved in active sports or other vigorous activities for at least 3 hours a week. Men also spent longer each day walking, cycling or jogging. 16.5% of those surveyed engaged in vigorous activities for at least 20 minutes on 1 to 3 occasions weekly while 5.1% did so on 4 or more occasions. The Kilkenny post survey 1990 showed an important reduction in the percentage of men in Kilkenny who took no exercise during their leisure time- from 43% to 34%. There was little change in females- 45% were not active during their leisure time in 1990.

A study of psychosocial factors that discriminate among exercisers, occasional exercisers, and non-exercisers was carried out by Hope. The study was carried out among the workforce of a large Irish corporation. The results showed that fewer females (27%) were regular exercisers in comparison to males (35%), and a much greater proportion of females (45%) were non-exercisers in contrast to males. The results suggest that involvement and interest of girls in sport during childhood strengthens the likelihood of continued participation in adulthood. However, women's pursuit of sport/exercise may be contingent upon a college education, adequate income and access to facilities. Participation in physical activity declines with age, and the onset of children precipitates the ritual elimination of women from regular exercise. For males social support from peers is paramount to sustain regular exercise and to assist in body weight management.

References

Chapter Two. The Concept of Nutritional Surveillance.

Health, the Wider Dimensions 1987. Department of Health. Government Publication Office.

James, W.P.T., Ralph, A. 1991 What is Nutritional Surveillance? Proceedings of the Nutrition Society . *British Journal Nutrition*, Vol. 50 p. 653-59.

Methodology of nutritional surveillance. Report of a Joint FAO/UNICEF/WHO Expert Committee. WHO Technical Report Series, No. 593, 1976.

Chapter Three. History of the Irish Diet

Crawford, M. 1984 Death, diet and disease in Ireland, 1850: A case study of nutritional deficiency. *Medical History*, 28; 151-161.

Cremin, FN., Morrisey, PA. 1976 Food consumption trends in Ireland. *Irish Journal of Medical Science*, 4, 18-25.

Doyle, S. 1975 Nutrition and the Irish. *Journal Irish College of Physicians and Surgeons*, 44, 133-140.

Haslett, D. 1988. *History of the Irish diet over the last 100 years.* Unpublished manuscript: Trinity College Dublin.

Kelly, Alan. 1986 *Nutritional surveillance in Ireland.* National Nutrition Surveillance Centre, Trinity College Dublin.

Lees, B., et al 1993. *Differences in proximal femur bone density over two centuries.* Lancet, Vol 341, : 673-675.

Mahon, B. 1991 *Land of Milk and Honey*. Poolbeg Press: Dublin.

Power, C. 1985-6 Diet and disease: Evidence from the human dental remains in two medieaval Irish populations. *Journal of Irish Archaeology*, 3, 49-53.

Anderson, J.A.,Sogns, D.D. 1984 *Eds. Adverse Reactions to Food AAII Committee on adverse reactions to foods and NIAID US Department of Health and Human Services, Public Health Service NIH, Pub 84-244.*

Boreham, C., et al. 1992 *Children and Exercise XVI.* Pediatric Work Physiology, Coudert J, & Van Praagh, E (Editors), Mason, Paris, 1992.

Breast Cancer Research Unit, University College Galway. Personal communication, March 1993.

Carroll, KK. 1975. *Experimental evidence of dietaryfactors and hormone-dependent cancers.* Cancer Res; 35:3374-83.

Departmenty of Health 1993 *Health Statistics 1990.* CSO Stationery Office: Dublin .

Departmenty of Health 1993 *Health Statistics 1991.* CSO Stationery Office: Dublin.

Central Statistics Office 1992 *Quarterly report on Vital Statistics 1990.* CSO Government Stationery Office: Dublin.

Central Statistics Office 1992 *Quarterly report on Vital Statistics 1992.* Government Stationery Office: Dublin.

Comber, H 1991. *Sentinel Practice Network, Annual Report.* Irish College of General Practitioners, Nov 1991.

Dean, G. Kelson, M. *The reported mortality pattern in the countries of the EEC for six common cancers and ischaemic heart disease.* Br. Med. J. 1984; 77 (4) :98-100.

Department of Health 1992 *Perinatal Statistics 1988.* Government Stationery Office: Dublin

Fahey, T. 1993 *A Profile of the Wellbeing of our Elderly Population: Preliminary Findings of a Recent survey.* ESRI May 1993.

Fox, M 1990. *Adolescent attitudes towards body physique.* Irish Home Economics Journal Vol 1 no. 1: 8-24.

Herity, B., Hynes, M. & Barry, J. 1991 *Cancer, Ireland and the EC.* Royal College of Physicians of Ireland: Dublin.

Kelleher, CC. 1993. *Measures to promote health and autonomy for older people: A position paper.* National Council for the Elderly, Publication no. 16. 1993

Kilkenny Health Project 1992. *A Pilot Programme for Coronary Heart Disease Prevention in Ireland 1985-1990.* Kilkenny Health Project 1992.

Krausse, M.V., LK, Mahan. *Food, Nutrition and Diet Therapy, 7th Ed. 681-686.* London: W.B. Saunders. 1984.

Mc Gowan, M. 1991 *Descriptive and Dietary Aspects of Self-Reported Food Allergy.* Unpublished M.Sc. Thesis: Trinity College Dublin.

O' Mullane, D.,Whelton, H. 1990 *Oral Health of Irish Adults 1989-1990.* The Oral Health Services Research Centre, University College Cork.

Riddoch, C. et al. 1991. *Long term health implications of fitness and physical activity patterns. Archives of Disease in Childhood 1991*; 66:1426-1433.

Silva, MF., et al 1987. *The effects of cheese on experimental caries in human subjects.* Caries Research 20 (3), 263-269.

Sugrue, S. 1991 *Perception of Food Allergy.* M.Sc. Thesis: Trinity College Dublin.

The MRC Vitamin Study Group. *Prevention of neural tube defects: Results of the Medical Research Council Vitamin Study.* Lancet 1991; 238: 131-137.

Thomas, B. (Editor). *Manual of Dietetic Practice 1988.* Oxford: Blackwell Scientific Publications 1988. 383-385.

WHO Eurostat. Health For All Statistical Indicator Database 1993 World Health Organisation Regional Office for Europe.

Wiley, M. 1993 *ESRI HIPE Data.* Personal Communication Department of Health 1993.

Chapter Five. The Food Chain: Food Production and Distribution.

An Bord Trachtala 1992 Market Opportunities: Research based on Ireland's Food and Drink Imports 1988-1992. Government Stationary: Dublin.

Central Bank of Ireland 1992 *Annual Report.* Central Bank: Dublin.

Central Bank of Ireland 1992 *Economic Statistics.* Central Bank: Dublin.

Cuddy M.P. 1984. *New Ireland Report on Integrated Agriculture.*

Department of Agriculture, Food and Forestry 1993 *Report of the expert group on the food industry.* Government Stationary Office: Dublin.

Department of Agriculture 1990 *Agriculture and Food Policy Review.* Government Stationary Office: Dublin.

Department of the Marine1992 *Ireland: Facts about fishing 1992.* Government Stationary Office: Dublin.

Gabor, A., Granger, CWJ. 1977 *Price as an indicator of qulaity report of inquiry* Economic Feb 1966.

Government Trade Statistics of Ireland Government Stationery Office: Dublin.

Mc Nutt, P.A., 1991. *The Economic effects of changes in dietary habits.* Towards a National Cholesterol Education Programme. Published by Centre for Health Promotion Studies, Galway, p 65.

National Income & Expenditure Report 1990. Government Stationary Office: Dublin.

Willett WC, Stampfer MJ, et al. 1990 *Relation of meat, fat, and fiber intake to the risk of colon cancer in a prospective study among women.* N Engl J Med; 323:1664-72.

Chapter Six. The Food Chain: Retail and Supply.

A.C.Nielsen 1992 *Retail Census 1991.* A.C. Nielsen of Ireland Limited: Dublin..

An Bord Bainne 1991. Diary Extract.

An Bord Glas/Lansdowne Market Research Study. Lansdowne Market Research Limited: Dublin.

Andersen Consulting 1992 . *Grocery Distribution in the 90's. Strategies for Fast Flow Replenishment.* May 1992.

Central Statistics Office 1988 *Census of Services, Volume 1, Detail Results for Retail and Wholesale Trade incorporating non respondent estimates.* Government Stationery Office: Dublin.

Commission of the European Communities. Commission Recommendation of 29 March 1978 to the Member States on the use of saccharin as a food ingredient and for sale as such in tablet form to the final consumer. 78 / 358 / EEC. *Official Journal of the European Communities* - No. L 103 / 32. Brussels, 1978.

Commission of the European Communities. Council Directive of 18 December 1978 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs for sale to the ultimate consumer. 79 / 112 / EEC. *Official Journal of the European Communities* - No. L 33 / 1. Brussels, 1979.

Commission of the European Communities. Council Directive of 31 July 1981 concerning the prohibition of certain substances having a hormonal action and of any substances having a thyrostatic action. 81 / 602 / EEC. *Official Journal of the European Communities* - No. L 222 / 32. Brussels, 1981.

Commission of the European Communities. Council Directive of 24 July 1986 on the fixing of maximum levels for pesticide residues in and on foodstuffs of animal origin. 86 / 363 / EEC. *Official Journal of the European Communities* - No. L 221 / 43. Brussels, 1986.

Commission of the European Communities. Council Directive of 15 April 1987 on the indication of alcoholic strength by volume in the labelling of alcoholic beverages for sale to the ultimate consumer. 87 / 250 / EEC. *Official Journal of the European Communities* - No. L 113 / 57. Brussels, 1987.

Commission of the European Communities. Council Directive of 21 December 1988 on the approximation of the laws of the Member States concerning food additives authorised for use in foodstuffs intended for human consumption. 89 / 107 / EEC. *Official Journal of the European Communities* - No. L 40 / 27. Brussels, 1989.

Commission of the European Communities. Council Directive of 3 May 1989 on the approximation of the laws of the Member States relating to foodstuffs intended for particular nutritional uses. 89 / 398 / EEC. *Official Journal of the European Communities* - No. L 186 / 27. Brussels, 1989.

Commission of the European Communities. Council Directive of 24 September 1990 on nutrition labelling for foodstuffs. 90 / 496 / EEC. *Official Journal of the European Communities* - No. L 276 / 40. Brussels, 1990.

Kessler, D. 1989 The federal regulation of food labelling: Promoting foods to prevent disease. *The New England Journal of Medicine*, 321, 717-725.

Lansdowne Market Research- All Housewives Study. A Special Survey Conducted on behalf of Wilson Hartnell 1992. Wilson Hartnell Advertising Limited: Dublin.

RGDATA: Food 2000. Part1:The Shopper. Henley Centre Ireland, April 1993.

RGDATA: Food 2000. Part2:The Shop. Henley Centre Ireland, April 1993.

Thom, S. & Kulkarni, K. 1990 Labelling lingo: History and trends. *The Diabetes Educator*, 16, 489 - 496.

WHO Eurostat. Nutrition and Health Statistical Indicator Database 1993 maintained by World Health Organisation Regional Office for Europe.

Wilson Hartnell Advertising Ltd 1993 *The Irish market, facts & figures.* Wilsen Hartnell Advertising Ltd: Dublin.

1992 Food Labelling. *The Lancet*, 340, 423.

Chapter Seven. Dietary Intake of the Irish Population.

Barker, DJP.1992 *Relation of Infant Feeding to Adult Serum Cholesterol Concentration and Death from IHD. BMJ*, 304, 6830: 801-805.

Barker, A.1990 *Northern Ireland diet, lifestyle, and health study.* European Journal of Clinical Nutrition, 44, 813-817.

Clarke, U. 1993 *Assesment of mothers and children aged 12-18 years living on low incomes in Galway city council housing estates.* Report for community care office, Western Health Board Galway.

Cremin, FN., Morrisey, PA. 1976 Food consumption trends in Ireland. *Irish Journal of Medical Science*, 4, 18-25.

Cunningham, K. 1993 *Young People and their Food Choices.* Irish Nutrition and Dietetic Institute: Dublin.

Evans A.E., et al. 1990 Sources of Fat in the Northern Irish Diet. Rev. *Epidem.et Sante Publ*, 38, 545-560.

Fehily, A.M. et al.1993 Diet and incident ischaemic Heart Disease: The Caerphilly study. *British Journal of Nutrition*,69:303-314.

Fogarty, J., Nolan, G. 1992 Assesment of the nutritional status of rural and urban elderly living at home. *Irish Medical Journal, 8:14-16.*

Gibney, M. & Lee, P. 1989 *Patterns of Food and Nutrient Intake in a suburb of Dublin with chronically high unemployment.* Combat Poverty Agency Report series no. 2.

Haslett, D. 1988 *History of the Irish diet over the last 100 years.* Trinty College Dublin.

Irish National Nutrition Survey 1990 The Irish Nutrition & Dietetic Institute.

Kilkenny Health Project 1992 *A Pilot Programme for Coronary Heart Disease Prevention in Ireland 1985-1990*. Kilkenny Health Project.

Lowry, M., Lillis, DF. *1993 Infant feeding practices.* Irish Medical Journal, Jan. 1993 Vol 86 No. 1 pages 13-14.

MacSweeny, M. & Keveney, J. *Infant feeding practises in Ireland.* Irish Health Education.

Monica/Ectim Meeting Abstract. Queens University Belfast. April 1993.

O' Connor, M. et al. 1993 School nutrition survey. *Irish Medical Journal*, May 1993 Vol 86 No. 3.

Whelton, H., O' Keefe, J. & O'Mullane, D. 1991 *Childrens Dental Health, Co. Clare.*

Chapter Eight. The Social and Personal Factors influencing the Irish Diet.

Commission of the European Communities 1988 The Future of the European Food System. *The FAST II Programme Results and Recommendations, 1984-1987,_5*, 1-107.

Conroy, R. 1992. *The Attitudes Study.* Kilkenny Health Project 1992. p 29.

Changing Attitudes in Ireland 1991. A survey of attitudes in Ireland conducted by Behaviour and Attitudes Limited. Institute of Advertising Practitioners in Ireland

Dineen, B. et al. 1992 *Consumer food choice, socio-economic profile and retail provision in two Galway supermarkets serving different socio-economic areas.* Conference presentation: The Nutrition Society Irish Group Postgraduate Seminar Series, Galway.

Gormley, R. 1989 *Assessment of school meals and of growth, food intake and food likes/dislikes of primary school children in inner city Dublin schools.* Report Series No. 1

Kearney, M. & Gibney, M.J. 1993 *Dietary Beliefs and Practices*. Irish Nutrition & Dietetic Institute Annual Study Day.

Lowe, F. 1992. *Report of British Association for the Advancement of Science.* Annual meeting, Southampton 1992.

McCluskey, D. *Health - People's Beliefs and Practices.* Government Stationery Office: Dublin 1989.

Nolan B. 1991 *Utilisation and Financing of Health Services in Ireland.* The Economic & Social Research Institute, General Research series Paper No. 155.

O' Mullane, D. & Whelton, H. 1990 *Oral Health of Irish Adults 1989-1990.* The Oral Health Services Research Centre, University College Cork.

Irish Consumer Research Ltd. 1986. *The Irish Housewife-A Portrait. ICR Ltd, May 1986.*

Watson, T. 1990 *A Cospoir Research Report.*

Appendix A.1

Recommended Dietary Allowances

TABLE OF RECOMMENDED DIETARY ALLOWANCES

		AGE RANGES (YEARS)	REFERENCE WEIGHT kg	lb	REFERENCE HEIGHT cm	in	ENERGY MJ	kcals	PROTEIN* g	THIAMIN mg	RIBOFLAVIN mg	NIACIN mg	ASCORBIC ACID mg	$^{B}12$ µg	FOLATE µg	PYRID† -OXINE µg	VIT. A µg	VIT. D µg	VIT† E mg	CALCIUM mg	IRON mg	ZINC mg
CHILDREN	Infants	LESS THAN 1 YEAR	9	20	71	28	0.48-0.44 x kg	115-105 x kg	28-25 x kg	0.3	0.4	5	35	1.5	50	0.6	450	10	4	540	7	5
	Children	1-3	13	29	90	35	5.6	1300	33	0.5	0.7	8	45	2.0	100	0.9	300	10	5	800	8	10
		4-6	20	44	112	44	7.0	1700	43	0.7	0.9	10	45	2.5	200	1.3	300	10	6	800	9	10
		7-10	28	62	132	52	8.5	2000	51	0.8	1.1	12	45	3.0	200	1.6	480	10	7	800	10	10
ADOLESCENTS	Male Adolescents	11-14	45	99	157	62	11	2600	66	1.1	1.4	16	50	3.0	300	1.8	725	10	8	1200	13	15
		15-18	66	145	176	69	12	2900	72	1.2	1.7	19	60	3.0	300	2.0	750	10	10	1200	14	15
	Female Adolescents	11-14	46	101	157	62	9	2100	53	0.9	1.4	16	50	3.0	300	1.8	725	10	8	1200	14	15
		15-18	55	120	163	64	9	2100	53	0.9	1.7	19	60	3.0	300	2.0	750	10	8	1200	14	15
MEN	Sedentary	19-34	70	154	178	70	10.5	2500	63	1.0	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
	Moderately Active		70	154	178	70	12	2900	72	1.2	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
	Very Active		70	154	178	70	14	3300	84	1.3	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
	Sedentary	35-64	70	154	178	70	10	2400	60	1.0	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
	Moderately Active		70	154	178	70	11.5	2700	69	1.1	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
	Very Active		70	154	178	70	14	3300	84	1.3	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
	Moderately Active	65-74	70	154	178	70	10	2400	60	1.0	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
		75 +	70	154	178	70	9	2100	54	0.9	1.6	18	60	3.0	300	2.2	750	7.5	10	800	10	15
WOMEN	Most Occupations	19-54	55	120	163	64	9	2100	54	0.9	1.3	15	60	3.0	300	2.0	750	7.5	8	800	14	15
	Very Active		55	120	163	64	10.5	2500	62	1.0	1.3	15	60	3.0	300	2.0	750	7.5	8	800	14	15
	Moderately Active	55-74	55	120	163	64	8	1900	47	0.8	1.3	15	60	3.0	300	2.0	750	7.5	8	800	9	15
		75 +	55	120	163	64	7	1700	42	0.7	1.3	15	60	3.0	300	2.0	750	7.5	8	800	9	15
	Pregnancy (Second Half) ‡		—	—	—	—	10	2400	60	1.0	1.6	18	80	4.0	500	2.6	750	10	10	1200	15	20
	Lactation (First Six Months) ‡		—	—	—	—	11.5	2700	69	1.1	1.8	21	80	4.0	400	2.5	1200	10	11	1200	15	25

* Based on 75% biological utilization.
† These figures are based on USA 1980 figures and refer, in the infant range, to the 6–12 month age group.
‡ Refers to women in most occupations

Appendix A.2

Methods of Collecting Nutrient Intake Data

National Nutrition Surveillance Centre
Department of Health Promotion
University College Galway.

INTRODUCTION

The usual aim of any dietary survey is to discover the habitual intake of individuals. There are several methods available:

- PRECISE WEIGHING METHOD
- WEIGHED INVENTORY METHOD
- MENU RECORDS (QUANTIFIED)
- DIET HISTORY (USUAL INTAKE)
- MENU RECORDS (UNQUANTIFIED)
- DIET RECALL
- FREQUENCY QUESTIONNAIRES

The choice of a method for an epidiemiological survey, where dietary data must be obtained on hundreds of individuals, is influenced by several factors; the likely response rate, accuracy, and cost of the method per subject. Generally the more accurate the method the greater the cost, the greater the degree of subject cooperation that is required, and the lower the response rate.

Thus when selecting a method, a compromise may have to be reached between a high response rate and the collection of precise dietary information. However it may only be necessary to determine intakes of one or two nutrients. The method chosen will therefore depend upon the nutrients of relevance to the hypothesis since intakes of some nutrients can more readily be determined accurately than others.

Questionnaires may be used to assess usual diet, either recent or distant past, but are usually devised for completion by the subjects concerned without supervision. Questionnaires may be adequate to estimate intakes of certain nutrients eg. dietary fibre, sucrose and ascorbic acid which are present in only a few foods and the intakes of which tend to be less variable from day to day than those of some other nutrients e.g. fat. If recording methods are to be used, it is generally agreed that seven days are sufficient. Occasionally, periods of three days(two weekdays and one weekend day) or four days (two week days and two weekend days) have been used, since calculated nutrient intakes from these two records have been shown to be similar to those of seven day records. AT least one weekend day must be included in the survey period because nutrient intakes of weekend days may differ greatly from those of weekdays.

1 PRECISE WEIGHING TECHNIQUE

This is the nearest approach to an assessment of actual current intake. It involves weighing all the ingredients used in the preparation of dishes; the inedible wastage,the cooked weight of the individuals portion, and the plate waste.

Nutrient intakes can then be determined by chemical analysis of aliquot samples. The investigators usually have to do the weighing and recording. Most suitable application is to small groups of volunteers.

Basic Assumption:- is that what is weighed is a true picture of the diet pattern.

Subjects Cooperation:- must weigh or have weighed all ingredients and all foods and leftovers.

Investigator/Fieldworkers time: largely spent on supervision of subject. It is hard to have more than one subject under study at a time. A small proportion of time is spent on coding and preparing forms. Laboratory facilities are needed for food analysis.

2 WEIGHED INVENTORY METHOD OR WEIGHED INTAKE

This method measures present intake. It has been successfully carried out by the subjects themselves, with minimal supervision by the investigators and is less onerous than the precise weighing method. The foods, prepared and cooked as necessary are weighed immediately before consumption. Subjects are provided with a notebook and a scale of sufficient capacity to accomodate the weight of a dinner plate plus the food, yet sensitive enough to register a teaspoon of sugar or the amount of butter on a slice of bread. The weight of the plate is first recorded, followed by cumulative weights as each item is served onto the plate. Leftovers are also weighed and recorded. Nutrient intakes can be calculated with the aid of food composition tables. Standard food tables include nutrient calculations for many cooked dishes, but there is some loss of accuracy when only the total cooked weights are recorded for 'composite' or mixed dishes.

One disadvantage of the method is the problem of meals consumed away from home, which may not be possible to weigh. In these cases, subjects should be asked to give a complete description of the meal and to estimate the quantities in household measures. For snack items such as cakes or filled rolls,subjects could be asked to state the place of purchase so that a sample can be bought and weighed. If only energy and energy yielding nutrients are to be assessed, a seven day record is sufficient, if an accuracy of +/- 10% standard error is acceptable.

Vitamins, minerals, and fibre require longer periods of observation, at least 14 days. These do not have to be obtained over a single period of time and 4 records each of 4 days duration would be an acceptable compromise. People with stable food habits, and therefore with lower than average within person coefficients of variation can be observed for shorter periods while longer investigations are necessary in those with erratic eating patterns in order to obtain a satisfactory level of precision. The information should be coded within a

few days of collecting the record.The reasons for this are firstly,that since cumulative weights are recorded, it is not always apparent during the home visits that weights for some items may seem unbelievably large or small. Secondly, it is possible that a missing detail about an item was not observed at the final visit. Coding of the data within a few days will thus enable clarification of these points by questioning the subject further.

Basic Assumptions:- that no change is made to the diet pattern because food is to be weighed.

Subjects Cooperation:- must be very high. This is likely to lower the response rate considerably in any sample.

Investigators/Field workers time:- Time spent in supervision varies with subjects. It can be very low once subjects are found to be competent and happy on their own, or can be very high if they don't understand or provide good records without support. Most time is spent in getting information on recipes, commercial foods, etc. as well as preparing the data for analysis.

3 UNWEIGHED FOOD RECORD (Menu Records Quantified)

From a subjects point of view this method is slightly less invasive, and hence a more acceptable method of assessing dietary intake than the Weighed Intake method It is a record of present intake kept by the subject. Foods eaten are described and amounts described or estimated in terms of portions, or of household measures. Sometimes food photographs are used. These amounts then must be converted into weights by the investigator/fieldworker. Standard measures(cup, spoon etc.)can be given to the subject, the fieldworker can have actual or sample portion sizes shown to them, which can be weighed. This method has been widely used over varying periods of time from 1 day up to a month, but rarely more. The method has been compared with many other methods and it appears to give as good information on groups as the more onerous weighed methods.The disadvantage of this method is that subjects vary in their ability to estimate portion sizes. There is also a sex difference, women being more competent than men in this regard.

Basic Assumptions:- Diet pattern is not changed because it is being recorded and is accurately reported, and that estimates of amounts are valid.

Subjects Cooperation:- A small amount of time needed(after each meal preferably) plus some time with field worker to check record for completeness.

Investigators/Field workers time: some supervision needed to check record for completeness, the rest of the time is spent collecting information to translate portion descriptions into weights and preparing forms for analysis.

4 MENU RECORD UNQUANTIFIED.

This method describes food actually eaten,and is recorded by the subject if literate. It can be returned by mail or collected by a field worker, and is a much less demanding method of assessing present intake. Supervision is not necessary. It gives information only on pattern of eating and frequency of use of foods and so is very limited. Such information has been shown to be valid enough to identify the extreme quarters or thirds of a distribution in terms of some foods, but is less valid for nutrients.

The usefulness of this method lies in the fact that over a period of time the series of records will give information on frequency, and it requires little of the subjects time. It can be a useful basis for nutrition education.

Basic Assumptions:- that all foods are eaten as usual, are recorded, and are described accurately.

Subjects Cooperation: Requires up to 15 minutes a day to complete record and has been maintained over a year.

Investigator/Field Workers Time:Involves collection, checking, and coding of forms, but minimal supervision of subject.

5 DIET HISTORY

The most important, and most commonly used, method in clinical work is the diet history which aims to assess the usual nutrient intake by means of dietary questioning.A full dietary history may take as much as 1.5 hours to complete properly, although a shortened version is often adequate for the purpose of advising on dietary modification.

Subjects recall their past intakes and are cross- questioned in detail, and they may record present intake in the form of menus. This method has been used in small studies where cooperative subjects have been seen on several occasions and followed prospectively.

A single modified history has also been taken from several hundred subjects for prospective study. The method demands a detailed interview and a well trained interviewer, and is affected by interaction between interviewer and interviewee and the subjective interpretation of questions and answers. Quantities consumed have to be estimated. The period of time it covers has ranged from lifetime history to a few months. Extrapolation to long periods is of dubious validity.

Basic Assumptions: Memory, aided by probing can provide a quantitive picture of the dietary pattern. This method cannot work with people who do not have a reasonably regular dietary pattern.

Subjects Cooperation: one interview is needed, and can be done anywhere.

Investigators/Fieldworkers time: largely spent interpreting the interview.

6 "24 HOUR" RECALL.

In this method subjects are asked to recall all food and drink consumed over the previous 24 hours, using food models or measures to describe quantities eaten. Food descriptions must be elicited that are suitable for the purposes of the study, and adapted to local food tables. The 24 hour recall method has been widely used in cross-sectional surveys to categorise groups of people, and several studies comparing it with other methods have been made. It is recognized that 1 day will not be representative of a subjects usual intake. Repeated 24 hour recalls appear possibly to be useful for categorising individuals.

The usefulness of 24 hour recall method is as a good lead-in to other methods. Generally it is used to assess intake of large (100+) groups but not of individuals.

Basic Assumptions:- That memory can be prodded into recalling all that was consumed the previous day and that remembered amounts are reasonably accurate.

Subjects Cooperation:- 15-30 minute interview which can be done anywhere.

Investigator/Fieldworkers time:- Many subjects food intake can be assessed in a day. Time is needed to translate reported amounts into weights.

7 SHORTENED INTERVIEW/FREQUENCY.

For large scale epidemiological surveys, a shortened interview has been tested. The subjects recall the frequency of consumption of certain foods. Favourable results have been reported when validated against the more detailed history. It needs to be related to a specific period of time and perhaps allow for seasonal variation of food intake.

This methods usefulness lies in reporting particular nutrient intake deficiencies, but mainly useful for large (100+) groups.

Basic Assumptions::- that the subject accurately remembers how often certain foods were eaten in the past, and supposes that there was a certain regularity of pattern.

Subjects Cooperation:- Only a quick easy interview is needed if a fairly regular dietary pattern exists.

Investigator/ Fieldworkers time:- Many interviews can be done in a day anywhere.

VALIDITY

THE validity of a method is the extent to which it measures what is intended. This is particularly difficult for surveys assessing nutrient intakes, since validation requires that the truth be known. The DIET HISTORY and 24-HOUR RECALL methods are those most frequently used in epidemiological surveys. Absolute validation of the diet history (an assessment of usual intake) is impossible, since the true usual intake cannot be determined. The 24-HOUR recall can be validated on one level if the actual intake is measured by an independent observer, but for periods much longer than this the practical problems become too great. A demonstration of validity at this level, while necessary is not sufficient. It must be coupled with a demonstration that the 24-HOUR RECALL accurately reflects the usual diet of an individual or group over an extended time period. Hence the method cannot be truly validated.