REGIONAL VARIATION IN THE SCOTTISH HEALTH SERVICE
1951 - 1976
AN ANALYSIS OF PUBLIC POLICY

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Abstract

This dissertation examines the success of the National Health Service in Scotland in achieving the goal of regional equality. An historical analysis provides some indication that regional disparities have characterised the Scottish Health Service in the twentieth century. The data from 1951 to 1976 demonstrate the failure of the SHS to meet the policy objective in the recent past. An output policy model is developed to facilitate an explanation of persistent regional variation. The government structure, socio-economic and health status variables successfully explain a large percentage of the variation which exists between Health Board Regions. The most powerful of the independent variables is the nature of the policy process. The evidence presented in the thesis indicates clearly that the predominant policy process in existence within the SHS over time is incrementalism.

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Chapter I

Introduction

There are a wide variety of approaches to the study of public policy[1] and a large number of models of the policy-making process[2]. The study of policy is becoming increasingly popular in the social sciences. King defines policy as a " consciously chosen course of action (or inaction) directed toward some end "[3]. This definition is particularly useful because it implies that policy can be evaluated in terms of the extent to which it achieves the objectives set for it by the policy-maker. Thus " an objective evaluation of a program's success relies not on public opinion, but on a careful evaluation of how certain policy goals match up with actual accomplishments "[4]. If one is to attempt to evaluate the success of the National Health Service in Scotland, one must first examine and specify the goals which the National Health Service was created to achieve.

The White Paper of 1944 addressed itself to this issue. It stressed the need to provide a comprehensive health service. " The proposed service must be comprehensive in two senses - first, that it is available to all people and, second, that it covers all necessary forms of health care."[5] Eckstein saw them as part of

an effort to rationalise the organisation, distribution and delivery of health care throughout the state.[6] Other " activity "[7] goals were also specified.

This project concerns itself with the first objective indicated above; viz., the desire to create a system which would equalise access to health care. Equalised access involves two major factors.

> I think the two main principles associated with the bill, are first, the granting of the best possible medical service to every member of the community, irrespective of the size of the purse; and secondly, a proper allocation of the medical skill of the country so that we can have an organisation which will bring the patient close to the medical chiefs, without the haphazard gambling that goes on at the moment.[8]

In the National Health Service Act of 1947 and the National Health Service (Scotland) Act of 1947 and in the parliamentary debates on the subject, the government stressed its desire to remove the income and geographic barriers which impeded the ability of some citizens to obtain good medical care.

At the second reading of the National Health Service Act, the Minister of Health, Mr. Bevan, explained the reasons for making the health service free.

> ...it has been the firm conclusion of all parties that money ought not be permitted to stand in the way of obtaining an efficient health service .... It is cardinal to a proper health organisation that a person ought not to be financially deterred from seeking medical assistance at the earliest possible stage.[9]

Although charges have been levied for prescriptions, spectacles and dental treatments and these have been controversial issues, it is fair to suggest that for most of the services provided by the National Health Service there are no direct charges to the public at the point of need.

The desire to achieve geographic equality in health care resources was a more contentious issue because it involved more intensive and extensive control over the medical profession by the government. Although the White Paper had presented clearly[10] the reasons why such control was required, Mr. Bevan argued the government's position even more forcibly.

> ...our hospital organisation has grown up with no plan, with no system; it is unevenly distributed over the country and, indeed, it is one of the tragedies of the situation that very often the best hospital facilities are available where they are least needed. In the older, industrial districts of Great Britain, hospital facilities are inadequate.[11]

Mr. Bevan went on to point out that:

> the distribution of general practitioners throughout the country is most hurtful to the health of our people. It is entirely unfair and, therefore, there must be brought about a redistribution of the general practitioners throughout the country.[12]

In the debate on the Scottish legislation, even greater attention was placed on the need to deal with the problem of regional inequalities within the health services. The government recognised its obligation

of " special consideration of circumstances in the Highlands and Islands " [13], which resulted from the Dewar Report of 1912 and the subsequent creation of the Highlands and Islands Medical Scheme. [14] The Secretary of State made it clear that " in order to improve the distribution of doctors throughout the country, there will be provision for disbarring doctors from entering the Service in an area already adequately covered " [15].

Both the National Health Service Act of 1947 and the National Health Service (Scotland) Act of the same year contained provisions to achieve these two important objectives of removing income barriers and equalising the regional distribution of health care resources. Section I, paragraph 2 of both statutes declared that, subject to the minister's discretion, the " services so provided shall be free of charge ". The acts charged the relevant ministers with the responsibility of providing hospital and specialist services to meet all reasonable requirements. Paragraphs 34 and 35 and 35 and 36 of the National Health Service Act and the National Health Service (Scotland) Act, respectively, established the mechanisms designed to control the mobility of general practitioners. Paragraphs 43 and 44 of the two statutes, respectively, provided the appropriate minister with the authority to intervene to ensure the proper regional distribution of general practitioners, dentists and pharmacists in the country.

Although both aspects of this fundamental objective of the NHS have been subjected to debate and research, most of the effort has focussed upon social class barriers to health care. In general, both issues have been more frequently and more thoroughly investigated in terms of the NHS in England and Wales than in the case of the Scottish Health Service.

The studies dealing with social class and the NHS have focussed upon three major themes. These are mortality and social class [16], morbidity and social class [17], and utilisation and social class [18]. All of these studies for England and Wales tend to come to similar conclusions. As one descends the social class classification, the morbidity and mortality rates increase and utilisation tends to decrease. The relatively fewer studies of this type for Scotland [19] tend to come to the same conclusions as the English and Welsh studies.

The second aspect of the basic objective of the NHS has received relatively less attention. Recently, A. J. Culyer has argued that " the first attempts systematically to examine the regional availabilities of NHS resources was made as late as 1970 " [20]. Although there have been a few earlier studies of regional variation in the National Health Service, most of the research on this topic has taken place in the last decade.

These studies tend to define National Health Service resources in three ways - medical staff, hospital beds and health care expenditures. The results of each of the studies done for England and Wales produce broadly similar findings.

J. Jewkes and S. Jewkes [21], A. Maynard [22], A. Maynard and R. Tingle [23], M. Cooper [24], Which [25], and M. Cooper and A. J. Culyer [26], have examined variations in the provision of a number of different types of hospital beds per standardised population base for England and Wales. Each of these studies demonstrates considerable variation between regions in the number of hospital beds per capita available to the public.

J. Jewkes and S. Jewkes [27], J. Last [28], J. Butler [29], Which [30], M. Cooper and A. J. Culyer [31] have examined the regional variation of standardised general practitioner population rates. A. J. Culyer and M. Cooper [32], A. Maynard [33], J. Last [34], and Which [35] investigated regional variations in the number of hospital consultants available per standardised population base. S. Jewkes and J. Jewkes [36], and P. Cook and R. Walker [37] have examined the regional differences in the standardised population rates of dentists. All three sets of studies agree that they " have not been able to find much evidence that inequalities have been decreasing " [38].

S. Jewkes and J. Jewkes [39], M. Cooper [40], Which [41], M. Cooper and A. J. Culyer [42], J. Noyce, A. Snaith and A.

Trickey [43], and M. Buxton and R. Klein [44], have studied regional variation in terms of health care expenditures per capita. These studies all reveal " a substantial variation in expenditures per head " [45].

Although the nature and extent of regional variation in the National Health Service has been well documented for England and Wales, the same is not the case for Scotland. Apart from a rew references about the provision of dental care in Cook and Walker [46], there is no published study of this subject which pertains to the Scottish situation.

This is particularly surprising in view of the efforts to reorganise the Scottish Health Service and in view of the increasing awareness of the important problems created by regional inequalities in the distribution of health care resources.

When he was Minister of Health for England and Wales, Mr. Crossman claimed that the regional disparaties were " so big that there was no easy way of aiding underprivileged areas with a major legitimate grievance without cutting back on the more favoured areas " [47]. On another occasion, Mr. Crossman elaborated on the problem.

> If we look, for instance, at the level of service which a Londoner can get and which somebody in Sheffield can get, they are poles apart. Measured in terms of access to a G.P., or in access to hospital, or standards of nursing, the

> Londoner does far better....I can only equalise on an expanding budget. Therefore, unless the Health Service budget rises steadily, and unless the percentage of the GNP allotted to it is steadily increased, I cannot level up the backward regions and the gap remains. And I'm bound to maintain those very good hospitals in London. So the vast amount of my construction work will go into those hospitals and not into building new hospitals outside. [48]

Dr. Cochrane has argued that " the NHS has gone a long way toward reducing ' social class ' inequality " [49] and that " there are, however, some other more obvious types of inequality where some action might be taken to reduce it. For example, the gross inequalities between regions " [50]. From this perspective it seems quite logical for the Department of Health and Social Security and the Welsh Office to take steps to alleviate the situation. The Report of the Resources Allocation Working Party and the Report of the Steering Committee on Revenue Allocations in Wales which developed weighted population models as a base for revenue allocation to the regional health boards, provide the basis of a policy designed to achieve greater equality.

The response of the Scottish Home and Health Department is somewhat more questionable. The Department established a Working Party on Revenue Resource Allocation which attempted to " provide the basis for an equitable distribution of revenue funds to health authorities over the next decade " [51]. Although there is " little doubt

in the minds of Health Board Treasurers generally that regional variations in the pattern of the service have been caused very largely by the system of distributing resources " [52], there appears to be no evidence which shows that there is a need for a policy designed to reduce regional inequalities in the Scottish Health Service.

This research project evaluates the Scottish Health Service by examining its success in achieving the objective of regional equality in the provision of health services. Specifically, the research attempts to determine if meaningful variation in health care expenditures, manpower, and facilities does exist and if regional inequality has been a major feature of the Scottish Health Service from 1951 to 1976.

If the project is successful, it will have accomplished for the NHS in Scotland what several studies in analysing territorial justice in the geographic distribution of NHS resources in England and Wales have done previously.

If regional disparities are a strong feature of the Scottish Health Service, then it is important that the research project go one step further. None of the studies of the situation in England and Wales have attempted seriously to explain why such variations between regions do exist. This project attempts to do so for Scotland.

Sharkansky argues that this concern for explanation reflects one of " several new dimensions of policy analysis " [53]. Dye makes the case even more strongly. He argues that " policy ... like election returns, roll-call votes or court decisions, must be assembled, described and explained " [54]. He claims that " a central problem facing students of...politics is not only describing the great variation in policy...but, more importantly, explaining these policy differences " [55]. Thus the second major focus of this research project is " concerned with progress toward the scientific explanation of why policies vary from one part of the country to another " [56].

Chapter II

Regional Variation in the Scottish Health Service 1900 to 1976: A Review of Selected Documents and Reports

Introduction:

In this chapter we attempt to examine some aspects of the regional distribution of health care facilities, staffing and expenditures in Scotland in the twentieth century. Traditional sources such as Annual Reports of the Department of Health for Scotland, advisory committee reports, Royal Commission reports and some secondary sources provide the basic information. This exploratory survey of some major aspects of health care in Scotland has three fundamental goals.

The examination of regional variation prior to the creation of the National Health Service may enable us to determine if policy variation was as extensive as the Secretary of State for Scotland and other M.P.s suggested during debate on the National Health Service (Scotland) Act. If the evidence suggests that policy variation between regions had been considerable, then the goal of regional equality would seem to be a sensible one at first glance.

The examination of policy variation during the period 1948 -1976 may allow us to come to some tentative

conclusion regarding the effectiveness of the National Health Service in Scotland in achieving this objective. It should also provide some indication of whether or not regional variation has been a continuing feature of health care in Scotland for a considerable period of time.

If this exploratory chapter indicates that there has been both extensive and continuing variation, then it supports the arguments presented in the introductory chapter regarding the need to examine the subject systematically and to attempt to develop some explanation of why this phenomenon is so persistent.

The chapter is organised into two main sections- the 1900 - 1947 period before the NHS was established in Scotland, and the 1948 - 1976 period. Within each section a brief examination of major features of the health service in Scotland is presented. No effort is made to provide a comprehensive, detailed historical description of health care services in Scotland during the period. Rather the chapter provides only sufficient information to allow us to come to tentative answers to the questions raised above.

The Pre-NHS Period 1900 - 1947:

In this section we examine some features of the three major aspects of health care in Scotland during this period. Primary care is studied by analysing the regional distribution of general practitioners throughout

the country. Local authority schemes are discussed in terms of provision of care for mothers and young children, pre-school children and the school health service. Finally, the hospital and specialist services provide an indication of regional variation in the provision of hospital facilities and staff by both local authorities and voluntary hospitals.

The Distribution of General Practitioners:

Ferguson points out that even before the turn of the century there was considerable variation in the distribution of general practitioners. He finds, for example, that even between the large cities of Edinburgh and Glasgow there were major differences, with one general practitioner per 2,250 people in Glasgow and one general practitioner per 1,000 population in Edinburgh in 1880. [1] By 1893 the County Medical Officer in Inverness could express his concern over the scarcity of medical men in the Highlands. [2] Ferguson claims that by the turn of the century " large tracts of the country were without medical men " [3].

Although significant efforts were made to improve this situation in the first quarter of the twentieth century, the accounts provided by the National Health Insurance expenditures, which were published by the Scottish Board of Health in 1924, indicated a continuing problem of regional variation. In Aberdeen, for example, the

general practitioner expenditures per 1,000 population were £353.3.In Bute the corresponding figure was £412.3 [4]. By 1928, the Board reported a similar picture. In Aberdeen the expenditures on general practitioner services per 1,000 insured population were £453. In Bute the corresponding figure was £528. [5] Even the tremendous success of the Highlands and Islands Scheme which was established in 1913 did not resolve the problem of scarcity of general practitioners in the Highlands. In its Seventh Annual Report, the Scottish Board of Health noted that more medical practitioners were needed in the Western Isles. [6]

By the 1930's, the newly created Department of Health for Scotland was able to provide some evidence regarding the number of general practitioners by county. In 1930 there were 3.42 general practitioners per 10,000 population in Aberdeen. The corresponding figures for Argyll, Bute and Wigtown, respectively, were 6.76, 4.77 and 5.09. [7] By 1935 there were 5.52 general practitioners per 10,000 population in Bute. The corresponding figures for Aberdeen, Argyll and Wigtown were 3.54, 6.80 and 5.04, respectively. [8] By 1938 Argyll had experienced a major improvement in the provision of general practitioner services. In that year there were 7.14 general practitioners per 10,000 population in Argyll as compared with 3.25 in Aberdeen, 5.43 in Bute and 5.04 in Wigtown.[9] The

Cathcart Committee noted the regional differences in the availability of general practitioner services in the 1930's. It pointed out that " medical treatment and supervision of illnesses...are least available where they are most needed " [10].

During the war years, this geographic distributional imbalance continued. In some areas the shortage of general practitioners was so severe that routine examinations of intermediate age school children as part of the School Health Service had to be abandoned. [11]

One finds similar regional variations in the development and operation of the School Health Service in Scotland during this period. It is to this aspect of health care that we turn in the next section.

The School Health Service:

The 1908 Education (Scotland) Act made local education authorities responsible for the medical examination and supervision of pupils. The Act also allowed these authorities to hire medical and nursing staff and to provide school meals where it was deemed to be appropriate. The 1913 Education (Scotland) Act allowed the school authorities to provide facilities to treat " necessitous " pupils. The later Education (Scotland) Acts such as those passed in 1930, 1942 and 1945, broadened the scope of the School Health Service and required that local education authorities

provide medical treatment for pupils whose parents were unable to do so. Despite these developments, many areas provided only limited schemes and found themselves unwilling or unable to carry out all of their responsibilities in this regard.

Although Glasgow established the first school clinics in 1912, many areas did not follow such a pattern.[12] In fact, the Sixth Annual Report of the Scottish Board of Health noted that in approximately 20 percent of the areas, not all age groups were subjected to the routine medical examination.[13] It pointed out that the interpretation of necessitous children varied widely from area to area, [14] and that in some areas the School Health Service was not sufficiently developed to cope with even the basic elements required by law.[15] In fact, a year later in 1926, the Board found that in some areas, there was no systematic examination of school children at all. [16] By the end of the decade, the situation had not improved greatly. In its final Report in 1929 the Board pointed out that two education authorities in Scotland provided no facilities for the treatment of pupils [17] and that in three areas, only the service of part-time medical and nursing staff was used to provide a limited service for students. [18]

The Board had noted earlier that dental care in the School Health Service varied dramatically from region

to region. In its Sixth Annual Report, it noted that five areas provided absolutely no dental services for school children. [19]

In the 1930's the situation did not improve to any major extent. In 1930 the Department of Health for Scotland found that although the School Health Services were reasonably well-developed in the urban centres, the rural areas were considerably slower in such development. [20] These larger urban authorities developed orthopaedic clinics and audiometric hearing test centres for pupils. The rural areas were unable or unwilling to do so. [21]

In addition, the problem of interpretation of necessitous child remained unresolved. The Cathcart Committee points out that " poverty is not defined in the statutes and, accordingly, the interpretation varies from area to area; it may vary also in any one area from time to time " [22].

Even in a matter as straightforward as the provision of school meals, the Committee found considerable variation in practice. Within the Highlands and Islands and rural areas, some education authorities made arrangements to provide school meals, but others made no effort to offer this service. [23]

In its Sixth Annual Report the Department of Health noted that there was considerable variation in the availability of dental services for school children.

" In a few areas, there was one dentist for approximately 5,000 children, and in others, only one dentist for 20,000 - 30,000 children." [24] Four years later, in 1939, the Department noted that the provision of dental services for school children ranged from one dentist per 2,000 children in Shetland to one dentist per 20,000 children in Glasgow. [25]

During the war years, the evidence suggests that some areas were more affected than others in terms of the availability of medical and nursing staff for the School Health Service. In several areas, the activities involved in the School Health Service had to be curtailed; in other areas, the Service continued unchanged. [26]

Although the School Health Service provided medical examination and treatment for pupils and the National Health Insurance system provided medical and supplementary benefits for employed workers, there was a recognition during this period that more attention should be paid to the medical problems of mothers and infants and pre-school children.

Mothers and Young Children's Medical Services:

The depressingly high infant and maternal mortality rates in Scotland during the period prompted the government to take a number of initiatives in an attempt to improve the situation. The 1902 Midwives (Scotland) Act attempted to improve the training of midwives. The

Notification of Births (Extension) Act of 1915 empowered local authorities to attend to the health of children and expectant mothers. The Maternity and Child Welfare Act of 1918 authorised local authorities to erect hospitals for maternity and child care. The 1927 Midwives and Maternity Homes (Scotland) Act required local authority licencing of maternity homes. The 1937 Maternity Service (Scotland) Act required local authorities to provide midwives and facilities for the examination and treatment of women during and shortly after their pregnancies, medical supervision during the lying-in period and to arrange for obstetric services for patients if these were likely to be necessary.

The same pattern of regional variation in the interpretation and application of these statutes regarding health care for mothers and infants as occured in the other elements of health services in Scotland quickly developed.

Despite the passage of the 1902 Midwives (Scotland) Act, improvements in the training of midwives in some areas did not take place for a considerable period of time. Ferguson noted that in rural areas of Scotland, there was no organised midwifery service in 1914 and that in many cases, the assistance of the local " handywoman " was relied upon. [27]

By 1925, the Board of Health could claim that

most areas outside the Highlands and Islands had developed Maternal Welfare Schemes. [28] Even in the areas which had schemes, however, there were few maternity clinics and the Board argued that a great deal of development of that type was needed. [29]

By 1926 the Board described the situation as one in which 92 percent of the total population was covered by a variety of schemes. [30] 13 out of 14 women had access to some type of local authority programme. [31] Even as late as 1929, however, the Board found that in many areas of the Highlands and Islands, there were not any organised local authority maternity schemes. [32]

By 1930 the Department of Health for Scotland reported that 93 percent of the total population had access to local authority maternity schemes. [33] It pointed out that the patterns varied even between the larger cities. In Glasgow, for example, 50 percent of the births were attended by midwives; whereas, in Dundee, midwives attended only 40 percent of all births. [34]

In the following year, the Department elaborated upon the variety of types of schemes in operation in different areas. In the large towns and cities, the schemes were based upon health visitors and centres. [35] Glasgow had 13 pre-natal centres. Edinburgh, Aberdeen and Dundee had 6, 3, and 2 pre-natal centres, respectively. [36] In the rural areas, the " whole responsibility...was

thrown upon home visitation " [37].

By 1932 Edinburgh apparently did not feel such a great need to use midwifery services. Only 5 percent of the births in that city were attended by midwives as compared to 40 percent in Glasgow. [38] To some extent, this can be explained by the construction of local authority maternity hospitals. By 1932 there were twelve of them in Scotland. [39]

The Department of Health for Scotland recognised that the basic schemes varied " according to the circumstances of each area " [40]. In practice, this meant that although by 1933 all areas except one had organised maternity schemes, " these schemes differed from each other in completeness and also to some extent in character " [41]. Despite the increase in maternal care, the Department felt that it was " impossible to avoid the conclusion that in all areas of Scotland, many women do not obtain obstetrical services of the amount and quality necessary to safeguard them to the maximum extent " [42].

By the end of the 1930's, the Department was forced to accept the situation in which maternity and child welfare centres were not practicable in the rural areas. [43] Unfortunately, it also noted that there was a shortage of maternity beds in hospitals and nursing and maternity homes in the north and south-west. [44] At the same time, it recognised that different practices prevailed in different areas in such matters as medical attendance on

maternity cases. [45]

During the war years the situation regarding the provision of organised services for the care of mothers and infants appeared to have deteriorated. In 1942 eight local authorities did not have maternal welfare schemes of any kind. [46] By 1944 seven local authorities failed to develop organised maternal welfare services at even the most basic level. [47]

Evidently, the government had made major efforts to develop services which would improve access to medical treatment for schoolchildren, mothers and infants. Not all areas offered the schemes and even those which did, provided services which differed considerably from each others. By the 1920's, however, it was obvious that the provision of care for pre-school children from one to five years of age was inadequate.

Health Care for the Pre-School Child:

Towards the end of the 1920's, the Board of Health focussed attention on the fact that few existing schemes provided " adequate health supervision of the child between one and five years of age " [48]. In 1928 it pointed out that " over the country as a whole, the provision for the care of these children is not very satisfactory " [49]. In 1929 it noted that " except in the large towns, there is less attention paid to

the young child than any other class of the population " [50]. By 1930 only one third of the children aged one to five were under the health supervision of maternity and child welfare schemes. [51]

The Department of Health for Scotland raised the issue in 1930. Together with the Scottish Education Department, it issued a circular urging " a full development of services for the protection of the health of children under school age " [52]. By 1935, the Department reported a " meagre " response to the appeal. [53]

In the 1930 - 1935 period, the Department argued that " in the rural areas where centres are not available, there is required an improved health visitor service to secure systematic home visitation " [54]. In some areas of the country, children had access to clinics, health visitors and specialised hospital facilities. In other areas, only relatively under-staffed health visiting schemes were available.

Fife's Medical Officer argued in 1935 that there was inadequate provision for the pre-school child. [55] Lanarkshire possessed a serious shortage of hospital beds for sick children. [56] In some areas, children were able to obtain ultra-violet treatment for a variety of disorders. In other areas, such equipment was unavailable. [57]

During the 1940's, prior to the creation of the National Health Service, the situation did not change dramatically. Some areas of Scotland had elaborate and sophisticated services for young children; some areas provided basic medical treatment facilities and staff only; some areas did not offer any reasonably satisfactory scheme to respond to the need to provide medical care for pre-school children. [58]

Although the official position of the Department of Health was to deplore both the extent of the variation of services and the inadequacy of services for some groups of the population, it expressed its most serious concern about the state of hospital facilities in Scotland.

Hospital and Specialist Services:

In Scotland, as in England, there were two distinct elements involved in the provision of hospital services. The local authorities were responsible for the provision of treatment facilities for such illnesses as infectious diseases. The voluntary hospitals tended to concentrate on acute care and provided most of the specialist consultants available in Scotland. [59] By the 1930's it was recognised that co-operation and co-ordination of effort between these two groups was necessary if the hospital were to be able to respond adequately to the demand for treatment.

Although this co-operation did emerge, the somewhat different roles of the two types of hospitals did spring from an important pattern of the past which continued to have an impact upon the organisation of the hospital services prior to the creation of the National Health Service. By 1934 local authorities provided 18,679 beds, primarily for infectious diseases, chronic illness and the sick poor. The voluntary hospitals provided 12,575 beds, primarily for general medecine and surgery, sick children and treatment of other acute conditions. [60]

For this reason it has been considered appropriate to subdivide this section into three sub-sections. The first sub-section examines regional disparities in the provision of local authority hospital facilities for the treatment of infectious diseases, especially tuberculosis. The second sub-section presents evidence regarding other types of hospital provision which relate to the voluntary hospitals and the overall patterns of hospital care in Scotland from 1900 to 1947. The final sub-section points out the considerable variation in the availability of specialist treatment in a number of Scottish regions during this period.

Local Authority Infectious Disease Hospital Provision:

Local authorities were subject to a number of statutes which prescribed their responsbilities with

regard to the provision of hospital treatment. The most important of these was the 1897 Public Health (Scotland) Act which gave the Local Government Board the power to force local authorities to build and operate infectious disease hospitals. In 1906 pulmonary tuberculosis was listed as an infectious disease under the Act and in 1914 all forms of tuberculosis were listed as notifiable diseases. The Notification of Births (Bxtension) Act of 1915 and the Maternity and Child Welfare Act of 1918 empowered local authorities to build hospitals for the care and treatment of pregnant women, infants and children. The 1929 Local Government (Scotland) Act empowered local authorities to build and operate general hospitals. By the mid 1930's only four authorities - Edinburgh, Dundee, Aberdeen and Bute - had taken advantage of this opportunity. [61] Although the local authorities could and did make hospital facilities available to treat illnesses other than infectious diseases, the prevalence of infectious disease, especially tuberculosis, and the documentation of responses to the incidence of infectious disease, provide a reasonable base of information from which to build a reasonably accurate assessment of regional variation in local authority hospital provision.

In 1904 there was a serious outbreak of smallpox in Scotland. Ferguson noted that " many local authorities

were still without adequate resources for dealing with the disease " [62]. The situation in Lewis was particularly distressing because infectious diseases seemed to be endemic to the area. [63] Medical observors felt that the problem was exacerbated by the " want of proper... hospital provision " [64] on the island.

Although pulmonary tuberculosis was listed as a notifiable disease in 1906, by 1907 only nine local authorities were equipped to carry out their responsibilities. [65] Some of them had gone so far as to set aside beds for phthisis cases in infectious disease hospitals. [66] As late as 1909 the Royal Commission on the Poor Laws had found that only about 20 percent of the population were covered by the compulsory notification provisions regarding pulmonary tuberculosis. [67]

The Department of Health for Scotland reviewed the situation in 1930 and pointed out that, up to 1912 arrangements by local authorities to deal with their responsibilities to treat tuberculosis patients were few and far between. [68] The Board of Health for Scotland had earlier noted that by 1911, only 60 percent of the population were covered by the compulsory notification provisions. [69]

In 1921 the Highlands was " still sparsely populated with beds " for the treatment of tuberculosis. [70] In 1926 the Board of Health decried the fact that there

was no tuberculosis sanatorium in Shetland, even though such a facility was badly needed. [71] By 1929, the gap between the after-care of infectious disease patients in the Highlands and Lowlands of Scotland was actually widening. [72]

In the 1930's there was no evidence to suggest that the gaps were being reduced. The Department noted that in some areas, there was " an outstanding need for more beds " [73]. The Cathcart Committee noted that tuberculosis sufferers could not take advantage " of specialised skill and equipment in all parts of Scotland " [74]. It was admitted that there were some areas in the more remote parts of Scotland where arrangements could not be made to carry out the essential X-ray work involved in dealing with tuberculosis. [75]

Even in the 1940's the regional differences continued. By 1943 only three areas, Edinburgh, Glasgow and Lanark, possessed mass radiography equipment. [76] The Scottish Hospitals Survey provided more detailed information which supported the impressions gained earlier. In 1944 there were only 19.05 infectious disease beds per 10,000 population in the North-Eastern Region as compared with 28.42 infectious disease beds per 10,000 population in the Western Region of Scotland. [77]

This apparent pattern of regional variation in the provision of hospital facilities by local authorities

for the treatment of infectious diseases was not an isolated phenomenon. Other aspects of hospital provision in Scotland in the 1900 to 1947 period suggested similar conclusions.

Other Aspects of Hospital Provision 1900 - 1947:

The pattern of hospital facilities in Scotland was a very frustrating one to central government officials in Edinburgh. The Board of Health described the situation in 1928 as one in which hospitals in some areas had empty beds while in other areas, hospitals were badly overcrowded. [78] The Department of Health claimed that hospital organisation was inadequate and reflected the fact that they " have grown piece-meal out of different circumstances and needs " [79]. By 1938 the Department was complaining bitterly about the " parochialism " involved in the construction and extension of hospital facilities in Scotland. [80]

Although it was accepted that there was a general shortage of hospital beds in Scotland in 1909, the Royal Commission on the Poor Laws found that the shortages varied considerably from area to area. It argued that " outside the larger burghs and a few counties ... (there was) a great need for better provision of hospitals in rural districts " [81]. The Dewar Commission reported in 1912 that hospital provision in the Highlands was inadequate. [82]

By the late 1920's the situation was becoming even more obvious. The Board of Health felt that there was a shortage of poor law accomodation everywhere except for Glasgow and Dundee. [83] In some areas there was no room for pneumonia cases in either voluntary or poor law hospitals. [84] By 1928 the Board noted that despite an increase in the number of hospital beds in Edinburgh, Dundee, Aberdeen, Stirling, Falkirk and Perth, the shortage of beds still remained. [85]

By 1930 the Department of Health was deploring the discrimination against poor law patients who were faced with a lack of hospital beds, poor quality equipment and buildings. [86] In fact, the demand for hospital provision " in a number of areas " required the Department to make an " immediate decision to provide or extend hospital accomodation " [87]. Lerwick, in particular, was in great need of improved hospital facilities by 1932 [88], yet in 1935, the Department argued that " in Lerwick, the hospital is not only too small, but is also out-of-date " [89]. In 1934 the Cathcart Committee described the general hospital service in the Highlands and Islands as " still inadequate " [90]. There was, for example, no hospital accomodation of any kind on North Uist. [91]

The White Paper on the National Health Service recognised this regional imbalance in 1944 when it

pointed out that the cities seemed to have the best of the hospital facilities in terms of both local authority and voluntary hospitals. It noted that " the country's key hospitals, as well as the medical schools are all to be found in the four cities of Edinburgh, Glasgow, Aberdeen and Dundee " [92]. The 1946 Scottish Hospitals Survey provided more specific information regarding the situation in 1944. The North-Eastern Region contained 64.71 beds per 10,000 population as compared to 86.75 beds per 10,000 population in the Western Region. [93] When infectious disease beds were removed from the calculation, the figures changed to 45.64 beds per 10,000 population in the North-Eastern Regions and 58.33 beds per 10,000 population in the Western Region. [94]

Given the regional disparities which existed in local authority and voluntary hospital provision in Scotland during the period, it is hardly surprising that some areas should suffer from inadequate provision of specialist services. In the next section we examine some aspects of this branch of health care.

Specialist Services 1900 - 1947:

In some areas of Scotland and in some medical specialities, there was absolutely no provision available during much of this period. This was particularly true for the Highlands and Islands. Even as late as 1925, there was no surgical treatment available in Shetland,

Lewis and Harris. [95] By 1929 there were still no opthalmic specialists available to treat patients in either Inverness or Moray. [96]

The Department of Health understated the case in its First Annual Report when it indicated that in terms of surgical treatment some areas were very progressive while other areas tend to be rather hesitant to adopt new techniques and to equip facilities with new equipment. [97] The Report failed to stress that in some parts of Scotland there was no surgical treatment available. Even Islay, with a population of 6,000, was " devoid of any hospital provision where surgical operations could be conducted " [98].

The Department claimed that " in some of these districts it has not been practicable to establish local hospitals or to provide the specialist services available in more populous areas " [99]. The Cathcart Committee took a more critical stance. It claimed that nothing had been done of significance to improve the provision of dental and opthalmic services in the Highlands and Islands and criticised the existing situation soundly.[100] Although the Committee recognised that " geographic considerations may make it difficult to secure the help of an obstetrician of consultant rank in all cases ", much more could be done by developing links with the medical schools to extend and improve the quality and quantity of specialist services for residents of such areas. [101]

Despite some efforts by the Department of Health for Scotland, and even though the need was obvious, places like Sutherland still lacked a whole-time surgical service by 1939. [102] In some areas of medicine virtually all of Scotland, rather than just rural areas seemed to be falling behind. This was the case of orthopaedic medecine. Princess Margaret Rose Hospital in Edinburgh was one of the few examples of efforts to develop expertise and facilities for this branch of medecine in the late 1930's.[103]

During the war years, despite considerable development of specialist services, the tendency to favour one or two areas with staff and/or equipment continued. In 1942, for example, two specially equipped neuro-surgery units were established. One in Edinburgh served the east of Scotland; the other in Glasgow served the western areas. [104] The other three hospital regions which had been developed since the early 1930's received no special assistance in this field.

The Scottish Hospital Survey data provided additional information of this pattern of regional differentiation. The Western Region had 1.88 gynaecology beds per 10,000 population in 1944; whereas, the Northern Region contained only 0.64 such beds per 10,000 population. [105] In the case of orthopaedic services which were mentioned above, the evidence is even more startling. In 1944 there were 2.70 orthopaedic

beds per 10,000 population in the Western Region and no orthopaedic beds in the Northern Region. [106]

Conclusion:

The evidence presented above indicates that in three major aspects of the health services - general practitioner services, local authority health services and hospital and specialist services - there was variation between the regions in the provision of staff and facilities during the period. Although there were improvements in areas such as the School Health Service, even by 1947, forty years after the School Health Service was established in Scotland, the evidence suggests that the range of services and accessibility to services continued to vary between regions. In some aspects of the health services such as general practitioner services, school dental services and hospital and specialist services it appears from the above, that the difference between regions was quite large even at the end of the period.

It is also obvious that, to some extent at least, the government was aware of this problem by 1946. From such a perspective, the desire to remove regional inequality as a feature of the health care system in Scotland through the creation of the National Health Service seems to be a reasonable one.

The Period of the National Health Service:

The National Health Service (Scotland) Act of

1947 outlined the basic features of the new National Health Service in Scotland. It defined the responsibilities of the state in the provision of health care services. It outlined the structure of the new organisation and it guaranteed the awarding of annual grants to a number of agencies. Although there were a number of amendments during this period, the basic features of the Act remained virtually intact until the establishment of the re-organised National Health Service in Scotland in 1974. Three sections of the Act appeared to be particularly relevant to our interest in regional variation.

Part II of the Act dealt with hospital and specialist services. It established Regional Hospital Boards with general supervisory responsibilities for all the hospitals within their regions. The regions were to be determined so that " each area is such that the provision of the said services in the area can conveniently be associated with a university having a school of medecine " [107]. Medical Education Committees were to advise the Regional Hospital Boards on the administration of hospitals and specialist services insofar as teaching was concerned. The direct administrative responsibility for hospital management was placed in Boards of Management which would oversee the work of one or more hospitals. The schemes developed by the Regional Hospital Boards regarding

the creation of Boards of Management had to be submitted to the Secretary of State for Scotland for his approval before the Boards could be established officially and begin their work.

Part III of the Act established the new local health authorities and described their responsibilities. For large burghs, the town council assumed responsibility. In the case of combined counties it was the joint county council. In all other cases the county council was to be the local health authority. Each local health authority was required to submit plans regarding the provision of staff and facilities for mothers and young children's care, midwifery supervision and supply, health visitors, home nurses, vaccination and domestic help for the sick, pregnant, old mentally ill and school children to the Secretary of State for approval.

Part IV of the Act dealt with general medical services. It called for the creation of Executive Councils for general practitioners, dentists and pharmacists. These Councils were to be organised by county or combination of counties if such was appropriate. The Councils were responsible for the organisation of general medical services in their areas. If opthalmic services could be provided by the hospitals and meet the needs of the area, then

no Executive Council for supplementary opthalmic services was created. If the hospitals were unable to provide the necessary facilities and staff, then Executive Councils for supplementary opthalmic services were established.

Two of the organisational features mentionned in the Act deserve further attention. These are the Regional Hospital Boards and the Scottish Medical Practices Committee. Both structures had special relevance to the issue of regional disparities.

In Scotland five Regional Hospital Boards were established. The Northern Region included Caithness, Inverness,. Nairn, Ross and Cromarty, and Sutherland. Its hospital centre was Inverness. This was the only region which did not contain a medical school. The North-Eastern Region included Aberdeen, Banff, Kincardine, Moray, Orkney and Zetland. Aberdeen provided the specialist services and hospital centre for this region. The Eastern Region included Dundee, Angus, Kinross and Perthshire. Dundee was the hospital centre. The South-Eastern Region was the second largest in terms of population. Edinburgh provided the specialist services for Berwick, East Lothian, Fife, Midlothian, Peebles, Roxburgh, Selkirk and West Lothian. The largest region - the Western Region - with Glasgow at its centre, contained Argyll, Bute, Ayr, Clackmannan,

Dumfries, Dunbarton, Kirkcudbright, Lanark, Renfrew, Stirling and Wigtown.

The Scottish Medical Practices Committee was to approve applications of general practitioners who wished to establish practices in Executive Council areas. This Committee had the right to refuse applications for areas which were already adequately served by general practitioners.

In the following sections of the chapter an effort is made to present information regarding the success of the National Health Service in Scotland in eliminating the regional variation which existed in the distribution of facilities and staff. We examine three major aspects of health care in Scotland during the 1948 - 1976 period. Primary care is studied by analysing the distribution of general medical practitioners, general dental practitioners and pharmacists' outlets throughout the country. Local authority schemes are discussed in terms of the School Health Service and certain aspects of care for mothers and young children. Finally, the hospital and specialist services provide an indication of regional variation in the provision of staff and facilities by the Regional Hospital Boards.

General Medical Practitioners:

During the period a number of statutes and regulations which affected general practitioners were

issued. Some of the more important ones are outlined below.

The Medical Practitioners and Pharmacists Act of 1947 allowed for the registration of a number of doctors who would normally have been ineligible. They included medical diploma holders and persons serving in a medical capacity with British or Dominion forces abroad who applied before December 1948 and were able to satisfy the General Medical Council that their work had been competently performed. The Act also allowed the Council to register temporarily, doctors from abroad who wished to take up temporary employment in Britain.

The Medical Act of 1950 stipulated that practitioners fulfill an internship before they could be listed on the permanent register. It also required the General Medical Council to establish a disciplinary committee to deal with cases of alleged malpractice and unprofessional conduct and to determine penalties for professional offences committed by doctors.

By 1956 Executive Councils were empowered to appoint locum tenens to take over the patients of general practitioners who were unable to practice for some reason. NHS Amendment Regulations for Scotland, issued in 1957, made it clear that a general practitioner on an Executive Council list was directly responsible for

his own acts or omissions while acting as a deputy to another doctor on a medical list. These regulations also provided Executive Councils with the power to review authorisations to doctors to employ permanent assistants.

The National Health Service (General Medical and Pharmaceutical Services) (Scotland) regulations of 1966 allowed a doctor who used an appointment system to decline visiting immediately, a patient who called without an appointment. The regulations also allowed the doctor to accept fees from patients for minor services.

The National Health Service (Scotland) Act of 1972 went into effect in April 1974. It replaced the Executive Councils with Local Consultative Committees which were to provide the new Health Boards with professional advice. In addition, a national consultative committee was established to advise the Secretary of State on matters of mutual concern.

In its Annual Report of 1948, the Department of Health for Scotland commented on the uneven distribution of general practitioners throughout the country as a source of problems. The Department felt that the solution to such uneven distribution was likely to be a matter " of long term planning and gradual achievement " [108].

The Scottish Medical Practices Committee had special powers in this regard. In addition to its power to refuse permission to practice in " over-doctored "

areas, the Committee was also responsible for listing districts in which there was a shortage of general practitioners. Any district which was " listed " for three consecutive years was defined as a designated area and a special financial incentive was provided to encourage general practitioners to establish practices in these locations.

In addition to the designated area allowances, there were two other financial incentives provided to encourage general practitioners to establish practices in specified parts of the country. Inducement payments were made to doctors who practised in thinly populated or otherwise unattractive areas.[109] Initial practice allowances assisted " general practitioners who either set up a new single-handed practice in an area where an additional practice was required or fills a vacancy in a small single-handed practice where the maintenance of the practice was necessary for an efficient service "[110].

Information regarding the number of listed areas, inducement payments and initial practice allowances provide a basis from which to derive tentative conclusions regarding the geographic distribution of general practitioners for the period. This is supplemented by later information regarding variation in the number of people per general practitioner in various parts of the country.

In 1949 there were 49 listed districts in Scotland.[111] This helped to explain the reason why general practitioners were allowed to have lists of up to 4,000 patients even though the average list size in Scotland was 2,140.[112] Obviously, some sections of the country had few general practitioners and in consequence, large lists had to be accepted by the Department.

The government attempted to entice more general practitioners to these under-doctored areas. By 1950 it was providing inducement payments to 35 practitioners.[113] By the mid 1950's it appeared that the situation had not improved greatly. In 1955, 43 doctors were receiving inducement payments and 16 general practitioners were paid initial practice allowances.[114]

By 1958 it appeared that some progress was being made in removing the imbalance. Only 17 areas were listed as districts which needed additional general practitioners.[115] The number of initial practice allowances had dropped to 9.[116] On the other hand, the number of inducement payments had increased to 46.[117]

This pattern continued in 1960. There was a decline in the number of listed districts to 10.[118] The number of initial practice allowances had dropped to 3.[119] The number of inducement payments had risen slightly to 47.[120] In 1962 the number of listed districts, initial practice allowances and inducement payments were 6, 2 and 51, respectively.[121]

By 1966 the situation was beginning to alter slightly. Although the number of listed districts had declined to 2 [122], the number of initial practice allowances had doubled to 4. [123] In the same year the number of inducement payments had increased dramatically to 68. [124] At the end of the 1960's the evidence suggested that the variation in the distribution of general practitioners between regions was on the increase. In 1969, the number of listed areas had grown to 21. [125] The number of initial practice allowances had increased to 6 [126] and the number of inducement payments had reached a new peak of 73. [127] The Scottish Home and Health Department's Annual Report for the same year indicated even more directly the extent of the variation. It pointed out that list sizes ranged from 947 patients per practitioner in Sutherland to 2,488 patients per practitioner in Lanark. [128]

This gap between Scottish regions continued to increase in the 1970's. By 1972 the number of listed areas had increased to 25; the number of initial practice allowances had more than doubled to 13; there was an increase in inducement payments to 76. [129] In addition, the range between the smallest and largest list sizes had grown slightly. In 1972 the average list size per general practitioner in Orkney was 919. In Lanark the corresponding figure was 2,495. [130]

By 1974, the first year of the re-organised National Health Service in Scotland, this situation had not changed dramatically. There were still 25 listed areas and the Department reported that general practitioner maternity units in isolated areas were finding it difficult to maintain adequate staff. [131] As recently as 1976, there were still more listed districts than in 1960, and the variation in list sizes had not changed appreciably. [132]

In its Report for 1974, the Scottish Home and Health Department referred to the regional distribution of general practitioners since 1948. Despite a variety of financial incentives and the refusal powers of the Scottish Medical Practices Committee, " the distribution of general practitioners...had not changed significantly " [133]. As we shall see below, the same conclusion applied to the distribution of general dental practitioners.

General Dental Practitioners:

The National Health Service (Scotland) Act created a Dental Estimate Board to exercise some control over National Health Service expenditures on dental services. In the following period, additional legislation had considerable impact on the nature of the profession and the work of dentists. Some of the most important statutes and regulations have been described briefly, below.

In 1956 the Dentists Act was passed by Parliament. It followed the pattern of the other medical professions and established a General Dental Council for Britain. This Council had the power to admit to the professional register and to discipline members for improper or incompetent conduct. In effect, the Act established dentistry as a fully self-governing profession. The Ancillary Dental Workers' Regulations of 1957 created a category of dental hygienists who could be employed to assist dentists. In 1958 the Department of Health for Scotland issued amended regulations which " revised the list of prescribed drugs, the effect of which was to bring the list of drugs available to dental practitioners in Scotland into line, with one or two exceptions, with those available in England and Wales " [134]. The 1966 National Health Service (General Dental Services) (Scotland) Regulations enabled dentists renting accomodation at health centres to practise under the same terms of service as other dentists. The 1972 National Health Service (Scotland) Act disbanded the Executive Councils and replaced them with fifteen Local Consultative Committeees. It also created a national advisory committee which provided professional opinion to the Secretary of State for Scotland.

In its Annual Report for 1950, the Department of Health for Scotland pointed out the serious problems

of providing an adequate dental service in the Highlands and Islands. It found that in five Executive Council areas, the lack of dentists demonstrated a clear need to improve the situation.[135] In addition, there were six Executive Council areas in which a total of 11 general medical practitioners were authorised to provide emergency dental treatment because no dentist was available to provide such service.[136] Despite some improvements in the interim, by 1955 there remained 5 Executive Council areas in the Highlands and Islands in which general medical practitioners provided emergency dental treatment.[137] In 1960 the number of areas in which this situation existed had been reduced to three.[138] In its Report for 1960, the Department of Health for Scotland admitted that the cities and burghs were better served with dentists.[139] This was graphically illustrated by statistics which indicated that the number of people per dentist ranged from 3,175 to 6,925 in various parts of the country in the same year.[140]

In the 1960's and the 1970's this regional variation in the distribution of dentists continued to be a feature of the National Health Service in Scotland. In 1962 there were six general medical practitioners providing emergency dental treatment in two Executive Council areas in the Highlands and Islands.[141] By 1965 the situation appeared to have improved

considerably since only three general medical practitioners were authorised to provide dental treatment in the North. [142] Unfortunately, this improvement was only temporary. In 1967 the Scottish Home and Health Department concluded that the situation with regard to the provision of dental services in the Highlands and Islands was not completely satisfactory. [143] There was no dentist at all on the outer islands of Inverness-shire in 1968 and the variation in the number of people per dentist had increased too. [144] In one Executive Council area there were 3,054 people per dentist; in another, the ratio was 8,449 to 1. [145]

The 1970 Annual Report provided further evidence of this situation. Although Wick had finally procured the services of a dentist , there was no dentist available on Harris or North Uist. [146] The variation in population per dentist continued to grow. By 1970 one area contained 3,219 people per dentist while another area had a population of 9,587 per dentist. [147] Even as late as 1972, the gap was still widening. One area had 3,069 people per dentist, while another Executive Council area had 9,819 people per dentist. [148] In addition, there were still parts of the Highlands and Islands where general medical practitioners had to be authorised to provide emergency service because of the lack of qualified dentists in the area. [149]

The pattern suggested by the published Reports of the Health Department in Scotland is a mixed one. On the one hand, there has been a reduction in the number of areas in the Highlands and Islands where no qualified dentist is available. On the other hand, the gap between areas in terms of the number of people per dentist seems to be an increasing one. In the following section we may see a similar type of pattern insofar as the provision of pharmaceutical services is concerned.

Pharmaceutical Services:

As was the case with general medical practitioners and dentists, pharmacists found themselves subjected to new legislation and regulations which affected both their professional status and their working conditions. Some of the more important changes have been summarised below.

The Medical Practitioners and Pharmacists Act of 1947 allowed the General Pharmaceutical Council to register people with foreign diplomas and to register temporarily, qualified pharmacists who wished to work for a limited period in Great Britain. The National Health Service Amendment Act (1949) levied charges from patients for prescriptions received from general practitioners. The Pharmacy Act of 1953 abolished the separate registers of chemists and

druggists which had been established by the 1868 Pharmacy Act. It extended the powers of the Pharmaceutical Society with regard to the training of pharmacists and it allowed qualified medical practitioners to be registered as pharmaceutical chemists. The 1968 Medicines Act provided statutory safeguards for the purity and efficacy of drugs. It created a process of licensing the manufacturers of pharmaceutical products. The Medicines Commission was set up to provide independent advisors on licensing and drug purity and efficacy standards to the government.

In 1948 there were 1,750 pharmaceutical chemist's shops scattered unevenly throughout Scotland.[150] This meant that in some parts of the country, people did not have reasonable access to a pharmacist. The Department of Health for Scotland responded by authorising qualified medical practitioners to dispense drugs to their patients. These dispensing doctors practised in areas where access to a pharmaceutical chemist was very difficult and these areas tended to be in the Highlands and Islands and rural parts of Scotland.

In 1950 there were 220 dispensing doctors in Scotland.[151] By 1955 this number had dropped to 173 but other problems regarding the cost of prescriptions were causing consternation among officials of the

Department of Health for Scotland. [152] The 1955 Annual Report pointed out that there was great regional variation in prescribing practices and costs in Scotland. The average cost of a prescription in Banff, Moray and Nairn was nearly double that of the average prescription in Zetland. [153] As a result of these discrepancies the Department authorised Executive Councils to interview general practitioners who appeared to be over-prescribing, and to impose financial penalties upon such doctors. These measures did not appear to be effective. In 1958 the average prescription cost in Glasgow was almost twice that of a prescription issued in Sutherland. [154] In addition, the number of dispensing doctors had increased slightly to 176. [155]

By the mid 1960's the regional distribution of pharmacists' shops was still unbalanced. The 1965 Report of the Home and Health Department indicated the necessity of continuing to use dispensing doctors. [156] By 1967 dispensing doctors in Scotland were receiving £393,800 for providing pharmaceutical services in areas where pharmacists were unavailable. [157] Even in the 1970's the need to continue to pay dispensing doctors was evident to the Home and Health Department. [158]

Although the evidence presented in the Annual Reports is not sufficiently precise to enable us to determine the extent of the variation in the provision of pharmacists' shops in Scotland, it does indicate that,

to some extent, the variation which had existed in 1948 remains a feature of the National Health Service in Scotland into the 1970's. In the next section of the chapter the School Health Service is examined to see if the problem of regional variation which had been an important feature in the pre-NHS period continued to pose problems for school children and health care staff and officials in the post-NHS period.

School Health Service:

During the 1948 - 1976 period, the School Health Service was unaffected by major changes in legislation or regulations with the exception of the National Health Service (Scotland) Act of 1972 which transferred major responsibility for the School Health Service to the Secretary of State for Scotland. In general, the School Health Service experienced a broadening in the scope of the services offered during this period. Unfortunately, this development, as we shall see, did not occur in a uniform fashion and there remained considerable regional variation in the type of service provided from area to area.

In the following paragraphs, particular attention is paid to three aspects of the School Health Service in Scotland. These are dental care, vision testing and audiometric testing. In each of these elements of the Service, clear regional differences emerge.

In 1950 the Department of Health for Scotland pointed out that " some authorities, mainly those in the industrial areas, have managed to maintain their previous strength; in a few of the more remote counties at the end of the year, no school dental officers were available " [159]. The differences in the number of pupils per school dentist were startling. In Moray and Nairn the ratio was 34,000/1; in Shetland it was 3,000/1.[160] By 1955 the gaps had narrowed, but were still quite large. Edinburgh, for example, had 4,000 pupils per school dentist; whereas, Glasgow had 10,000 pupils per dentist. [161] In 1957 the gap between regions increased. Bute, for example, had 1,000 pupils per school dentist. Aberdeen, however, had 10,000 pupils per school dentist. [162] The Health and Welfare Services Report for 1963 indicated that there were variations in dental services particularly in the school dental service and that more school dentists were badly needed in several areas. [163] The 1972 Annual Report indicated that the shortage of school dentists in some areas was still a problem. [164]

Even though the Annual Reports of the Department of Health for Scotland had stressed the need for proper hearing tests in the School Health Service long before the creation of the NHS, by 1955 the Department found considerable variation in both the types of tests being given and the quality of the

equipment which was being used. Only some areas were using " pure tone audiometers " [165]. In fact, the Home and Health Department reported in 1960 that not all authorities had yet established audiometry services.[166] By 1962 the Home and Health Department described the situation more clearly. " All of the large authorities and most of the small ones have now made arrangements for routine audiometry to be carried out. " [167] In 1964 it was apparent that almost all areas had some form of audiometry service available. [168] Unfortunately, the variations in the quality and range of audiometric testing continued to plague the School Health Service in Scotland well into the 1970's. [169]

The third aspect of the School Health Service which posed difficulties was vision testing, particularly of younger pupils entering Primary 1. Although the Department of Health reported in 1959 that routine testing of vision at five years of age took place in many areas [170], the full extent of the variation was better reflected in later Reports. The Report for 1960 emphasised that not all areas were providing vision tests to five year old children. [171] By 1963 the extent of the variation became more starkly recognised. With regard to vision tests the Home and Health Department argued that " shortage of staff had prevented some school health services from giving complete care to

five year olds, but it is accepted that there is a need for a test " [172]. By 1967 the Department could find only five school health authorities which used Keystone vision screens as part of the medical examination procedure. [173]

During the 1970's it was apparent that all was not well within the School Health Service in Scotland. The 1972 Report indicated that the larger authorities had well-established and full-developed services and that the smaller authorities were having great difficulty in fulfilling their responsibilities. [174] The same type of pattern became obvious when we examined the provision made by local authorities for the care of mothers and young children.

Local Authority Health Services:

The local authorities were deprived of control over local authority hospitals by the National Health Service (Scotland) Act of 1947. Despite this loss, the local authorities still had an important role to play. This was particularly true with regard to the care of mothers and young children. During this period, this serious responsibility was altered by several changes in legislation and regulations.

The Health Visitors and Social Work Training Act of 1962 established a Health Visitors Training Council and a Social Work Training Council with Scottish

advisory committees to recommend and to supervise the training of these two professions.

This resulted in both an increase in the education standard of student nurses and a change in the syllabus for health visitors. In 1964 students who wished to train as nurses were required to have two O level passes, one of which had to be English. The 1964 syllabus for the training of health visitors placed greater emphasis upon fieldwork experience. These changes were to have serious implications for many local authorities as we shall see.

The Health Services and Public Health Act of 1968 encouraged midwives, health visitors and home nurses to attend to patients in women's centres, clinics and surgeries. It allowed for greater flexibility in the work of these practitioners and required greater co-operation between these groups and local health authorities and general practitioners.

The 1968 Social Work Act was one of the most important pieces of legislation as far as the local authorities were concerned. The Act transferred most of the local health authority responsibility in the field of mental health to the newly established Social Work Departments of local authorities.

The 1972 National Health Service (Scotland) Act abolished the old local health authority system.

The renamed community health services became the responsibility of the fifteen Health Boards in Scotland.

The 1948 Annual Report of the Department of Health for Scotland indicated that the main difficulty insofar as the local authority health services were concerned was the lack of available, qualified staff. The Department noted that there were insufficient numbers of health visitors, assistant medical officers and dental officers to meet existing needs. [175] Many of the difficulties which beset the service in the later years resulted from similar shortages of staff.

One of the initial problems regarding maternity care was the provision of analgesia. By the end of 1950, not all of the " local authorities had made arrangements for the provision of analgesia in their domiciliary midwifery services " [176]. This anomoly was rectified by the end of 1951 [177], but other problems emerged.

In part, this resulted from a shortage of maternity beds in hospitals. As a result, by 1955 in many local authority areas, maternity services were " dovetailed with those of the hospital and general practitioner services " [178]. This was not required in some large urban centres where the hospitals provided complete obstetric ante-natal care.[179] As late as 1958, the Department reported that some areas did not

provide any kind of clinic service for the care of mothers and young children. [180]

This problem, which most seriously affected ante-natal care corresponded with another problem which affected post-natal and infant health care. In 1959, the Department of Health for Scotland reported that health visitors were unable to visit the homes of newly born infants in some parts of the country. [181] This was, in part, a result of the uneven distribution of health visitors. Although the national average of health visitors to population was 1/4,187, in at least one area of Scotland in 1959, the ratio was 1/5,500. [182]

By 1964 the Home and Health Department had found that some local authorities had made great strides in the provision of health clinics. [183] To some extent, this might have been the result of a larger burden on others, which resulted from regional differences in access to maternity beds. The 1965 Annual Report of the Home and Health Department noted that there was " a substantial variation in the proportion of home confinements in the different areas of Scotland " [184]. By 1968 the Department was able to point out that although the national average of home confinements was 8 percent of total births, there were three areas in which home confinements exceeded 20 percent. [185] The Report went on to state that " the areas where home confinements ranged between

0 and 2 percent were those well provided with general practitioner maternity units " [186]. By the 1970's the picture had changed only slightly. In 1971 95.3 percent of the births in Scotland took place in hospitals.[187] There were four areas, however, in which less than 90 percent of the births took place in hospital. [188]

By 1969 the effects of the changes in the training of health visitors were becoming more obvious. Rural authorities, in particular, were having serious problems in recruiting health visitors. [189] This shortage continued to plague the Scottish Health Service into the 1970's. [190]

The regional variations in local authority health services did not confine themselves merely to maternity services. They also affected other aspects of health care services for children. The Home and Health Department in 1968 summarised the situation succinctly. It found that some local authorities were content to follow traditional ideas, while other areas were " awake to the need for change " [191]. This was an obvious conclusion in the light of discoveries regarding local authority involvement in vaccination and the provision of child guidance clinics.

In 1956, of 55 local health authorities in Scotland, two were not involved in the provision of

BCG vaccine to pre-school children. [192] By 1962, the Department noted that it was only in a few areas that vaccination of babies was offered as a routine practice. [193] This variation in vaccination practices by local health authorities continued well into the 1970's. [194]

Child guidance services were provided by local health authorities to improve the treatment of and care for maladjusted children. By 1957 it appeared that only 80 percent of the children in Scotland had access to such services within their own local authorities. [195] Even where the services were offered, they varied greatly in terms of the types and range of treatment available. [196] By 1962 the Department reported that the number of areas providing this service had increased from fifteen to twenty-six. [197] Unfortunately, the Department has not provided any more recent information regarding this aspect of health care to allow us to determine if this variation in service continued into the following decade.

The evidence which is available, however, does suggest that, at least as far as the provision of maternity and pre-school children's care are concerned, there has been and continues to be, regional variation in the type, extent and availability of service in Scotland. To some extent, the evidence suggests that

one of the reasons for such variation is a variation in hospital facilities in Scotland. It is to this major aspect of health care that we turn next.

Hospital and Specialist Services:

The National Health Service (Scotland) Act of 1947 seriously altered the organisation of hospital and specialist services in Scotland. All voluntary and local authority hospitals were transferred to the jurisdiction of the Secretary of State. One of his responsibilities was to ensure that there was sufficient hospital accomodation, staff and specialist services available to meet the needs of the population for hospital treatment. The Hospital Endowments Commission, the Regional Hospital Boards, Medical Education Committees and Boards of Management came into being to assist the Secretary of State to carry out his responsibilities and to advise him on policy matters.

During the 1948 - 1976 period a great deal of regulation and legislation altered the organisation of hospital and specialist services. The increased demand for hospital and specialist services also had an impact upon the manner in which these services were provided.

The Hospital Endowments (Scotland) Act of 1953 established the Scottish Hospitals Endowments Research Trust. Although most of the research was

to be concerned with the treatment of disease, some of the research funds were used to examine hospital efficiency.

The legal responsibilities of the hospital authorities were clarified by two important court cases. In Hayward vs Board of Management for the Royal Infirmary Edinburgh and Others, and in Macdonald and Another vs the Board of Management for Glasgow Western Hospital and Another, a significant legal point was made. Prior to these two cases, the hospital authorities had not been deemed to be responsible for the treatment of patients. They were responsible for providing accomodation and competent staff. The staff were responsible for providing treatment. The decision of the Court of Session was that the hospital authorities were indeed responsible for the treatment of patients.

The government responded to this situation in 1955 by establishing the Central Legal Office. This Office was to provide legal services for Regional Hospital Boards and Boards of Management. Its costs were met by exchequer funds.

In its efforts to improve hospital efficiency, the Department of Health called upon the Scottish Branch of the O and M Division of HM Treasury to provide expertise. These officials were given assignments at the request of hospital authorities. The first such

study took place in Aberdeen in 1956.

In 1958 a new structure of medical administration was started. It was based on the amalgamation of the medical administrative staff on Regional Hospital Boards with the non-clinical Medical Superintendents of hospitals. The Boards were asked to see that these medically qualified administrative officers were available in both advisory and executive capacities. The Department suggested that the role of these new staff should be broadened to ensure that they could concentrate on problems within their own fields of expertise.

In 1965 the Scottish Hospital Centre was opened. It had a number of responsibilities. The Centre was to promote research into fundamental design and operation of hospitals and into the design of hospital equipment. It maintained an equipment exhibition and provided a centralised library service which included the preparation and publication of reports and summaries on the research work conducted under its auspices.

The Health Services and Public Health Act of 1968 reduced the number of hospitals from 63 to 49 at which pay beds were available. The number of pay beds was reduced from 571 to 343. The Act did authorise the treatment of private patients on an outpatient basis in all hospitals in Scotland.

The Chronically Sick and Disabled Persons Act (1970) created serious problems of accomodation for the hospitals. It required that young patients, whether chronically sick or mentally ill, should not be mixed with adult patients. The Regional Hospital Boards were required to do what they could to follow this direction and to report any non-compliance to the Secretary of State.

In 1972 the Scottish Hospital Advisory Centre came into being. Its job was to advise on the management of facilities and the requirements for the mentally ill, the mentally deficient, geriatric, the young and the old chronically sick patients. It provided an information centre and was to have an important role to play in the future planning of health care and facilities for the groups of patients indicated above.

The National Health Service (Scotland) Act of 1972 brought to an end the Regional Hospital Boards, the Boards of Management, and the Medical Education Committees. It replaced them with the fifteen Health Boards and four University Liaison Committees which were to provide links between the Health Board and the four universities with medical schools. It also attempted to provide a basis with which general practitioners could more easily be integrated with hospital and specialist services.

It was, in many ways, the hospital and specialist services which faced the greatest obstacles after the creation of the NHS. The 1953 Report of the Department of Health for Scotland outlined some of the major difficulties. " The hospital service, more than any other branch of the health services was beset by problems of building and accomodation ." [198] The Department of Health's 1949 Report indicated that even a reasonably adequate specialist service had yet to be established in some parts of the country. [199] Regional variation in the provision of specialist services continued to be a problem throughout the period.

Specialist Services:

As early as 1949 problems resulting from the creation of the National Health Service indicated shortages in the availability of medical specialists. As a result of negotiations regarding the grading and remuneration of specialists, it became apparent that there were vacancies in some areas and in some specialities. [200] Once again, it was the rural and remote areas, particularly in the Highlands and Islands which faced the most severe shortages

In 1950 Orkney and Shetland lacked resident consultant physicians and surgeons. [201] The Department of Health responded by establishing a series of regular visits to these areas by consultants from Aberdeen. [202]

By 1955 it was apparent that only in the large urban areas could complete obstetric ante-natal care be obtained in the hospitals. [203] Only one facility existed in Scotland, in Edinburgh, in 1957 to provide megatherapy for cancer patients. [204] In 1959 the imbalance with regard to the provision of specialists in geriatric medecine was obvious. The Department of Health reported that even though the Northern Region had the highest percentage of its population over the age of 65 in Scotland, there was no geriatric specialist practising in the region. [205] In its 1961 Report the Department of Health for Scotland argued that in terms of geriatric care there seemed to be considerable regional variation in both the number of beds and consultant appointments. [206]

The Department appointed a committee to examine this problem. The Wright Report was published in 1964. It found that there were " at least in certain specialities, differences between the staffing standards as between one region and another " [207]. In particular, the Report noted the problems of the Northern Region where in some fields of medicine, only one consultant might be available. [208] It found a need to appoint more consultants in general medicine, obstetrics and gynaecology. [209] At the same time the

committee noted that the Eastern Region had the highest number of specialist staff in relation to population [210] and the Western Region had the lowest number of specialist staff to population in Scotland. [211]

Unfortunately, this trend was not reversed quickly. By 1966 kidney transplant facilities were available only at the Western General Infirmary in Glasgow. [212] Renal dialysis machines were available only in Dundee, Edinburgh and Glasgow. [213] In 1967 haemodialysis was available in only five hospital units in Aberdeen, Dundee, Edinburgh and Glasgow. [214] Once again, the Northern Region seemed to be completely excluded.

This argument was reinforced by the Birsay Report in 1967. The Report assessed medical services in the Highlands and Islands. It concluded that the provision of obstetric and gynaecology specialists had been too infrequent, [215] that geriatric medecine was badly understaffed [216] and that resident consultant physicians were needed in Orkney and Shetland. [217]

This point was re-emphasised once again, in the 1968 Report of the Scottish Home and Health Department. It noted that the Northern Region had no specific geriatric units and that the provision of specialist geriatric care was in short supply in the South- East of Scotland and in parts of the Western Region. [218]

The pattern of centralised specialist services was reflected in the 1969 evidence regarding the treatment of kidney disease. Two centres, Glasgow and Edinburgh, had transplant facilities and staff. [219] The number of units providing dialysis had increased to six, but the number of areas served remained the same as had been the case previously. [220]

In 1971 a more complete picture of the variation in the provision of specialist services was revealed. The Annual Report indicated the number of specialist beds by region for that year. From a long list of types of beds, the Northern Region appeared to have no specialist units for neurosurgery, urology, thoracic surgery, plastic surgery, surgical paediatrics, cardiology, metabolic diseases, neurology, haematology, physical medicine, young chronic sick, child psychology and radiotherapy. [221] By comparison, the Western Region was lacking specialist facilities in only haematology and physical medicine. [222] Perhaps as a consolation, 1971 was the year in which the first resident consultant in geriatric medicine was appointed in the Northern Region. [223]

Despite this evidence of imbalance, the pattern did not change dramatically in the 1970's. By 1972 only Glasgow and Edinburgh had kidney transplant facilities. [224] Haemodialysis was still only available

in six hospital units in Dundee, Aberdeen, Glasgow and Edinburgh.[225] In 1975 the Scottish Health Statistics revealed the discrepancies in terms of the new Health Board Regions. The Western Isles were served by 5 consultants who specialised in four different branches of medicine.[226] Lothian Region, on the other hand, had 347 specialists of consultant rank working in 39 different specialities.[227]

This evidence suggests that the variation in the provision of specialist services which had existed before the creation of the National Health Service in Scotland continued to be, to a considerable extent, an important feature of the NHS in Scotland into the 1970's. It also indicates that Inverness never really became the specialist centre for the Northern Region in the same way as Aberdeen, Dundee, Edinburgh and Glasgow did for the other regions . That this pattern should be reflected in the regional variation of hospital facilities should not be a complete surprise.

Hospital Services:

The shortage of nurses in Scotland at the end of the war had a serious effect upon the availability of beds in the early years of the National Health Service. In 1948 the Department of Health for Scotland estimated that about 6,900 beds were unoccupied because of the lack of nursing staff.[228] The Department also

reported an acute shortage of hospital accomodation for elderly, sick people. [229]

In the first year of operation the regional disparities in the number of beds were obvious. In 1948 the Northern Region had approximately 10.5 hospital beds per 1,000 population as compared to 11.8, 16.3, 11.1 and 12.4 beds per 1,000 population in the North-Eastern, Eastern, South-Eastern and Western Regions, respectively. [230]

The Committee of Enquiry into the Costs of the National Health Service reported in 1956. It provided statistical information regarding the regional distribution of hsopital beds in Scotland in 1953. It figures demonstrated a similar gap between regions, but the rankings had changed somewhat. The South-East Region had only 11.1 beds per 1,000 population as compared with the North-Eastern Region's 11.8, the Northern Region's 12.6, the Western Region's 12.7 and the Eastern Region's 17.8. [231]

In the interim, the Department of Health for Scotland discovered that there was not a sufficiently large stock of tuberculosis beds to meet the demand. As a result, 180 beds in Switzerland were contracted for to help deal with the situation. [232] By 1955 the need for this special arrangement had declined to the extent that the Swiss beds were no longer needed. In

fact by 1956 the Department was arguing that, outside Glasgow, there were too many tuberculosis beds. [233] On the face of it, this seemed to be a strange claim indeed. In 1955 the Western Region had approximately 1.3 tuberculosis beds per 1,000 population as compared with the South-Eastern Region which had less than 1.1 tuberculosis beds per 1,000 population. [234] Clearly, the incidence of the disease must have been higher in the Western Region than in the South-Eastern Region.

By 1957 the Department of Health for Scotland became aware of the regional variation in the number of beds for the chronic sick. It found that the number of beds for chronic patients varied from 1.26/1,000 to 0.9/1,000. [235] " Within the hospital region some areas had as many as 1.8 beds/1,000 while 0.6/1,000 was the lowest." [236]

This pattern of regional variation was to continue throughout the period. By 1961 the variation in the number of total beds per 1, 000 population indicated the construction of new hospital facilities. The Northern and South-Eastern Regions each had 12.6 beds/1,000. The North-Eastern Region, the Western Region and the Eastern Region had 13.6, 13.7 and 17.6 beds/1,000, respectively. [237] In 1971 the figures once again reflected the increased building. The Northern Region had 12.6 beds/1,000 population; the South-Eastern Region had 12.9 beds/1,000; the Western Region had 14.1 beds/1,000;

the North-Eastern Region had 14.4 beds/1,000; the Eastern Region had 16.1 beds/1,000. [238]

Clearly the data presented in the Annual Reports provide a picture of regional imbalance in the provision of hospital facilities. This is reflected in the availability, not only of the total number of beds, but also of the number of specialist facilities for tuberculosis and chronic care.

Conclusion:

At the beginning of this chapter three basic concerns were indicated. The first of these was to see if there had been considerable regional variation in the provision of health services in Scotland prior to the creation of the National Health Service. The second concern was to gain some appreciation of the extent of regional variation in the provision of health services in Scotland from 1948-1976. A third related issue was that of whether regional imbalance in health care provision had been a persistent feature of Scottish health services in the twentieth century.

Although the evidence presented in this chapter is not based upon a systematic detailed analysis of all of the available primary and secondary sources, there is enough information to allow us to respond to the three questions posed in the introduction.

In the period prior to the creation of the National

Health Service, there was considerable variation in the provision of health care staff and facilities between regions in Scotland. On this basis, the concerns expressed in Parliament by the Secretary of State for Scotland regarding the need to achieve some form of regional equality were realistic ones.

The evidence cited in the chapter indicates that the National Health Service had not been able to make a major dent in the degree of regional variation which had existed prior to 1948. On this basis, it is clear that regional variation has been a persistent feature of the organisation and delivery of health care services in Scotland. In addition, this feature has not been confined to a narrow range of services. It has characterised general medical, dental and pharmaceutical services, the School Health Service, local authority health services, and the hospital and specialist services in Scotland from the beginning of the century.

Perhaps even more important than these specific conclusions are some corollaries of them. Clearly, the problem of regional variation in the Scottish Health Service is one worthy of extensive examination. A systematic study is required to both describe more accurately the nature of the variation in the National Health Service in Scotland and to explain more thoroughly the reasons why such variations should exist. It is to this latter concern that we turn in the next chapter.

Chapter III

Explaining Public Policy - A Model to Guide the Analysis of Policy Variation in the Scottish Health Service

The Nature of Models:

Models have been used by social scientists for a number of purposes. Deutsch has argued that a model must facilitate explanation of the phenomenon under investigation. [1] In order to do this successfully, the model must be isomorphic with reality. In the same book, Deutsch claimed that the successful model is one which enhances the predictive capacity of the researchers. [2] Dye pointed out that " the utility of a model lies in its ability to simplify political life so that we can think about it more clearly and understand the relationships which we find in the real world " [3]. Lewis and Davies have addressed themselves directly to the question of policy models. They concluded that any useful policy model must accurately describe the policy process and indicate ways of improving the policy-making system. [4] A model, then, should contain explanatory, predictive and prescriptive elements and accurately represent the phenomenon under investigation.

This concept of a model does produce a serious problem because of the conclusion that a model must contain prescriptive as well as empirical referents. It is necessary to deal with the distinction between the two elements and their application to policy analysis.

One group of social scientists engaged in policy research argues that there are two fundamentally different approaches to policy analysis. [5] The type of research which they undertake is concerned essentially with explanation, and for that reason, they see no need to include prescriptive elements in the models which they develop to assist them in their work. " By choosing to employ an empirical model, we are committing ourselves to the task of explanation rather than recommendation. " [6]

Lasswell and his colleagues advocate a more normative approach to the development of models for use in the policy sciences. [7] They believe that prescriptive models should be developed to describe the relationship between specific public policies and the various definitions of the " good " life. Their fundamental concern would be to determine the best means of achieving specified ends.

Because the basic concern of this project is empirical, it seems to be appropriate to use a model which has as its primary focus, an emphasis on aiding

our understanding and explaining the nature of the regional variations within the Scottish Health Service. For this reason, no effort has been made to include prescriptive elements in the conceptual model which is to be developed.

There are a number of analytical approaches to the study of public policy in the literature of political science, sociology, and policy analysis which are related to our work. One or more of them may provide a basis for further development and use in this project.

The Institutional Approach:

The institutional approach constitutes the core of traditional political science. It assumes that there is a relationship between the structure of government and public policy. On the surface, this seems to be a logical conclusion since governments are responsible for providing the legitimacy required by successful policies; because only governments can ensure a universal application of policy to a society; and because governments claim to possess a monopoly of coercive power and can compel obedience for that reason.

Initially, the institutional studies attempted merely to describe a specific governmental institution. They were biased in their emphasis on legal (formal)

powers and constitutional development. Normally, the links between public policy and the structure under investigation were ignored. Heclo pointed out that " among the more traditional institutionalists, policy had always been given a decidedly secondary place and was assumed as almost a self-evident byproduct of the distribution and content of powers in formal governmental structures " [9].

Rossiter's The American Presidency and Jenning's Cabinet Government are excellent examples of such studies. Rossiter argues that the modern President of the United States has ten different roles to play. " Some of these are clearly mandated by the formal, constitutionally specified nature of the post. Others derive from the evolution of the office...." [10] Jennings traces the development of cabinet government in Britain in law, custom and convention and the " democratic principle ". [11]

In the latter half of the 1950's and during the 1960's government institutions were scrutinised by researchers using a wider variety of tools. Wahlke [12] and many other scholars used roll -call analysis to explain the operation of the U. S. Congress. Kornberg used extensive questionnaires and interviewing to carry out his socialisation studies of Canadian Members of Parliament. [13] Robinson's research led him to

conclude that " congressional politics is committee politics " [14]. MacKay describes clearly the functioning of the upper house in the Canadian legislative process. [15] Wildavsky's comments on the applicability of PPBS for policy analysis in the U. S. result from comparative studies of presidential- congressional and parliamentary forms of government. [16] Duverger and others demonstrate the relationship between electoral systems and partisan political choice. [17] With a few exceptions [18], most of these types of studies suffer from the same limitation as the more traditional studies; they tend to ignore the relationship between public policy and the phenomenon under investigation. Heclo argues that " modern political science, particularly under the influence of the behavioural school, has usually given little attention to policy " [19].

The major exception to this criticism has been the case studies of specific pieces of legislation or administrative rule-making which have been undertaken. Bailey's classic work, Congress Makes a Law, is an excellent example of the customary approach used. [20]

Bailey examines the passage of the U. S. Employment Act of 1946, from its initial drafting to its signature by President Truman in February, 1946. He points out that historical events such as the Great Depression and World War II had led to the

development of new social attitudes which made such a piece of legislation possible. He examines a variety of similar proposals which had failed in the past, but he focusses most of his attention on Congress. Bailey describes the actions of the variety of interest groups which attempted to pressure politicians regarding provisions of the bill. He describes, with regret, the compromises which had to be made in order to obtain the majorities necessary for Congressional approval.

In his final chapter, Bailey raises some of the questions which many of his colleagues have attempted to answer. He asks how the U. S. political system can produce better policies. Richardson's study of the 1956 Restrictive Trade Practices Act concludes that more responsible political leadership by British parties is needed in Britain. [21] Fox has called for the establishment of proportional representation in Canada. The Labour Party in Britain recently adopted a resolution calling for the abolition of the House of Lords. The American Political Science Association has argued that a party system modelled after the British pattern would improve the American Congressional process.

In a few cases, the case studies fail to draw any conclusions at all. Chapman's intensive examination of the Bank Rate Decision of 1957 studies, in considerable

detail, the actions of participants in this particular decision-making process. Chapman fails to draw any conclusions other than " the case itself should be a contribution to knowledge " [22].

Dye suggests that some of the more zealous proponents of this type of research have made exaggerated claims about its significance. He says that:

> We must be cautious in our assessment of the impact of structure on policy. We may learn that both structure and policy are largely determined by environmental forces, and that tinkering with institutional arrangements will have little independent impact on public policy if underlying environmental forces - social, economic and political - remain constant. [23]

It appears that the institutional approaches have very little to offer in our effort to understand why public policy varies from region to region in Scotland.

Sociological Approaches:

The sociological approaches to the study of public policy have taken two basic forms. One involves the application of group theory. The second is elite theory.

Group theorists argue that interaction among groups is a central facet of politics. [24] A group acts as a link between the individual and the

government and enhances his influence upon the government.

A government reacts to this pressure in a variety of ways. It may attempt to establish the rules of the game. In the U. S. for example, major organised interest groups must register officially so that their activities may be monitored more easily. Political leaders attempt to arrange the compromise policies which are acceptable to major interest groups. This, of course, is the classic brokerage role envisioned by Schumpeter. Once a satisfactory compromise is arranged, governments are frequently required to produce the detailed policies accepted by the competing groups. Simeon's study of federal-provincial negotiations regarding the Canada Pension Plan and the legislation which followed, details one example of this process admirably. Occasionally, governments may feel obliged to enforce the accepted compromise. The action of the Labour government in 1978 in depriving companies which had negotiated excessive wage settlements of their export credits is a case in point.

In group theory, public policy is the equilibrium reached in the group struggle. The equilibrium is determined by the relative strength of the competing groups. Any significant change in the influence of one group will produce a change in policy and will

establish a new equilibrium. The influence of a group is a function of its size, wealth, organisational structure, leadership, access to decision-makers and its internal cohesion.

Systems maintenance is preserved by a variety of techniques. Within most societies there exists a large latent (categoric) group which accepts the system. This group can be made to manifest itself if a threat becomes apparent. Senator Irvine's behaviour during Watergate can be viewed as an example of an attempt to obtain the support of the " silent majority " for the constitutional nicities of the U. S. political system.

Because most members of society belong to more than one group, reinforcing cleavage models are rarely applicable. Instead, cross-cutting cleavages tend to move groups in the direction of moderation. Few, if any, groups of influence move too far from the prevailing views of society. Finally, the group competition means that there are always countervailing forces to each influential group which prevent it from becoming a majority force. This Galbraithian notion of countervailing forces is clearly one of Prime Minister Trudeau's conception of modern government. [25]

The applicability of such " pluralist " approaches

to the study of policy-making in Britain is a source of considerable disagreement. In his excellent book, Policy-Making in British Government, Smith argues that " ...British politics are not characterised by equally powerful group interests as is required by the pluralist model " [26]. Hewitt's research, on the other hand, suggests that " the study of policy issues suggests a rather pluralist interpretation of the British political system " [27]. Kantor takes a position midway between the two. He argues that on functional issues which do not involve clear class interests, the policy-making process in British local authorities is pluralist. [28]

" In the past the NHS has been a game preserve for political scientists interested in analysing the role of pressure groups. " [29] This approach has emphasised the conflicts between the various interested parties on a variety of NHS-related policy issues. Eckstein sees policy-making in the NHS as a result of the power of a number of organised interests. [30] Marmor and Thomas suggest that the power of the doctors in influencing policy results from their control of expertise. [31]

Klein argues persuasively that the usefulness of the pluralist model for understanding the policy-making process is a limited one. He points out that it ignores issues involving co-operation and commonality

of interests between groups. [32] In one article he demonstrates that three policy models which had been developed by Allison apply to different types of policy issues in the NHS. [33] In a later paper he shows " the irrelevance of much of the pressure group or pluralistic bargaining theory in the context of an organisation like the NHS ". [34] At best, it seems that the pluralist model has only a little to offer in assisting us to develop an appropriate policy model for explain regional variation in the Scottish Health Service.

Elite theorists argued that public policy is the product of the preferences and values of the governing elite. Even in democracies policies flow downwards from the elites to the masses. Dye summarises elite theory as:

> 1. Society is divided into the few who have power and the many who do not. Only a small number of persons allocate values for a society; the masses do not decide public policy.
> 2. The few who govern are not typical of the masses who are governed. Elites are drawn disproportionately from the upper socio-economic strate of society.
> 3. The movement of non-elites to elite positions must be slow and continuous to maintain stability and avoid revolution. Only non-elites who have accepted the basic elite consensus can be admitted to governing circles.
> 4. Elites share consensus in behalf of the basic values of the social system. In America, the bases of elite consensus are the sanctity of private property, limited government and individual liberty.

> 5. Public policy does not reflect demands of the masses, but rather the prevailing values of the elite. Changes in public policy will be incremental rather than revolutionary.
> 6. Active elites are subject to relatively little direct influence from apathetic masses. Elites influence masses more than masses influence elites. [35]

There may be a variety of elites competing for power within society (Mosca, Pareto) or the different elites may be so intermingled as to be practically indistinguishable from each other (Porter, C. Wright Mills).

Hunter's study of Atlanta led him to conclude that power was based in the hands of a few men. [36] Their position was based upon their incumbency at the apex of the community's economic life. Dahl's study of New Haven, on the other hand, indicated that there was very little overlap of key participants in different issue areas. [37]

The appropriateness of the elitist approach to the study of public policy in Britain is debatable. Smith argues that " the links between members of the political, administrative, military, judicial, industrial and religious elites encompass social class, educational experience and even kinship ". [38] Ralling's study of Paisley indicates that the most influential members of council ranked highest in terms of socio-economic status. [39] Hewitt, on the other hand, concludes " that elitist theories find little support from a study of

our twenty national policy issues ". [40] Kantor's analysis suggests that the elitist approach applies only to certain types of policy issues in which clear class differences are obvious. [41]

In terms of policy-making in the NHS, the elitist hypothesis seems to be particularly attractive. Even pluralists like Eckstein [42] and Thomas and Marmor [43] recognise and demonstrate the tremendous influence of the medical profession. Such an approach seems to adequately explain why the NHS appears to be " a consultant dominated service ". [44]

> Elitist theory would seek the explanation for medical domination in the fact that doctors are part of Britain's political elite. There is no problem is finding evidence to support this view. For instance, the similarity in the social and educational background of administrative class civil servants and doctors is striking. Over seventy-three percent of doctors and sixty-seven percent of administrative class civil servants were born into the middle or upper classes; only forty-three percent of doctors and forty-two percent of senior civil servants were educated in State Schools. What is more, the proportion of doctors who went to public schools is higher in precisely those specialities which carry the greatest professional rewards and power- for example, surgeons and physicians - and which are also strongly represented on various advisory and policy-making bodies. [45]

Klein continues his argument by demonstrating two weaknesses of the elitist approach in explaining policy-making in the NHS. [46] First, he provides an alternative explanation in terms of the constraints

imposed by the policy environment and particularly, public opinion, upon the viable options which can realistically be considered by policy-makers. His second argument is even more telling. If, as the elitist model suggests, there is such a shared background and outlook on the part of the medical profession and the senior civil servants, then why is there such frequent confrontation between the two ? In other words, the elitist approach fails to account successfully for the intensity and frequency of conflict which exists between these two influential groups within the National Health Service.

The major insight which the sociological models provide for the examination of public policy is their recognition that forces outside the structures of government do have an effect upon the public policies enacted by government. This is one of the many features of the work of Easton who attempts to develop an empirical model of the political system.

Easton's Political System:

For Easton, the central concept of politics is the " authoritative allocation of values for a society ". [47] Hofferbert argues that this definition is equally appropriate in describing public policy. [48] Easton's model, then, would seem to have direct relevance for the study of public policy.

Easton developed his model in A Framework for Political Analysis. [49] In another publication he presented a simplified diagrammatic representation of his conclusions. [50]

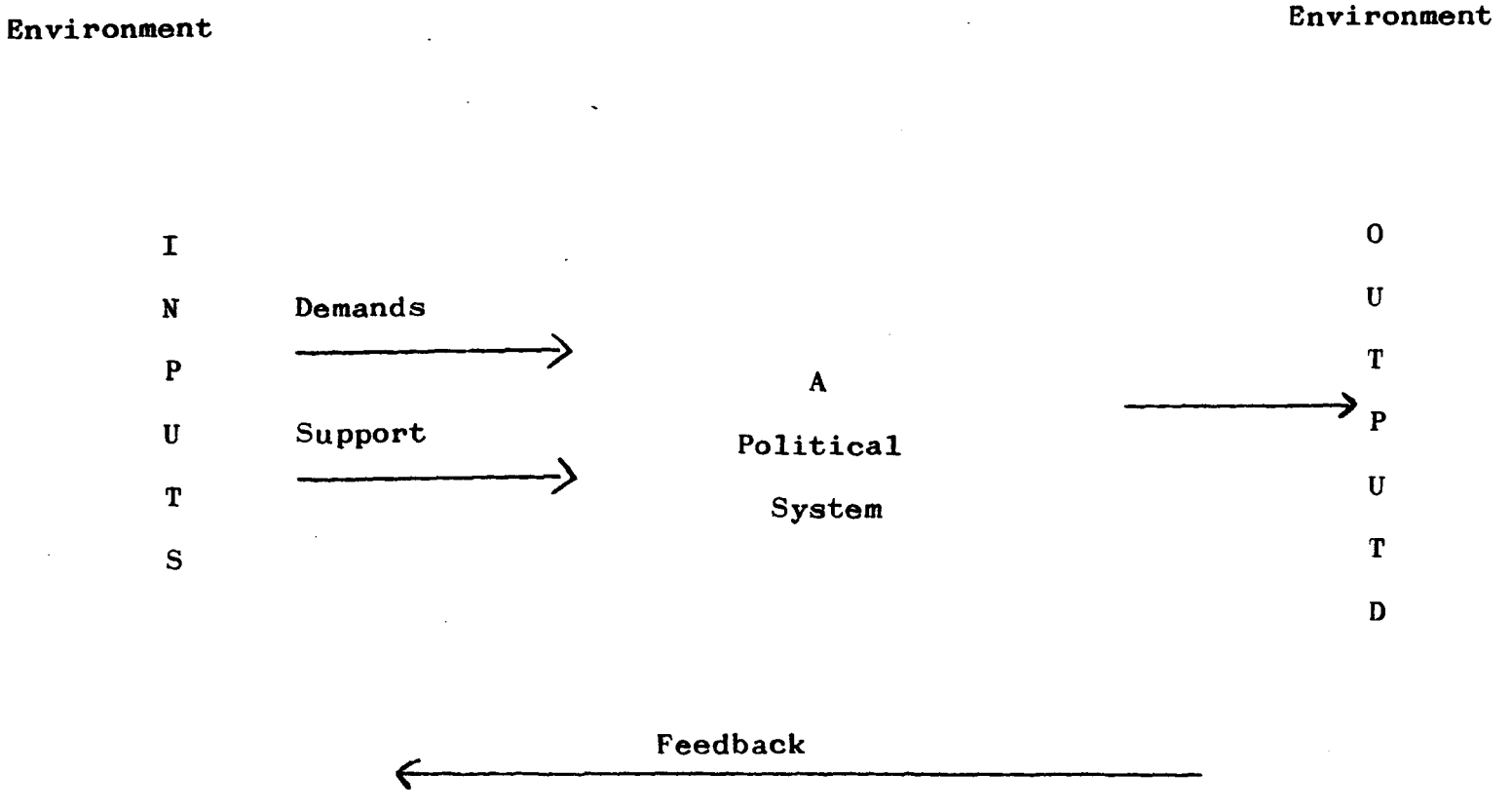
We can see that he views political life as a system containing several inter-related parts. These are an environment, inputs, a political system, outputs and feedback.

Easton argues that the political system does not exist in a vacuum . It has its own unique environment. " The way in which a system works will be in part, a function of its response to the total social, biological and physical environment. " [51] Easton qualifies this statement by pointing out that " the boundary of a political system is defined by all those actions more or less directly related to the making of binding decisions for a society; every social action that does not partake of this characteristic will be excluded from the system and thereby will automatically be viewed as an external variable in the environment ". [52]

All systems, except those which are approaching entropy, require energy. The energy which is received by the system is called inputs. Inputs, then, are the resources consumed by the system which allow it to survive and function. Easton sees two types of inputs -

Figure III - 1

Easton's Model of the Political System



demands and support.

" The reason why a political system emerges in a society at all - that is, why men engage in political activity - is that demands are being made by persons or groups in the society that cannot be fully satisfied." [53] Many demands which arise in society do not require the attention of the political system and are dealt with by other systems (economic, cultural etc.). Only when the conflict requires an authoritative decision is the demand funnelled into the political system.

External demands are the result of environmental pressures in culture, the economy, personality and social structure, for example, which help to shape the kinds of demands. In the U. S. this is reflected in demands which enhance the possibility of acquiring personal wealth. The Québecois, however, are more concerned with decisions which will preserve and enhance their linguistic and cultural rights.

Internal demands are the result of pressures within the political system which call for alterations in the relationship of members within the political system. The demand for devolution for Scotland can be viewed in this way. A simpler example is the need to revise constituency boundaries when population shifts occur in political systems which adopt the

principle of equal representation.

All systems require support if they are to survive. This support for the political system may be behavioural and manifest itself in phenomena like voting, paying taxes and joining the armed services to protect one's country in a period of war. Support may be attitudinal also, in that no overt action is required. Party loyalty, a general acceptance of the status quo and a belief in democratic government are examples.

Support, then, involves the provision of the human, material, economic and other resources required by the political system. It indicates an acceptance of the authoritative allocations and/or the general functioning of the political system.

What happens within the political system is the process of conversion. Conversion occurs when the political system accepts the resources provided by the environment, accepts the demands of the environment, conceived of as issues, and combines the two to produce the authoritative allocation of values or outputs. " In this sense, outputs are exemplified in the statutes of a legal system, administrative decision and actions, decrees, rules and other enunciated policies on the part of authorities, the informal consensus of a clan council, and even favours and benefits from authorities." [54]

The output has an effect on the political environment and the environment responds. It may respond passively if it accepts the decision. Those who appreciate the policy may indicate their approval through such actions as writing to politicians. Those who are opposed tend to make their objections known and to demand changes. This communication link between the political system and its environment is known as feedback. In the cybernetic models of Deutsch [55] and Vickers [56], feedback is a steering mechanism which provides a sense of direction for the political system and signals it to change course when conditions change. Easton views feedback in essentially the same way.

Easton's model is particularly valuable for a number of reasons. It stresses that the interaction of the various components can have an effect on policy. It suggests that the political environment may have an independent effect upon policy. It also indicates the possibility that the conversion process may exert an independent effect on public policy outputs.

It was these elements of Easton's model which attracted Dye to it. [57] He was attempting to develop a model which would assist him in a research project designed to describe and explain the variations in the policy outputs of American states.

Dye's Policy Model:

Dye was particularly intrigued by Easton's model's suggestive qualities insofar as the relationships between the socio-economic environment, the characteristics of the political system and policy outputs were concerned. His revisions of the Easton model were influenced greatly by the earlier work of Dawson and Robinson [58] and resulted in the input-output model presented in Figure III-2. [59]

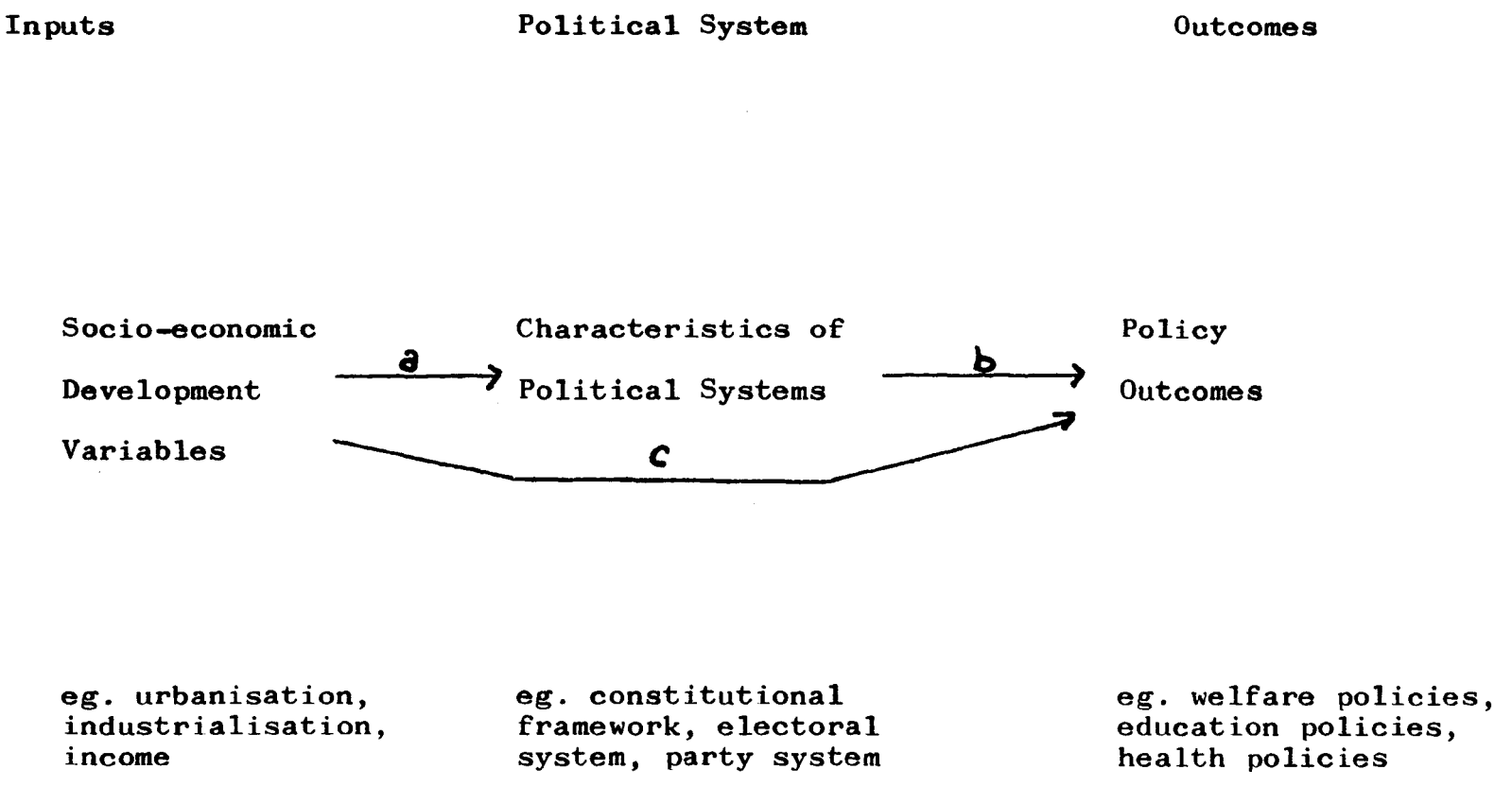
Dye described his model in the following way.

> Inputs are received into the political system in the form of both demands and support. Demands occur when individuals or groups, in response to perceived environmental conditions, act to promote goals, interests or actions. Support is rendered when individuals or groups accept the outcomes of elections, obey the laws and pay their taxes. The political system includes all of those institutions, structures and activities which function to transform demands into authoritative decisions requiring the support of society. Any system absorbs a variety of often conflicting demands, and in order to transform these demands into outputs (public policies), it must arrange settlements. The political system receives support insofar as it provides satisfying outputs and activates deeply rooted attachments to the system itself. [60]

It was the utility of the model to explain policy outputs which concerned Dye most, and linkages a,b and c were most important in this regard. " Linkages a and b suggest that socio-economic variables are inputs which shape the political system

Figure III - 2

Dye's Input - Output Policy Model



and that the character of the political system in turn determines policy outcomes. " [61] Thus, the environmental variables can have only an indirect effect upon the nature of policy outputs. " Linkage c, on the other hand suggests that socioeconomic variables affect public policy directly, without being mediated by system variables ." [62] By this Dye means that although the political system still formulates public policy, it does not " independently influence policy outcomes ". [63]

In his selection of socio-economic development variables, Dye was influenced by a number of authors. Lipset had argued that economic development, as measured by income, industrialisation, urbanisation and education, was related to stable government. [64] Alford had demonstrated that industrialisation and urbanisation were related directly to national integration. [65] Lerner's work on political systems in the Middle East concluded that economic development was directly related to political stability in that area. [66]

Only two studies appeared to provide guidance on the direct links between socio-economic variables and policy outputs. Cutwright had found in his study of 76 states, that social security policy outputs were strongly related to economic development. [67]

Robinson and Dawson concluded that " the level of social welfare programs in the American states seems to be more a function of socio-economic factors, especially per capita income ". [68]

On the basis of these studies, Dye concluded that there should be four input variables - income, education, urbanisation and industrialisation. He selected twelve measures to describe four aspects of political system characteristics. The four characteristics were inter-party competition, party control of the state legislatures, voter participation and the degree of malapportionment. This selection was based upon an review of a large number of U. S. government studies conducted by political scientists and sociologists. [69]

Policy outcomes were measured by 90 different variables. For the most part, these were expressed as expenditure items. One example of this was per pupil expenditures as an indicator of education policy. Standardised expenditures were seen as an indicator of the commitment of the political system to particular policies and were, of course, policy outputs in their own right. Dye also included what may be described as service factors, such as the number of physicians per 1,000 population.

After extensive statistical analysis, Dye's conclusion was remarkably similar to that of Dawson

and Robinson. " Economic development variables are more influential than political system characteristics in shaping public policy in the states. " [70]

Dye's model is a major advance on the earlier models discussed previously and it bears directly on the type of research with which this project is concerned. It appears, however, that his input-outcome model contains serious weaknesses. Some result from terminological problems; some relate to the basic simplicity of the model; some result from the question of the model to non-U. S. situations; others result from the findings of more recent studies of the same type.

The terminological problems relate to the concept of outcomes. Dye uses the terms of output and outcome interchangeably. [71] This reflects the terminological confusion which Kerr finds in the policy studies literature. [72] For example, if the Greater Glasgow Health Board and the Orkney Health Board each spent £1,000,000 on hospitals, Dye's model would suggest that the only difference between the two policy outcomes would be the greater expenditures per capita on hospitals of the Orkney Health Board. It might well be, in this hypothetical case, that the Greater Glasgow Health Board spent this revenue on acute bed facilities while the Orkney

Health Board spent this revenue on expansion of the number of geriatric beds in its hospitals.

This problem becomes particularly acute when one attempts to examine policy variation by defining social policy in terms of expenditure. Davies makes the point that " expenditure can often be a bad indicator of other aspects of standards ". [73] Newton and Sharpe have argued recently that conceptualising policy in terms of expenditure levels and patterns may produce misleading results because such conceptualisation may not accurately reflect either service quantity or quality. [74] Sharkansky's studies found that only 38 percent of the relationships between spending and services were statistically significant and that, in some cases, the relationships were negative. He concludes that the " expenditure-service linkage does not appear to be strong ". [76] This suggests that the policy outcome should be viewed as a concept analytically distinct from the policy output.

This distinction between outputs (expenditures) and outcomes (services) does not resolve all of the problems relating to the treatment of policy as a dependent variable in Dye's model. Dye's research is cross-sectional and he tends to define policy in terms of gross expenditures most of the time. His general indicator of health policy, for example, is total health expenditures per capita. [77] The difficulty

with this approach is that it does not allow the researcher to pinpoint variation.[78]

Newton and Sharpe suggest that one way of resolving this difficulty is " to disaggregate total service expenditure to subfunctions ". [79] In the case of the NHS, this is relatively simple to do in a crude way. The NHS has been organised in such a way that three distinct elements appear to co-exist. These are the hospital service, practitioner services and community health services. [80] These three basic groupings can be more extensively disaggregated. In the case of practitioner services, four categories of medical service are evident. There are general medical practitioners, general dental practitioners, pharmaceutical services and general opthalmic services.[81] Although community health services can be subdivided into different functional areas [82], the official health board statistics do not do so and it is difficult to obtain accurate financial statistics on community health expenditures prior to 1976. For this reason, it has been decided not to disaggregate community health expenditure into its constituent elements. The most difficult decisions regarding the extent to which a general caregory of expenditure might be sub-divided involve hospital services. The 1976 Scottish Health Service Costs classify hospitals

into over 4o categories.[83] The same document provides cost information for 21 types of beds for a large percentage of all of the Scottish hospitals.[84]

After discussing the issue with several medical practitioners and health board officials, we decided to distinguish between only three elements of the hospital services in terms of expenditures. The first of these is expenditure on psychiatric beds. Historically, as a previous chapter demonstrates[85], the treatment of mental illness has been subject to a different organisational structure in Scotland than the other hospital services. In addition, the vast majority of cases have tended to receive treatment in specialised mental illness or mental deficiency institutions. Although this pattern is changing, the change in terms of treatment within non-specialised (non-psychiatric) hospitals has not yet become sufficiently extensive as to indicate a major shift in this direction.

The second expenditure classification for hospital services is expenditures on chronic beds. Parry points out that increasingly, chronic and geriatric care will consume a growing percentage of the total hospital resources because of the ageing population in Scotland.[86] In addition, the Scottish Home and Health Department views chronic care as an important element of the hospital service and has

reflected this recently by asking Scottish Health Boards to increase their stock of chronic care beds by reducing their stocks of acute care beds. [87]

The third classification of hospital expenditure groups together all other types of hospital beds' expenditures. There are two reasons for this classification. In many hospitals, such beds receive mixed use. [88] At one time they may be reserved for general surgery patients; at another time the same beds might be assigned to neuro-surgery patients. In such cases, the expenditure data do not allow us to determine precisely costs by bed usage. The second reason is that, although it might be theoretically possible to disaggregate further, the size of the population indicates that some caution in the total number of variables selected must be exercised.

Thus, in response to the need to disaggregate expenditures in order to pinpoint better variation, ten policy output variables have been developed. These are hospital expenditures, general beds' expenditures, chronic beds' expenditures, psychiatric beds' expenditures, general practitioner expenditures, dental expenditures, pharmaceutical expenditures, optical expenditures, community health expenditures and total health service expenditures.

The link between policy outputs (expenditures) and policy outcomes (services) used in this study

is a relatively simple one. It is assumed that the revenues are used to provide the appropriate service. For example, community health expenditures are used to provide the health visitors and other staff, the equipment and other administrative support necessary to offer the service.

The problem of disaggregating services, however, is as difficult a task as was the case for expenditures. In essence, the research attempts to reflect the most important service components, but at times, it has been limited by the availability of sufficiently precise data. In addition, the small population size means that considerable care should be taken in limiting the number of variables selected to a manageable level.

In the case of the hospitals, for three of the output variables, the selection of appropriate outcomes is relatively straightforward. The number of chronic beds, the number of psychiatric beds and the number of general beds should be related to the expenditures on these aspects of the hospital service. Two other aspects of the hospital service have also been viewed as of particular importance in Britain.[89] These are the number of doctors and the number of nurses. Although it is impossible to relate these service indicators precisely to bed-use expenditures

because of data limitations, they can be related to total hospital expenditures. Similarly, the total number of hospital beds can be related to hospital expenditures.

In the case of practitioner services, a service element for each expenditure item has been included. These are the number of general practitioners, the number of dentists, the number of pharmaceutical chemists' outlets [90] and the number of opticians.

In the case of the community health services, the data did not allow for precise disaggregation of service indicators. For this reason, community health service policy outcomes are measured by the total number of community health staff.

This conceptualisation of policy outcomes relates to services only in terms of quantity. It does not reflect the quality of the services provided. It does not indicate the efficiency with which the service operates in terms of case load, length of stay in hospital, improvements in health status of the population or the number of patients treated. It represents simply, some of the dimensions of NHS staffing and facilities in Scotland which are provided in the various regions for the use of the appropriate clientele.

Links Between the Policy Environment and the Policy-Makers:

One of the most serious criticisms of Dye's

model and the socio-economic public policy input-output approach, in general, is presented by Dearlove. His major critique centres around the failure of Dye's model to adequately describe the linkage between the socio-economic environment and public policy. " The linkage problem, and the deficiencies of the demographic approach in handling this, really lies at the heart of the limitations of this work. " [91] He argues that " we are not really offered hypotheses which suggest why we can expect these associations and neither are we told just how it is that certain socio-economic conditions are translated into public policies by the structures of government which, statistical analysis or no statistical analysis, have a part to play ". [92] Dye admits that his research " does not in itself increase our understanding of the functioning of political systems ". [93] As Dearlove points out, socio-economic development variables do not make demands. [94]

Smith makes a similar point in a different fashion. He points out that:

> It may be that statistically policy-making as measured by levels and types of expenditures is correlated with demographic and socio-economic variables which push aside the claims of voters, parties and even leaders. Nevertheless, there has to be some reaction to such variables. Human agents have to choose to do something about slums, poverty

> pollution and disease - indeed, they have to invent such words to show disapproval of certain social phenomena. Ultimately, policy-making can only be explained by the ideas and opinions of people. [95]

Unlike Dearlove, Smith points out that these linkages have been examined extensively in a variety of countries. He examines, in a general fashion, for the United Kingdom, the processes by which demands emerge from the economic, social and cultural structures of British society and become issues through such mechanisms as elections, parties, pressure groups, legislative behaviour and political communication. [96] It is interesting to note that Dearlove provides a similar examination of such linkages in his study. [97]

It may be, however, that Dearlove's argument is inappropriate only at the kind of general level of political analysis which is represented by the nature of Smith's book. At a more detailed and specific level, the means by which socio-economic conditions influence public policy may be inadequately treated by the input-output studies. A review of some of the important policy literature suggests that this is not the case. Indeed, a number of possible links have been indicated and studied.

One of the simplest of the possible linkages which has been developed views socio-economic conditions as providing resources which constrain the

options available to the policy-maker. Heclo argues that " economic forces have shaped the raw materials with which social policy has had to work ". [98] In both Britain and Sweden social policy seems to have been built upon a " base of primary social security and economic standards ". [99] Heclo shows how the precondition of urbanisation helps to explain the differences between the two countries in the development and use of workhouses. Rose points out that " economic growth has been a policy that is immediately attractive to governors in Western and non-Western countries, because it promises a seemingly painless way to increase resources for public policy ". [100]

What Heclo is suggesting is that the nature of the socio-economic environments affects the type of policy which will emerge. Thus the reponse to poverty and unemployment in urbanised England was different from the response to the same problem in the largely agricultural Sweden of the nineteenth century. What Rose's arguments indicate is that as society becomes wealthier, (normally a process which co-incides with industrialisation and urbanisation) policy-makers have access to more money to spend on social policy.

A second conception of the link between the socio-economic environment and public policy relates

to differential rates of participation in either attempting to influence public policy-making or in actually assuming the position of policy-maker.

In the first situation, the evidence regarding socio-economic variation and participation is relatively clear. Blondel demonstrates that the poor are more likely than the rich to abstain from voting.[101] Milbrath points out that the upper and middle class citizen is more likely to engage actively in election campaigns,[102] and that this tendency also occurs for those in the middle and upper income ranges.[103] Blondel points out that the leadership of local party organisations tends to be over-representative of the middle class in Britain.[104] Milbrath's research indicates that people with higher incomes are more likely to join a political party than is the case for people with low incomes.[105]

In the case of interest group activity, Almond and Verba found a greater sense of political efficacy among the managerial and professional occupational groups in Britain than for the skilled and manual workers.[106] They also found a greater tendency to join, form and take an active part in informal and formal pressure groups in the United Kingdom amongst the well-educated than for the more poorly-educated population.[107] Milbrath also points out that higher

income earners are more likely " to initiate direct contacts with public officials " [108] in order to influence policy than are poorly-paid people. Milbrath demonstrates that urban dwellers are more likely to become active in politics than rural residents. [109]

Orum summarises this phenomenon nicely.

> There is virtually no empirical study now available which does not show a reasonably strong positive correlation between socioeconomic status (SES) and political participation. That is, the higher one's standing in the stratification hierarchy of a society in terms of SES, the higher the rate of one's political participation. This observation holds true for whatever measures are employed to reflect the underlying dimensions of SES - occupational rank, level of educational attainment, amount of family income, or the three combined - as well as for a wide variety of indices of political participation - ranging from voting turnout to the more extensive forms. [110]

The second situation which relates to the relationship between socio-economic factors and decision-making positions in society is equally clear and follows a similar pattern to than indicated above. The middle and upper classes are over-represented in positions of power. The poor are badly under-represented.

Blondel's short book provides ample evidence to support such a claim. In terms of parliamentary candidates, he finds that " men from the middle classes

take the lion's share ". [111] M. P.'s are drawn from rather more exclusive backgrounds than unsuccessful candidates. [112] Cabinet ministers and parliamentary party leaders tend to have more exclusive backgrounds than other Members of Parliament. [113] He finds that recruitment to the higher civil service tends to have a middle class bias. " Only 3 per cent of these higher civil servants come from families of semi-skilled and unskilled manual workers, which constitute over a quarter of the total working population of the country. " [114]

Thus, it appears that political participation reflects the social and economic inequality found in society generally. Alford and Frieland suggest that such patterns directly parallel the amounts of social and economic advantages groups possess; the greater the advantages, the more intense and extensive the level of citizen involvement in politics. [115] It should be no surprise, then, if the content of public policy reflects the biases inherent in the processes by which it is made.

A third link between the socio-economic policy environment and public policy has been developed by Deutsch and Peters in a number of publications. In Nerves of Government Deutsch discussed the important role which social mobilisation plays in changing the

nature of politics. This occured because social mobilisation involved major changes in people's lifestyles which resulted in " drastic changes in their needs ". [116] People experiencing social mobilisation required an increased range of government services and many new government services. Peters felt that social mobilisation, which he defined as the proportion of the population in non-agricultural employment, is an important factor which shapes the pressures for better social services from governments. [117]

Peters' research views the social mobilisation process as a three stage one in terms of the links between the socio-economic environment and public policy. " The first is through the increase of demands to modify the political system to allow greater inputs from those offered by the social mobilisation process. " [118] This suggests that social mobilisation results in the political mobilisation of the working class which is attempting to alter the nature of the political system as well as to increase social benefits. The second effect of social mobilisation is economic development. This involves " a lessening of the restraints of policy-making through the expansion of the resource base available for taxation ". [119] The final step in the process results in the institutionalisation of political demands through such organisations as trade unions

and the emergence of modern governmental bureaucracy.

Initially, then, changes in public policy are prompted by changes in the environment which result in increased demands for political access and social benefits by the working class. In later stages, the demands become channeled through institutions and those institutions play a more prominent and independent part in the policy-making process.

Peters' research regarding social changes and policy changes in Sweden over a long period of time tend to support the appropriateness of this view of the links between the environment and policy in that country.[120]

Deutsch's comments regarding altered needs which result from social mobilisation leads us to a fourth view of the relationship between the socio-economic environment and policy outputs. This concern for, and emphasis upon, need as determined by socio-economic indicators is best reflected in British output studies.

Bleddyn Davies was concerned about territorial justice in the provision of social services by local authorities.[121] He defined territorial justice as a " high correlation between indices of resources-use, or standards of provision and an index measuring the relative needs of an area's population for the service ".[122]

Needs were indicated by a weighted population index and a social conditions index.[123] He found that " the extensiveness, resource-use and performance indices for old people were more highly correlated with need than were similar indices for children's services. Most were positively correlated with need and some substantially, though not highly, so ".[124]

Boaden and Alford used such factors as population size and social class composition as indicators of need in their study of variation in English local authority decisions. They also examined the impact of such factors as dispositions (percentage Labour Party supporters on the councils) and resources (per capita ratecall). They found significant positive correlations between indicators of need and expenditure decisions. They also found that the political variable of disposition was an influential factor in explaining policy variation between local authorities.[126]

Boaden developed this idea even further in his book, Urban Policy-Making. He argued that need could be viewed in terms of the absence of facilities.[127] He also pointed out that " need for all the various personal health services will be higher among the less well-off sectors of the community ".[128] His research demonstrated that " policy-makers can themselves operate to convert environmental needs into effective pressures for decisions ".[129] The results indicated

that variation in policy outputs could be explained to a considerable degree by variations in the needs of local areas and that political factors such as disposition continued to play an important role.

Peters' comparative studies of public policy produce a more explicit suggestion regarding the relationship between needs and policy. [130] He argues that changes in policy outputs should be related over time to changes in conditions in the socio-economic environment which indicate the need for such services. He feels that policy-makers may also react to changes in the quality of the service which they provide. If the quality of the service declines (eg. an increase in infant mortality) then the appropriate response is to increase health expenditures until such time as the infant mortality rates assumes a more reasonable level. [131] " We could say, then, that the policy-making system responds cybernetically to its environment and apparently seeks to correct situations arising in that environment through expenditures. " [132]

This leads us in the direction of the general approach to policy-making taken by Vickers. [133] Vickers also views policy-making as a social-psychological phenomenon in which information can be used to " regulate " the system and in which " appreciations " of situations may change and result in different policy responses. This, in fact is the type of perspective

which led Dearlove to take " the view that in order to assess the impact and effect of environmental forces on the development of public policy, it was essential to note the psychological environment of those in government and to appreciate the way in which they imported the surrounding world into their decisional activity ". [134]

Dearlove's general critique of output studies appears to be unsupported in general terms by the evidence presented above. Of the four types of links between the environment and public policy which were discussed, one - the use of socio-economic variables as indicators of need - seems to fit both the British experience and Dearlove's particular view of policy-making. This " needs " approach, then, seems to be an appropriate basis upon which were can develop our own model of policy in the Scottish Health Service at a somewhat later stage.

The third serious issue about input-output studies centres around the question of their applicability to policy-making in the Scottish Health Service. The output studies done in the United States have attempted largely to explain policy variation between states. The U. S. constitution clearly establishes these entities as independent political systems in the sense that they are granted specific functional areas of jurisdiction and the right to raise funds through taxation. Other studies, like those of Cutwright and Peters have examined policy variation between countries. Once again, it is clear that these units

can be perceived legitimately as political systems with adequate independence to make decisions and policy.

In the case of British studies of this type, this issue has been raised in the context of the policy-making status of local authorities. Boaden [135] and Alt [136] see this as a problem which must be faced squarely. Boaden, in particular, devotes particular space to this question and demonstrates clearly that local authorities are not merely creatures of the central government. [137] His analysis indicates that local authorities have been able to respond to local conditions without central governmental interference and that they can be viewed as independent policy-makers in their own right.

In the case of the National Health Service in Scotland, the picture is even more confused than it is for English local authorities. Since 1974, when reorganisation came into effect, the Regional Health Boards have assumed direct legal responsibility for the administration of much of the NHS in Scotland. Prior to 1974, however, this authority was divided amongst three groups of structures. Local authorities were responsible for the local authority health services. Regional Hospital Boards and Boards of Management were responsible for the operation of the hospitals and the specialist services. Finally, Executive Councils were given

jurisdiction over much of the NHS activity with regard to general medical services, general dental services, pharmaceutical services and supplementary opthalmic services.

The question which remains unanswered is whether or not these agencies had sufficient authority and independence from central government to be viewed as distinctive policy-makers by themselves. By examining the relevant legislation and referring to developments within the Scottish Health Service, an answer should be forthcoming.

The NHS (Scotland) Act of 1947 established the regional tripartite structure mentioned above. Boaden and others have already demonstrated the independent status of local authorities with regard to local authority health services and , thus, there is no need to duplicate such work.

In the case of hospital and specialist services, Regional Hospital Boards were established to administer the hospital and specialist services in their areas. Boards of Management were constituted to control and manage individual or groups of hospitals on behalf of the Regional Hospital Boards. These Boards had the power to hire staff and to determine pay and conditions of employment for their employees. The statute also provided that these Boards were legally responsible for

their actions and could not claim legal immunity.

In the case of the general medical, dental, pharmaceutical and supplementary opthalmic services, Executive Councils were established for each area. They were charged with the responsibility of ensuring that arrangments were made within their areas for the provision of the appropriate service for all persons who lived in the area.

The statute also provided that all of these agencies - Regional Hospital Boards, Executive Councils and local authorities - were to receive annual grants of money from Parliament which would allow them to carry out their responsibilities.

The NHS (Scotland) Act of 1972 provided a new unified administrative system based upon fifteen Regional Health Boards which replaced the old tripartite structure. The Act gave all responsibilities which had previously been in the hands of the Regional Hospital Boards, Boards of Management, Executive Councils and local authorities to the new Health Boards as well as responsibility for the school health services. The new Health Boards remained legally responsible for their actions.

Clearly, the statutory power which was granted to the relevant agencies within the Scottish Health Service was considerable. Although the Secretary

of State for Scotland was empowered to intervene, issue regulations and over-rule the decisions of such agencies, a careful review of the Annual Reports of the Department of Health for Scotland and the Scottish Home and Health Department from 1947 to 1976 indicates that this intervention was rare. Most of the time the regional agencies were free to act as they saw fit. [138]

The previous chapters have indicated that there was considerable regional variation within the National Health Service in Scotland during this period. By 1976, the Regional Health Boards were directly responsible for spending £424,157,130 in ordinary revenue accounts. [139] This constituted 73 percent of the total expenditure on the NHS in Scotland for that year. [140]

Klein summarises the situation nicely.

> The case of the NHS, where there are just as many local variations in the distribution of resources and in the way they are used as in local authority services, suggests that a sharp distinction must be drawn between the appearance and the reality of central power, between dignified and effective power. [141]

The evidence presented above suggests that those agencies responsible for the local and regional administration of the NHS in Scotland did exercise considerable independence in making policy decisions. The input-output approach used by Dye does seem to be appropriate for the study of factors which influenced the policies made by the regional health agencies.

The more recent studies, as well as Dye's own conclusions, indicate that some change is required in the variables included in the model. Dye's research demonstrates that income is the most powerful socio-economic development variable and that education has little impact upon public policy. [142]

Hofferbert has attempted to examine input variables over time. [143] His examination of a variety of socio-economic variables in the U.S. from 1890 - 1960 produces a conclusion that industrialisation and regional cultural factors have been the most pervasive socio-economic influences upon policy over time.

The influence of region upon public policy has been examined by Sharkansky in two studies. In an article written in 1969, he discusses the utility of regional political culture as a variable capable of explaining policy outputs. [144] His conclusion that " political culture shows important relationships with several traits of state politics and public service " [145] reinforces the impact of Hofferbert's analysis. In an earlier study, Sharkansky examines the relationship between regionalism, economic development and policy outputs. [146] The results of this study confirm the importance of economic development variables, but they also indicate that " regional phenomena make a significant contribution

to the explanation of inter-state differences in policy that is independent of the current economic characteristics of the regions ". [147]

These more recent studies suggest that four variables - income, urbanisation, industrialisation and region - are significantly related to public policy. The use of these four factors raises three important issues. First, is it not possible that more socio-economic factors should be considered? Secondly, are these socio-economic indicators adequately related to need ? Finally, we should examine the problem of whether or not these four factors should constitute our only input variables.

The Input Variables:

Clearly, the existing research indicates that a number of other socio-economic variables could be included in our model. There are two general approaches to input-output research which do facilitate choice in this matter. Newton and Sharpe point out that the first of these consists of research efforts in which a large number of socio-economic variables are regressed with policy output variables. [148] Woolf's Research Study 5 for the Redcliffe Maud Commission is an excellent example of such an approach. [149] More recently, Jackson, Valencia and Bland use 52 independent variables as a basis from which they attempt to explain variation in the provision of financial aid through social work

in Scotland. [150] The advantage of this type of research is that it does sensitise us to potentially important research variables. [151]

The second type of research in this field is more theoretical. It attempts to develop " theoretical propositions " [152] about performance and policy and to test them against available data. The work of Boaden, Bleddyn Davies, Alt and Danziger are examples of this approach. They rely on fewer independent variables. Because our conceptual model has a specific theoretical orientation, this approach seems to be more useful. The U. S. cross-sectional research indicates that the four variables indicated above seem to the the most influential ones in explaining policy variation in a number of policy areas.

The second question related to the issue of whether the four variables selected are related to health needs. There is considerable American and British research on this matter. There are a few studies which apply to Scotland and some of the British output studies do examine the relationship between health expenditures and socio-economically determined needs.

The American studies on the relationship between income and health indicate that variation in income status is linked to variation in health status in terms of morbidity, mortality and unitilisation.

Anderson points out that " the National Health Survey disclosed that 29 percent of the population with family incomes below $2,000 suffer from chronic conditions that limit their usual activities, as against only 7.5 percent with family incomes above $7,000 ". [153] In another research project, he notes that a great deal of comparative research demonstrates that " per capita income is highly related to infant mortality ". [154] He notes that " despite these major differences in health, persons from low income families underutilise health services ". [155] Rice's research on this issue confirms Anderson's conclusions. [156]

The U.S. studies on the relationship between urbanisation and health need indicate that variations in urbanisation are linked to variation in health status. Anderson points out that there are significant rural-urban differences in morbidity and mortality. [157] In another article, he demonstrates that urbanisation results in increased hospital admission rates. [158] In a third study, he finds that urbanisation is related to the supply of health services available to the population. [159]

The U.S. studies on the relationship between industrialisation and health needs indicate that variations in the levels of industrialisation are linked to variations in health status. Tyroler reports

that " large scale industrialisation in North Carolina is linked to increased mortality rates for cardiovascular diseases ". [160] Anderson argues that industrialisation seems to be related to both morbidity and utilisation rates. [161]

Although U.S. studies do indicate that regional differences in mortality, morbidity and utilisation do exist, they tend to explain these differences in terms of the differing socio-economic nature of the state populations. Hart, on the other hand, demonstrates that this is not the case in England and Wales. She finds that, in terms of mortality, " the regional influence is separate and additional to that of social class ". [162]

Many of the British studies are limited because the census does not supply data regarding personal income. As a result, many of the researchers use social class as a basis for their studies. Tudor Hart points out that there are differences in mortality rates between heavily industrialised and less industrialised areas of Britain. [163] In his review of Cochrane's Effectiveness and Efficiency, Tudor Hart argues that " Professor Cochrane dismisses social inequality in the NHS without any examination of the evidence of a widening social gap in mortality in Britain or of large and increasing geographic differences in

mortality ". [164] Cartwright and OBrien's review of the evidence regarding utilisation and socio-economic factors demonstrates clearly the relative underutilisation of the health services by the lower socio-economic groups in British society. [165] Finally, Hart's excellent examination of the subject strongly supports the view that variations in mortality, morbidity and utilisation are linked to regional and, more importantly, social class differences in Britain. [166]

Recently, Brotherston has drawn upon the research done by G. M. McIllwaine. [167] The latter demonstrated that in the most urbanised and industrialised area of Scotland, Glasgow, mortality and morbidity rates were higher than the Scottish average. The thesis also showed that for a variety of reasons, health service facilities were underutilised by the poorest residents of the city. Brotherston used this, and other data, to support an argument that a policy of positive discrimination might be needed to equalise opportunity for the multiply-deprived in Scotland. [168]

The importance of regional differences and health in Scotland have been recognised for a considerable period of time. The Dewar Committee reported in 1912 that the existing practice of medicine was " grossly inadequate to meet the medical needs of the Highlands ". [169] It recommended special measures to remedy this situation. In 1913 the Highlands and Islands (Medical

Service) Grant Act came into effect. It established a distinctive pattern of service based upon family practitioners which continued to exist until re-organisation came into effect in 1974.

British output studies have demonstrated that these types of variables are appropriate. Bleddyn Davies found that need as defined by his indices was related to output. [170] Boaden found that health spending in English local authorities was related to social class and urbanisation. [171] Noyce, Snaith and Trickey found that community health expenditures appeared to be related to the social class composition of the population of the area. [172]

The material presented above suggests that income, urbanisation, industrialisation and region are linked to health needs as determined by mortality, morbidity and utilisation. The evidence also indicates that these variables appear to be related to policy outputs as measured by health service expenditures of local authorities or area health boards in England and Wales.

Although the evidence presented above does suggest a statistical relationship between health status and socio-economic factors, it may well be that the Scottish Health Service policy-makers are more directly concerned with the former information than the latter.

Deutsch [173] and Vickers [174] both suggest that policy-makers may be selective about the sources and types of information which they accept. Dearlove demonstrates that this is the case in his study. [175] Peters indicates that it is more logical to think of policy-makers in the health services as being responsive to health needs indicators rather than to more general socio-economic changes in society. [176]

There is some indirect evidence to support this view, in terms of the type of statistical information which the Scottish Home and Health Department collects regularly to assist it in carrying out its responsibilities. Much of the material is published annually in the Annual Report of the Department, the Scottish Hospital In-Patient Enquiry and the Scottish Health Statistics.

The Annual Reports of the Scottish Home and Health Department follow the pattern of the first Report which was published in 1930. It provided particular attention to mortality and morbidity statistics. [177] The 1957 Annual Report again focussed much of its presentation on a description of mortality and morbidity. It did, however, indicate a recognition of the fact that variation in morbidity and mortality rates could be caused, at least in part, by differences in socio-economic conditions. [178] The 1977 Report examines health

trends in terms of mortality and morbidity once again. There is no serious mention of socio-economic - health status relationships within this Report.[179]

The Scottish Hospital In-Patient Statistics provides a good deal of information regarding diagnosis, turnover, utilisation and mortality. Some of this basic data is expressed in terms of age, sex and region. There is, however, no attempt to relate any of the basic information to socio-economic factors such as social class, income or urbanisation.[180]

The Scottish Health Statistics comprise the most extensive collection of data regarding the NHS in Scotland. It provides a great deal of useful information regarding morbidity, mortality, staffing, utilisation and costs.[181] None of this material is related to socio-economic factors. Fortunately, the most recent issues of this publication do provide much of this information in terms of Health Board regions.

In terms of the type of information which the National Health Service policy-makers in Scotland collect and publish, this brief review of some of the most important items supports the idea expressed above. The data does not refer to socio-economic factors which might reflect health need. Rather, the statistics tend to concentrate on what might be construed as more direct measures of health status.

If this is the case, then the model requires that more health-specific indicators of need be developed. Unfortunately, this is not a simple task. There are a large number of definitions of health from which indicators of need should logically follow. Hart argues that health definitions fall into two general categories. The first group of definitions denote " human welfare, a summary of all the things which promote physical and mental well-being for individuals in society ". [182] The second category views health as " physiological order in the human body, the absence of disease, sickness and disability ". [183] Culyer complicates the picture even further. He points out that it is essential to distinguish between demand and need and that there is a difference between a health need and a health care need. [184] Wiseman concludes that " the measurement of needs presents a number of problems. However, what emerges from the literature on the subject is fairly widespread agreement that the felt need experienced by individuals, needs as defined by others and the demand for treatment and services to which these give rise are by no means equivalent measures ". [185]

Although there is no agreement on a precise definition of the concept of health need, there is some agreement that proxy measures which provide indicators

of need do exist and are used. [186] For the purposes of our model " we shall...simply regard a state of health indicator as complementary to the corresponding need indicator ". [187]

Four types of state of health indicators appear commonly in the literature. These are mortality, morbidity, self-reported illness and health status indices indicators. By examining each of these types of indicator in turn, we may be able to select indicators which are most useful for our purposes.

Mortality rates are both readily available and reasonably clear. [188] Hetzel argues that mortality rates have been among the generally accepted health indicators. [189] Navarro points out that mortality data is more reliable than morbidity data and is usually available annually for most areas, but he also argues that technological, demographic and socio-economic changes condition changes...in mortality. [190] Culyer raises the interesting question of which mortality rates should be used. He points out that a high crude death rate may exist in societies with low infant mortality rates. Even when age-sex controls are included in standardising mortality rates, he shows that infant mortality rates do not always move invariably with standardised mortality rates. [191] Hart points out that mortality rates are not as easily interpreted

as originally thought. There are errors of omission in the calculation of standardised mortality rates and errors of recording which distort the results. [192] As well, age-specific mortality data " is far more clearly linked with health as human welfare " [193] rather than the physiological conception of health.

Navarro argues that " morbidity data have often been overlooked in the planning of health services ". [194] Forsyth and Logan [195] and Buck [196], in Britain, have used morbidity patterns in various populations such as hospital patients to calculate the health resources needed to cope with the morbidity reported. The Hospital In-Patient Enquiry provides a great deal of morbidity data, but it may be merely a reflection of " inequalities in the availability of hospital specialist care rather than any underlying indicator of need ". [197] As well, " suitable measures of need in the form of morbidity data are notorious for their absence from routinely available data ". [198] Goldsmith argues that morbidity is conceptually and pragmatically more difficult to use as a health status indicator. [199] He uses Zola's study, which found that levels and types of complaints varied among different ethnic groups for the same apparent clinically evidence diseases to show that " obviously, morbidity does not equal morbidity ". [200]

Self-reported illness has been tapped in a

number of countries. In the U. S. the National Health Survey made extensive use of morbidity indicators. It provided data on acute and chronic conditions, days lost from work, activity limitation and hospital care. The General Household Survey provided similar types of data in Britain. Culyer has stated that " these morbidity data are of crucial importance ". [201] Hart pointed out that such data helps to overcome some of the deficiencies with traditional morbidity data.[202]

Hart also notes that " there is a lack of fit between self-reported rates of sickness and rates of consultation with both general practitioners and specialists ". [203] Klein says that the General Household Survey has been used to suggest that there is " a potential tidal wave of demand for medical care ". [204] Goldsmith finds that there are serious problems of reliability and validity with such data. [205]

The fourth approach involves the use of health status indices. Williams suggests that the use of an index involving " a set of descriptive categories concerned with the client's state in terms of pain-free social functioning, a relative evaluation process that converts these states into index points and an absolute valuation of points in money terms " is a good idea. [206] Culyer feels that a similar type of index to that of Williams, which is geared to more specific types of

diseases of population groups would be most helpful. [207] Miller's Q index has provided particularly valuable information which has facilitated policy decisions in the Indian Health Service in the U.S. [208] Goldsmith reviews a number of health status indices, which have been developed in the U.S. He finds that there are serious problems with them in terms of conceptualisation and value judgements. [209] He also feels that it is unlikely that there will be a breakthrough, which might produce an adequate and generally accepted health status index in the foreseeable future. [210]

Although each of these types of health indicators has some merit, each one presents several disadvantages. It appears that mortality offers both the most common and most reliable evidence regarding health status. This co-incides with Hetzel's argument. [211] Anderson argues that " high mortality rates are widely recognised as a significant health problem ". [212] Three mortality indicators seem to be relevant to our research. These are infant mortality rates, standardised mortality rates and crude death rates.

Anderson's research suggests that infant mortality is a sensitive indicator of an area's health status. [213] Bleddyn Davies points out that infant mortality rates also serve as a traditional indicator of morbidity. [214] Hetzel supports the usefulness of infant mortality as a health indicator. [215]

In the Scottish case, infant mortality is a particularly important area of concern. The World Health Statistics show that the rate in Scotland is higher than is the case for most of Europe. [216] In addition, Parry notes that " in Scotland infant mortality varies by a factor of nearly two in different parts of the country ". [217] He states that " there is a need to improve the outlook for infants in certain areas ". [218] This concern is reflected officially by the Scottish Home and Health Department in a special study, Infant Mortality in Scotland, which it published in the early 1970's. [219]

Hart points out some of the advantages in using the Standardised Mortality Rate. " The SMR of the five social classes come closest to a valid estimate of inequalities in disease because of the fit between the two data sources used in its composition. " [220] In addition, SMR's more closely associate with the definition of health provided by the World Health Organisation. [221]

In the Scottish case, the link is even more direct. In the Share Report, the Scottish Home and Health Department appears to have taken the view that financial resource allocation should be based upon need. The authors of the Report feel that " Standardised Mortality Ratios provide the best available indicators of need ". [222] Despite problems such as patient flows,

the Scottish Home and Health Department has attempted to deal with them within the context of use of SMR's.

Hetzel argues that crude death rates are useful indicators and that they have, and should continue to receive considerable attention. [223] Jones and Bourne use crude death rates as an indicator of need in their study of the NHS in England and Wales. They claim that it better reflects the actual workload of the National Health Service. [224] Unlike SMR's, the crude death rate, refers to the actual death rate in an area rather than a statistically artificial rate in which age and sex are controlled.

The Link Between Need and Policy:

Thus far our model suggests a mechanism in which policy-makers in the Scottish Health Service respond to information about the environment. This information may reflect general socio-economic conditions or more direct health-related indicators of need. At this stage, it is simplistic in that it assumes a virtually automatic stimulus-response situation in which information cues stimulate a prompt policy response.

Initially, it appears that such a model corresponds with the results of many comparative output studies. Klein notes that " the evidence that it is socio-economic rather than political factors that influence movements in public expenditure is strong ". [225]

However, as Dearlove has pointed out [226], and as Smith has argued [227], policy-making does not take place in a vacuum. It may well be, as Dye admits, that researchers have not looked at more appropriate political factors. [228] More recently, Alt has presented a case for more extensive " development of political indicators ". [229]

In fact, recent studies in both the U.S. and Britain suggest that political variables do play an important role in determining policy outputs. Sharkansky refers to them as government structure variables.

One aspect which Sharkansky considers is the impact of the process by which governments make decisions about expenditure allocation. [230] In the British case, two approaches seem appropriate for further elaboration. These are economic rationality and incrementalist models.

There are a number of economic rationality models available in the literature. The one which attracts the most attention is PPBS. The Planning-Programming-Budgeting System is an approach which is officially part of the policy-making process of a number of countries including Canada and the U.S. PPBS consists of four inter-connected elements - planning, programming, budgeting and evaluation. [234]

Planning may be defined as " the production of

the range of meaningful potentials of the selection of courses of action through a systematic consideration of alternatives ". [232] Allan Schick describes the planning process as a code involving three tenets.

> 1.Planning is future-oriented; it connects present decisions to the attainment of a desired future state of affairs.
> 2. Planning, ideally encompasses all resources involved in the attainment of future objective. It strives for comprehensiveness. The master plan is the one that brings within its scope, all relevant factors.
> 3. Planning is means-ends oriented. The allocation of resources is strictly dictated by the ends that are to be accomplished. [233]

Once long range plans have been established, the more specific determination of " the manpower, materials and facilities for accomplishing a programme " [234] must be carried out. In other words, a programme is " a package which encompasses each and every one of the agency efforts to achieve a particular objective ". [235]

Evaluation " is an integral part of the programme budget process and includes the study of objectives and of alternative ways of achieving them, of future environments and of contingencies and how to respond to them ". [236] The programme inputs must, to some extent, be quantifiable in terms of dollars, pounds or units. In this way, meaningful cost-benefit analyses tell officials how successful the programme has been in converting resources into outputs.

As a budgetary device PPBS attempts to:

1. facilitate the maningful measurement of the total money costs of accomplishing defined objectives;
2. clearly identify the future cost implications inherent in near-term financial commitments;
3. facilitate comparison of cost-inputs and achievement-outputs when related segments of a single programme are administered by different management units;
4. facilitate the comparison of alternative ways to accomplish a given objective;
5. delineate the objectives of discrete spending commitments in such terms that significant cost-effectiveness analyses can be carried out;
6. make it possible to aggregate related expenditures wherever they occur in the government's sprawling administrative structure. 237

Under the Wilson and Heath Governments there were a number of changes which suggested that an effort to move in the direction suggested by PPBS was underway. One of the first of these steps involved the creation by Mr. Wilson of the Department of Economic Affairs under Mr. George Brown. This Department was to be heavily engaged in economic planning and in assisting the Government in determining the country's economic priorities. For a variety of reasons, the Department failed to develop properly and it was wound up in 1969.

Mr. Wilson also began the practice of bringing in outsiders to the Cabinet Office. The first of these

was Mr. Thomas Balogh, an expert in economic planning and policy. Mr. Heath carried this development further. He established the Central Policy Review Staff. Its responsibilities were to review the government's overall strategy in applying its programme and to " undertake study projects with the aim of helping to evaluate the Government's policy and the options open to Government, in almost any area ". [238] When Wilson was returned to office in 1974, he added a new policy unit under Dr. Donahue to advise on short-term domestic policy.

The Treasury had been developing a system of long-term reviews of public expenditures since 1962. These reviews became the responsibility of the Public Expenditure Survey Committee. Its major concern was the allocation of resources to departments on a medium and long-term basis. Mr. Heath added the Programme Analysis Review. Its role was to assess statements of priorities and objectives submitted by departments before allocations could commence.

In the case of the Scottish Home and Health Department, there is some evidence which suggests similar efforts to develop an infrastructure which would facilitate more rational policy-making. This is particularly true in recent years.

As a result of reorganisation, a Planning

Council with a Secretariat has been established to study and to advise the Secretary of State regarding new policies. The Scottish Institute for Operational Research was hired and " put forward proposals for a systematic yet participative planning system which SHHD have used to guide them in the development of planning within the new organisational structure at the national level ". [239]

Even earlier, however, there was evidence of more rational approaches to policy-making being applied in the NHS in Scotland. One of the best examples involved the hospital plan. The plan formulated objectives, priorities and a time frame. In 1965 it was revised because the objectives had been sharpened and because careful monitoring of the implementation of the plan indicated that some changes were required. [240]

Clearly, there is some evidence to suggest that policy-making in the NHS in Scotland does resemble the type of rationality involved in PPBS.

The economic rationality approaches to policy-making have been most strongly attacked by Wildavsky. [241] He argued that no one could do PPBS. His own studies demonstrated that the actual budgeting process was quite different from PPBS. The budget makers tended to work from previous budgets and make slight adjustments - usually upwards - to the amounts to be spent by a

department. The work of Crecine [242] and Sharkansky [243] tended to support such conclusions.

Charles Lindblom extended the argument of Wildavsky even further. [244] He suggested that this incrementalist approach to budgeting was also applicable to policy-making in general. He argued that the most important decisions in a society were taken by the proximate policy-makers. Their freedom to make policy was circumscribed by the political and socio-economic environment around them. In a democracy, these constraints were viewed as being particularly limiting.

The result of these limitations is that policy-makers have only sufficient power to alter policy marginally in any one direction. Once the incremental change is made, an evaluation of the reaction to it is necessary. Only if the public response is favourable, should the policy-maker consider further policy changes in the desired direction.

Such an approach minimises the political, economic and social risks inherent in the more rational policy-making processes. The policy-maker can test public opinion without fearing that he has committed tremendous expenditures to what are politically and socially harmful purposes. He can, as well, withdraw from the new policy position if that position is seen to be untenable.

Sharkansky's study of spending patterns suggests that incrementalism is a characteristic of the political system which has tremendous impact upon the policy outputs. [245] Danziger has examined expenditure policy-making in English local authorities. He found that " existing expenditure clearly dominates the new level of allocation " [246] and that " the most fundamental axiom of incrementalism, stability in the outputs, is again comfirmed ". [247]

Brotherston's comments regarding the planning and budgeting process in the Scottish Home and Health Department indicate that the same process seems to be equally applicable to the study of the Scottish Health Service. [248] Wiseman's research into planning and policy-making in the Scottish Home and Health Department indicates that the process was incrementalist in the past. [249]

Policy-making at the regional level in the Scottish Health Service has been investigated recently by Hunter. He examined policy-making in two Scottish Health Boards since reorganisation in an effort " to look into the black box which comprises the decision process ". [250] He found a number of internal and external constraints which limited the ability of Health Board policy-makers to take decisions on a rational basis. He concluded that the process of

policy-making in Scottish Health Boards could best be understoood as a very distinct example of disjointed incrementalism. [251]

Obviously, there is a good deal of evidence, some of which is quite detailed, which indicates that the prevailing decision-making approach used in the National Health Service in Scotland is incrementalist.

Dye discovered that senior levels of government had a major influence upon the policy outputs of subordinate levels of government and suggested that this phenomenon should be considered in future studies. [252] Sharkansky examined this aspect of the research problem in the study of American states' spending patterns which he undertook. [253] He found that the amount of federal financial aid received by a state showed " positive relationships with current spending ". [254]

The structure of the NHS is considerably different from that of the U.S. Government. In some cases of expenditure, such as general pharmaceutical services, the Health Board acts basically as an agent of the central government and has little control over the expenditures on this type of service. In other areas, such as health centre planning, however, the Health Boards have considerably more independent authority. Even in areas such as hospital planning, however, they remain subject to the policy directives of the Scottish

Home and Health Department. A recent example of this is the policy statement of the Department calling upon the Health Board to expand its number of chronic beds by reducing the number of acute beds. [255] In the sense of ability which the senior partner has to influence the priorities of the subordinate partner in the Scottish Health Service, this characteristic of the political system may have considerable influence upon the policy outputs of the area Health Boards.

Although elite studies of public policy may not be sufficiently clear as to indicate that elitist influences determine all politcal decisions, there is considerable evidence that the medical profession does have great influence upon the policy-making process in the NHS. As Klein and Crossman point out, the consultants in the more glamorous specialities such as surgery are particularly important in this regard. [256] Wiseman notes that " the health professions, particularly doctors, had an extremely important influence on which issues were regarded as important both directly through the professional advisory committees which med regularly with SHHD officials and from time to time through the publication of reports on particular topics by the various Royal Colleges ". [257] In this context, the influence of medical schools and their affiliated teaching hospitals is particularly important.

The medical schools and teaching hospitals have had an important role to play in the development of the Scottish Health Service. The original hospital regions established in 1948 made provision for the existence of a medical faculty and teaching hospital facilities in each region with one exception. In the case of the Highlands (Northern Region), a major effort was made to improve the facilities available at Inverness and to increase the supply of consultants in the area so that Inverness could function in the Highlands like Aberdeen, Dundee, Glasgow and Edinburgh in the other four regions. Carstairs and Heasman had demonstrated the relatively greater efficiency of teaching hospitals in Scotland. [258] The SHARE Report pointed out the greater expenditures incurred by teaching facilities and recommended that any new allocation system should be modified " in respect of the services provided by the four teaching Health Boards ". [259]

In his study of Spending in the American States, Sharkansky hypothesised that " measures of the .... bureaucracy reflect the size and past success of an interest group (employees) that works in favour of high spending. The measure of the bureaucracy's size may also reflect the magnitude of state services and their demands on the state budget ". [260] He discovered that a strong positive correlation existed between

the number of employees per population and both current and previous expenditures. [261]

This aspect of the problem has not been ignored in British studies. Rose has argued that the growth of the civil service is at some time significant in public policy. [262] Peters used the civil service rate as an important political variable in his study of income distribution in Sweden and the U.K. [263] Klein and Boaden have attempted to explain more precisely the nature of this relationship.

Klein accepts Down's argument that bureaucracies determine their success by their growth and will exert pressure to expand their own activities. [264] Boaden discusses the role of the civil service by assuming " that most officers have a concern for the professional values in their work and also wish to see their sphere of work expanded and developed. " [265]

In his study of care of the mentally ill in England and Wales, Klein found that the policy process could not be explained by common models. He suggested that more attention should be focussed on those who actually implement policy. His study indicates " the importance of organisational factors or bureaucratic politics ". [266]

On the basis of this review of much of the useful literature on the subject, it is now possible to present an input-output model which will facilitate

the study of regional variation in the Scottish Health Service

The Policy Model:

This model, obviously, is based upon the models developed by Easton and Dye. It is modified in the light of subsequent research conducted by scholars such as Sharkansky, Hofferbert, Boaden, Davies, Klein and Alt. The model also demonstrates an effort to include aspects of the Scottish Health Service which seem to be particularly relevant.

The model contains seven input variables relating to need. These are income, industrialisation, urbanisation, region, infant mortality rate, standardised mortality rate and crude death rate. There are four intervening government structure variables, which may also function directly as input variables. These are the size of the Health Board establishment, the number of teaching hospitals, the nature of the policy process and the influence of the senior levels of government. There are ten policy output variables - total expenditures, hospital expenditures, general beds' expenditures, chronic beds' expenditures, psychiatric beds' expenditures, general practitioner expenditures, dental expenditures, pharmaceutical chemists' expenditures, optical expenditures and community health expenditures. There are eleven policy

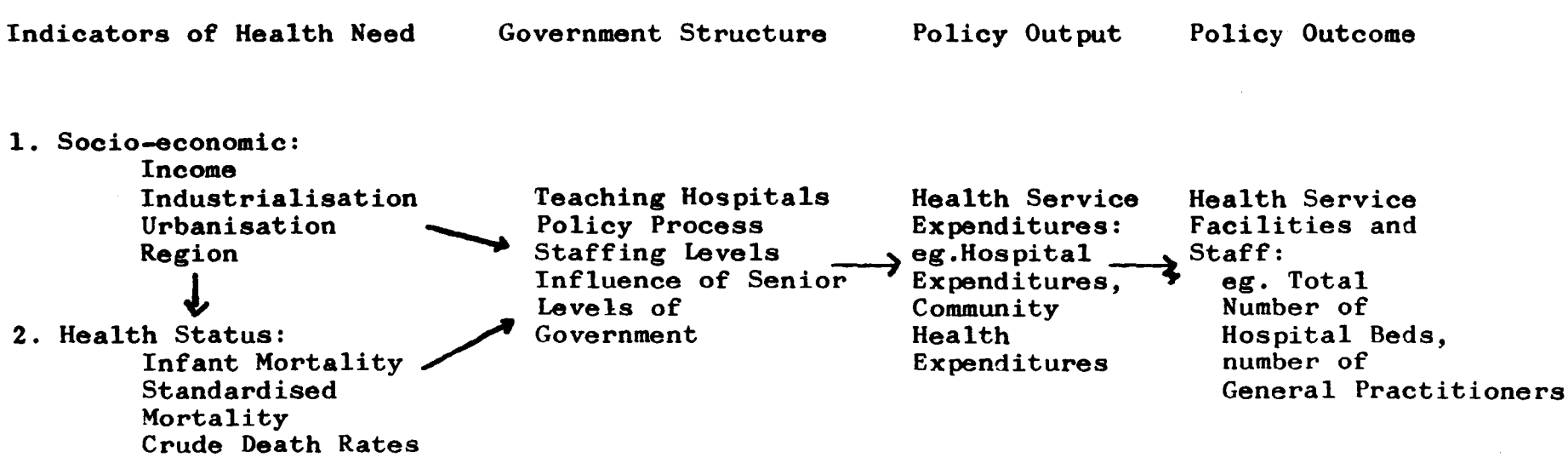
outcome indicators - the total number of hospital beds, the number of general beds, the number of chronic beds, the number of psychiatric beds, the number of hospital doctors, the number of hospital nurses, the number of general practitioners, the number of dentists, the number of pharmaceutical chemists' outlets, the number of opticians, and the number of community health staff.

The model views policy-making in the National Health Service in Scotland as a response to health needs which are indicated by conditions in the environment. Need can be expressed in a general way in terms of a number of socio-economic and demographic indicators. It can also be expressed as specific health status indicators.

In order for these characteristics " of the community to become a need to be met by public policies it must...be perceived by policy-makers as a problem ". [267] The model suggests four methods by which this linkage might occur. The first views environmental conditions as providers of resources and definers of options for policy-makers. [268] The second establishes the link in terms of socio-economically determined differential political participation rates. [269] The third views the link as the result of a social mobilisation process. [270] The fourth linkage assumes

Figure III - 3

An Input-Output Model of Policy in the Scottish Health Service



a cybernetic response to selected information which is monitored by the policy-makers and is viewed by them as being important in determining whether or not a policy response is required. [271] The model also indicates that the general indicators of need are related to the more direct indicators of health need. [272]

The model represents the situation of " policy maintenance " described by Dearlove by indicating a number of structural factors which may affect the ability and/or desire of the policy-makers to respond. [273] These include the influence of the teaching hospitals, the size of the Health Board bureaucracy, the nature of the policy process and the influence of senior levels of government.

The responses of the policy-makers to their perception of need takes the form of policy outputs which are expressed as expenditures. These expenditures are used by the policy-makers to provide the facilities and staff which provide health care for the public.

In constructing this model, an effort has been made to improve upon existing output models which have been found in a review of the literature. Following the suggestion of Newton and Sharpe [274], the model disaggregates the indicators of policy so that variations may be more closely pinpointed. As well, the model applies to variation over a considerable period of

time - 1951-1976. This meets Newton and Sharpe's concern that output studies be based upon observations over time. [275] It also allows us an opportunity to determine if we have isolated " a critical period in which modern expenditure patterns are fixed ". [276] Alt argues that " if such a period could be found (this) would constitute a worthwhile finding ". [277] The model comes to grips with the conceptual deficiencies of Dye's model in that it indicates links between the environment and public policy. Finally, the model extends the range of political variables to include governmental structure factors as Alt suggests. [278]

Chapter IV

The Formulation of Empirical Generalisations And Hypotheses

Introduction:

This chapter has two basic purposes. It attempts to provide empirical generalisations about policy variation in the Scottish Health Service and to develop hypotheses which facilitate an explanation of why the policy patterns which are indicated might exist.

The empirical generalisations focus upon three major concerns. The vast majority of the generalisations concentrate upon a description of the extent and/or presence of variation as determined by the twenty-one policy indicators developed in a previous chapter. The second group of generalisations refer to patterns of variation over time. The third group of empirical generalisations focus upon specific features of the conceptual model, especially the nature of the policy process.

The hypotheses result from insights drawn from the policy model referred to previously. There are three main foci here. The first effort is to determine the extent to which the eleven independent

variables individually explain the pattern(s) of variation which are found to exist. The second concern is to assess the explanatory power of the three groups of independent variables - socio-economic, health status and government structure -in relation to the policy variation. Finally, an effort is made to determine the most powerful explanatory factors in terms of individual and groups of independent variables.

The approach used in the process of formulating the empirical generalisations, as well as the hypotheses, is a straightforward one. It begins with a review of the relevant general literature. In the case of the empirical generalisations, this is limited to British studies which are more directly relevant. In the case of the hypotheses, other studies, particularly American ones, are cited where they are relevant to the issue under discussion. The second stage involves an examination of studies which focus specifically on Scotland and the regional patterns of variation within the Scottish Health Service. Because the particular conceptual framework used in this research has never been applied to such studies in Scotland, there will be few such references possible in the formulation of hypotheses. Finally, the evidence presented in earlier chapters will be referred to where it is appropriate. On this basis an explicit

formulation of the empirical generalisations and hypotheses will be derived.

Empirical Generalisations:

The introduction to this chapter indicates the three basic concerns of this section - regional variation in terms of our measures of health service policy, policy variation over time, and the nature of the policy process. In the first of these, policy has been viewed in two ways. Policy outputs are expenditures per 1,000 population. Policy outcomes reflect health care facilities and staffing levels per 10,000 population. Insofar as policy variation over time is concerned, two issues are paramount. Has there been any change in the extent of regional variation from 1951 to 1976? Are the regions which were relatively deprived in 1951 still deprived in 1976? With regard to the policy process, the major problem is to determine if the policy process may be categorised as incrementalist. Each of these issues is developed more fully below.

The policy model outlined previously provides for ten indicators of policy output and eleven indicators of policy outcome. These are: total costs per 1,000 population; hospital costs per 1,000 population; psychiatric beds' costs per 1,000 population; chronic beds' costs per 1,000 population; general beds' costs per 1,000 population; general practitioner costs per

1,000 population; dental costs per 1,000 population; pharmaceutical costs per 1,000 population; optical costs per 1,000 population; community health costs per 1,000 population; total beds per 10,000 population; psychiatric beds per 10,000 population; chronic beds per 10,000 population; general beds per 10,000 population; hospital doctors per 10,000 population; hospital nurses per 10,000 population; general practitioners per 10,000 population; dentists per 10,000 population; pharmaceutical chemists' outlets per 10,000 population; opticians per 10,000 population and community health staff per 10,000 population. By examining the available evidence regarding each of these policy variables, it should be possible to conclude by formulating emprical generalisations regarding the presence and/or extent of variation for each of them.

Total Beds:

In their study of the National Health Service, Professor and Mrs. Jewkes found some regional variation in the number of hospital beds per 1,000 population. The South-West Region averaged 14.6 hospital beds per 1,000 and the Sheffield Region's average was 8.6 beds per 1,000. Despite this difference, they concluded that " the distribution of hospital beds in relation to population is fairly uniform throughout the country ". [1]

More recent studies on this subject tend to contradict the conclusion reached by Professor and Mrs.

Jewkes. Using 1971-1972 data, Buxton and Klein discovered that the coefficient of variation for total hospital beds per population, classified by region, was 30.1. The average regional figures ranged from 74 percent below the national average at Sandwell to 74 percent above the national average at Subhull. [2]

Culyer and Cooper used 1967 statistics regarding the number of staffed beds per 1,000 population by region. They found a range of averages by Hospital Board Region of 7.64 beds per 1,000 to 13.77 beds per 1,000. The highest average was 182 percent greater than the lowest average. [3]

Coates and Rawston examined the regional variation in the number of beds per million population. They found that in 1963, the North-East Metropolitan Region contained 5,307.5 beds per million; whereas, Sheffield had only 3,620.7 beds per million population. [4]

In the case of Scotland, the Dewar, Cathcart and Hospital Survey Reports all indicated a large regional imbalance in the availability of hospital beds prior to the creation of the NHS. [5] Since 1946, the Committee of Inquiry into the Costs of the NHS and the 1961 to 1971 Annual Reports of the Home and Health Department demonstrate that this regional imbalance in the number of total beds continued to be a feature of the Scottish Health Service. [6]

This evidence suggests that there is considerable variation in the number of total hospital beds per 1,000 population for the Health Board Regions in Scotland.

Psychiatric Beds:

Three studies of the availability of psychiatric beds by region indicated major variations in this aspect of the National Health Service in England and Wales. Maynard found that in 1967 Sheffield contained 3.153 psychiatric hospital beds per 1,000 population and that the South-West Metropolitan Region averaged 7.796 psychiatric beds per 1,000. [7] In a later study, Maynard and Tingle calculated the coefficients of variation for the number of mental illness and mental handicap beds for 1962 and 1970 by region. In 1962 the coefficient of variation for mental illness beds was 34.57. By 1970 this figure had been reduced slightly to 30.73. For mental handicap beds the 1962 and 1970 statistics were 33.89 and 28.13, respectively. [8]

Using 1971-1972 data, Buxton and Klein examined this situation more intensively for eight regions in England. They found that V was 94.9 for mental handicap beds per population and that V was 69.5 for mental illness beds. Croyden had 331 percent more mental handicap beds than the average and St. Helens and Knowsley had 100 percent fewer beds than the average.

Kingston and Richmond contained 170 percent more and Rotherham 100 percent less mental illness beds per population than the average. [9]

In Scotland the situation is even more stark. To some extent, this results from the development of the mental health laws and facilities in the nineteenth century which established a basic organisation for psychiatric care. For example, the 1857 Lunacy (Scotland) Act established eight district boards which were required to find sufficient accomodation within their territories to meet the district demand for mental health care. This posed a very serious problem, since, at the time, there were only seven public asylums (Royal or Chartered) in Scotland. Obviously, in at least one district, there was no public accomodation of any kind to assist the district board in carrying out its responsibilities.

The 1862 Lunacy (Scotland) Act came to grips with this issue. It allowed the district boards which could not find sufficient accomodation within their territory to contract for facilities outside their districts. This feature remained a salient aspect of the organisation of the Scottish Health Services to the present day. By 1976 there were two Health Board Regions in which no psychiatric beds were available.

This evidence suggests that there is considerable variation in the number of psychiatric beds per 10,000 population for Health Board Regions in Scotland.

Chronic Beds:

A number of studies demonstrated the serious regional inequalities which exist insofar as the provision of chronic beds is concerned. M. H. Cooper found that in 1961 the North-West Metropolitan Region contained only 60 percent of the national average of chronic beds per capita; whereas, Leeds had 139 percent of the national average. By 1970 the North-West Metropolitan Region's average had risen to 78 percent of the national average while that of Leeds had declined to 129 percent. [10]

Buxton and Klein's study showed a similar discrepancy. For 1971-1972, V for the eight regions examined was 32.0. North Yorkshre had 66 percent more chronic beds per capita than the average, but St. Helens and Knowsby had 60 percent fewer chronic beds per capita than the average. [11]

Griffiths investigated the regional variations in the number of geriatric and chronic beds per 1,000 population over 65 years of age. He determined that the Metropolitan Regions' average was slightly over 8; whereas, the average for Manchester was in excess of 10. [12]

The consumer magazine, Which, examined the number of geriatric beds occupied daily per 1,000 population over 65 years of age by region. It discovered a range of 11 beds per 1,000 in Leeds to 7 beds per 1,000 in the North-West Metropolitan Region. [13]

The 1957 Annual Report of the Department of Health for Scotland indicated the existence of similar patterns of variation in Scotland. [14] The failure of the Northern Region to obtain the services of even one whole-time geriatrician until 1971, despite the disproportionate number of people over the age of 65 in the area, suggests that this pattern continued into the 1970's. [15]

The evidence suggests that there is considerable variation in the provision of chronic beds per 10,000 population for Health Board Regions in Scotland.

General Beds:

The situation with regard to general beds' provision by region appeared to be similar to those outlined above. Which magazine found that Liverpool had twice as many acute beds per population as Sheffield or Oxford. [16] In 1968 Griffiths discovered that Sheffield had approximately 2.5 acute beds per 1,000 population while Liverpool enjoyed approximately 4.5 acute beds per 1,000 population during the same period. [17]

Buxton and Klein distinguished between general

medicine and general surgery beds. In the case of the former category, they found that for 1971-1972 Liverpool had 192 percent more beds per population while Derbyshire and Leicestershire possessed 63 percent fewer beds per population than the average. In the case of general surgery beds, Liverpool had 130 percent of the average and Sandwell 51 percent less than the average. [18]

In the case of Scotland, the evidence presented by the 1971 Annual Report of the Home and Health Department indicated great discrepancies in the range of treatment facilities providing general beds in the country. [19] This evidence was reinforced by statistics provided by the 1975 Scottish Health Statistics. [20]

The data suggest that there is considerable variation in the provision of general beds per 10,000 population for Health Board Regions in Scotland.

Hospital Doctors:

Cooper and Culyer concluded that " despite a growing number of consultants, the increases in manpower do not appear to have been used systematically to erase regional inequality to achieve territorial justice ". [21] Their research indicated that despite a 22 percent increase in the number of consultants between 1962 and 1966, the coefficient of variation for the number of consultant per population by region

increased from 15 to 17 during the period. [22]

The Maynard study found that V for the number of psychologists working in mental illness hospitals per population by region for 1969 was 47. The corresponding figure for consultants in psychiatry working in mental handicap hospitals during the same year was 36. [23]

In another study, Cooper and Culyer examined the regional variations in the population per whole-time-equivalent consultant and the population per hospital doctor at the rank of medical assistant and below. They found that for the first category in 1966, the most favoured area's average was 4,425 and the most unfavoured area's average was 8,932. The figure for the most favoured area was 202 percent of the average for the most unfavoured area. For the second category in 1966, the gap was even worse. The most favoured area's average of 6,140 was 269 percent greater than that of the most unfavoured area's average of 2,283. [24]

Which investigated the number of psychiatric consultants and psychologists per 1,000 hospital patients in 1961. It discovered a range of variation from a low of 0.55 in the South-West Region to 1.35 for the Oxford Region. [25]

In Scotland, the Hospitals Survey [26], the Wright Report [27], the Birsay Report [28] and the 1971

Annual Report of the Home and Health Department [29] and the 1975 Scottish Health Statistics [30] all confirm the regional pattern involved in the distribution of hospital doctors.

This evidence suggests that there is considerable variation in the provision of hospital doctors per 10,000 population for Health Board Regions in Scotland.

Hospital Nurses:

There are relatively few studies of the regional variations in the per capita rates of nursing staff. Which found that Liverpool had 30 percent more nurses per population than Sheffield. [31] Griffiths discovered that in 1968 East Anglia had 20 percent fewer nurses per population than the national average, while Liverpool had 18 percent more nurses per population than the national average. [32] Cooper found that in 1971-1972 Sheffield had only 70 percent of the nurses per capita of the Liverpool area. He also noted that the ratio of nurses in mental illness hospitals per 100 patients ranged from 22.5 to 70.9. [33]

The Annual Reports of the Department of Health for Scotland repeatedly pointed out the shortage of nursing staff and indicated that in some areas beds were not occupied because of the lack of qualified nurses. [34] In discussions with Scottish Home and Health Department officials we were told that there

was a shortage of qualified nurses in Scotland in the 1970's. Those officials also indicated that a few areas, particularly the Western Isles, seemed to be able to attract and maintain a sufficient complement of nurses to meet their nursing manpower needs. This, however, was not the case for most areas of the country.

This evidence suggests that there is considerable variation in the provision of hospital nurses per 10,000 population for Health Board Regions in Scotland.

General Practitioners:

Staffing studies regarding the regional distribution of general practitioners provided data as far back as 1951. [35] Professor amd Mrs. Jewkes found that for 1951, 1954 and 1959, the coefficient of variation of the number of general practitioners per population by county were 81, 53.9 and 51.5, respectively.[36]

Last's study of the regional distribution of general practitioners and consultants concluded that medical schools tend to supply general practitioners to adjacent rather than to remote regions. [37] It is important to note that his data included Scottish as well as English and Welsh material.

The major study by Butler, Bevan and Taylor found that if one examined the number of principals in England for 1970, one would find that the South-

East Region had a surplus of 217, while the West Midlands had a shortfall of 87. [38]

Which found considerable variation in the average list sizes of general practitioners by region in 1974. The average list size in Sheffield was 2,527, but it was only 2,170 in the South-Western Region. [39]

Cooper and Culyer examined the population per general practitioner (principals) by region for 1966 and found a coefficient of variation of 20.93. The most favoured area had 1,593 people per principal; whereas, the least favoured area had an average of 3,685 people per principal. [40]

The most useful study provided Scottish data on this subject. Coates and Rawston examined the average list size per general practitioner (principals) by Executive Council area for 1966-1967. In Lanark, the average list contained 2,470 patients. In Sutherland, the average was 956. They also investigated the number of general practitioners per 100,000 patients by Executive Council area. The range was from 40.48 in Lanark to 104.60 in Sutherland. [41]

In a previous chapter a variety of information sources were presented. These included material regarding list sizes, listed areas, initial practice allowances and inducement payments. [42] That material

supported the conclusions reached by Coates and Rawston.

This evidence suggests that there is considerable variation in the provision of general practitioners per 10,000 population for Health Board Regions in Scotland.

Dentists:

In the cases of the distribution of dentists there are both English and Welsh and Scottish data-based studies available. For England and Wales, Professor and Mrs. Jewkes found that the coefficient of variation for dentists per population by county was 44 in 1949 and 62.5 in 1958. [43]

The Cook and Walker study has been the most extensive examination of the regional distribution of dentists. Their English and Welsh data was obtained for 1961; the Scottish data was available for 1963. In the case of England and Wales, they found considerable variation in the number of dentists per 10,000 population. Chester averaged 5.93 dentists per 10,000 population, but Norfolk had only 0.98 dentists per 10,000. For Scotland, Shetland had 3.42 dentists per 10,000 as compared to the Scottish average of 2.33. [44] Cook and Walker concluded that " in Scotland most of the districts with relatively few dentists lie in the South between the border and the Forth-Clyde estuaries ". [45]

Coates and Rawston provided some additional evidence regarding the regional variation in the number of dentists. They found that 17 counties in Scotland had under 2,000 school children per school dentist and that 2 Scottish counties had over 8,000 school children per school dentist. [46]

The Annual Reports of the Scottish Home and Health Department provided three types of evidence. These were data regarding school dental services, list sizes of dental practitioners in various counties and information about parts of the country in which no qualified dental practitioner was available. [47]

This evidence suggests that there is considerable variation in the provision of dentists per 10,000 population for Health Board Regions in Scotland.

Pharmacists' Outlets:

There appears to be no published studies regarding the regional distribution of pharmaceutical chemists in contract with the National Health Service in Scotland or for other parts of the United Kingdom. Fortunately, the Annual Reports of the Department of Health for Scotland did provide evidence regarding the number and location of dispensing doctors. These doctors were authorised to dispense drugs in areas of Scotland where residents did not have reasonable access to a pharmacists. The trend established was

one in which, even in the 1970's, dispensing doctors were still necessary. [48]

The evidence suggests that there is considerable variation in the provision of pharmacists'outlets per 10,000 population for Health Board Regions in Scotland.

Opticians:

As was the case for pharmacists, there appeared to be no published analyses of the regional distribution of opticians in contract with the National Health Service for Great Britain. The evidence presented by the Department of Health for Scotland was less extensive than that for pharmaceutical chemists. Basically, the Annual Reports demonstrated regional variation in both the availability and comprehensiveness of vision testing for school children and through local authority health services. [49]

Although the evidence is limited, it does suggest that there is variation in the provision of opticians per 10,000 population for Health Board Regions in Scotland.

Community Health Staff:

Although there were relatively few studies of the geographic distribution of community health service staff, there were a few references which touched upon the subject. Parker found that in the

local authority health field the " variation in the provision made by different local authorities meant that some areas were very badly served ". [50]

The Report of the Committee on Local Authority and Allied Personal Social Services provided more specific data on this subject. The Committee found that although the average number of health visitors per 1,000 population was 0.120, the range extended from 0.024 to 0.216. [51] In the case of home nurses, the average was 0.180 home nurses per 1,000 population, but the range was from 0.072 to 0.360. [52]

The Annual Reports of the Department of Health for Scotland and its successor indicated two things. First, there were major differences in the types of services provided by the local authorities in Scotland. The second feature indicated that some areas, particularly the rural ones, had great difficulty in attracting the necessary numbers of qualified staff during the period. [53]

This evidence suggests that there is considerable variation in the provision of community health staff per 10,000 population for Health Board Regions in Scotland.

Policy Outputs:

A careful examination of the studies of expenditure variation in the National Health Service

revealed that there were far fewer of them than was the case for policy outcomes. As a result, the procedure used to facilitate the development of empirical generalisations was altered slightly.

As was the case for the previous section, an effort was made to uncover analyses of expenditure variation which dealt with the various elements of the NHS in Britain. This evidence was supplemented by studies which focussed attention on the situation in Scotland. In cases where this type of secondary source material was unavailable, recourse was made to the patterns of policy outcomes described above. The decision to refer to policy outcome evidence, when necessary, was based on discussions with a senior official of a Scottish Health Board. He pointed out that " there is little doubt in the minds of Health Board Treasurers generally that regional variations in the pattern of the service have been caused very largely by the system of distributing resources ". [54] The same official went on to note that this conclusion " is now acknowledged by the Scottish Home and Health Department ". [55] On this basis, it seemed to be appropriate to conclude, where no more direct evidence was available, that regional differences in policy outcomes reflected regional differences in policy outputs.

Total Costs:

It seemed that there had been few studies of the total expenditures of Health Boards which concerned themselves with regional variation. Which found that in 1971, health service spending per capita ranged from a low of £30.47 in Sheffield to a high of £48.06 in the South-West Metropolitan Region. [56]

The Interim Report of the Working Party on Revenue Resource Allocation which was published by the Scottish Home and Health Department in 1976, claimed that there had been " no conscious effort to effect redistribution of funds as between Regional Hospital Boards " [57], during the 1950's and the early 1960's. In later years, revised revenue allocation systems were ineffective in redistributing revenues because they distributed the " overwhelming proportion of funds available on the same pattern as the previous year ". [58] The recommendations of the SHARE Report attempted to alter this old system to achieve more equitable revenue allocations between regions, but their recommended system had not gone into effect by 1976.

This evidence suggests that there is considerable variation in the total expenditures of Health Board Regions per 1,000 population in Scotland.

Hospital Costs:

There are several studies of regional variation

in hospital expenditures. Cooper found that in 1950-1951, the expenditure per capita on hospitals was 71 percent of the national average; whereas, in the South-West Metropolitan Region and Wessex, hospital spending was 143 percent of the national average. By 1971-1972, the figures had changed, but the pattern remained the same. Sheffield's hospital spending per capita was 84 percent of the national average; the South-West Metropolitan Region and Wessex's hospital spending was 112 percent of the national average. [59] The Jewkes' study indicated that " in 1951 the 'poorest' region showed expenditure per head about two thirds that of the 'richest' ". [60] Buxton and Klein found that in 1971-1972, Sandwell's hospital expenditures were 69 percent below the national average; whereas, Liverpool's were 62 percent above the national average. [61] Cooper and Culyer found that in 1967 the most unfavoured region spent £7.22 per capita on hospitals while the most favoured region spent £10.20 per capita. [62]

In the case of Scotland, the Interim Report of the Working Party on Revenue Resource Allocation argued that the " allocation predominantly reflects the location and number of existing hospital beds ". [63] Since the material presented earlier indicates an uneven distribution of hospital beds, it would appear

to be logical to conclude that there is considerable variation in the hospital expenditures of Health Board Regions per 1,000 population in Scotland.

Psychiatric Beds' Costs:

Only one study seemed to have examined regional variation in the expenditures on psychiatric beds. Culyer and Cooper studied the expenditure on psychiatric hospitals (mental illness and mental subnormality) per capita. They discovered that the spending ranged from £1.7 per capita in the most unfavoured region to £4.7 in the most favoured region. The difference was that the greater per capita expenditure was 278 percent of the smaller sum. [64]

The general pattern of expenditures in Scotland on psychiatric beds is relatively straightforward. We know that even as late as 1976 some Health Board Regions contained no psychiatric beds. Clearly, they would have no expenditures of this type; whereas, the other Health Boards would face psychiatric beds' costs.

This argument suggests that there is considerable variation in the psychiatric beds' expenditures of Health Board Regions per 1,000 population in Scotland.

Chronic Beds' Costs:

In the case of expenditures for chronic beds there seemed to be no secondary sources which dealt

with the issue of regional differences in Britain. We do know, however, that there were regional differences in the availability of chronic beds in Scotland during the 1951-1976 period. [65]

On that basis, following the procedure described above, we suggest that there is variation in the chronic beds' expenditures of Health Board Regions per 1,000 population in Scotland.

General Beds' Costs:

There seemed to be only one study of the regional differences in expenditures on general beds. Coates and Rawston found that the average cost per inpatient week in acute hospitals varied from £32 8s in Liverpool to £44 9s in Oxford in 1966. [66]

In Scotland a variety of suggestive indicators were available for consultation. The Interim Report of the Working Party on Revenue Resource Allocation pointed out that the system used in 1976 gave " overdue weight to the hospital services and - because these are the heaviest spenders - to acute beds in those services ". [67] The SHARE Report demonstrated the additional expenditures of teaching hospitals which concentrate primarily upon the provision of what we have defined as general beds. [68] Since relatively few areas have teaching hospitals, and because of the regional variation in the availability of general

beds in Scotland, it seemed to be logical to conclude that there is considerable variation in general beds' expenditures of Health Board Regions per 1,000 population in Scotland.

General Practitioner Costs:

The evidence regarding regional variation in expenditures for general practitioner services is quite limited. Noyce, Snaith and Trickey found that for 1971-1972, the expenditures of Executive Councils per 1,000 varied from £10,800 in the North-West Metropolitan Region to £8,952 in Sheffield.[69]

In the case of Scotland, we do know that there is extensive regional variation in terms of list sizes per general practitioner and in terms of the number of general practitioners per 10,000 patients.[70] For these reasons, it appears that there is considerable variation in general practitioner expenditures by Health Board Regions per 1,000 population in Scotland.

Dental Costs:

In the case of dental expenditures, the excellent study by Walker et al., provided a great deal of detailed information. For 1962 they found that the average expenditure per capita ranged from 18 shillings or less in the Midlands and Wales to 30 shillings or more in the Metropolitan Region. In terms of gross payment per dentist, Walker discovered that the range was from £4,100 in Wales to over £5,300 in

the Midlands.

Fortunately, this study also provided the same type of information for Scotland. In 1962, the average per capita expenditure on dental care in Edinburgh, Glasgow and Dundee ranged from 21 to 24 shillings. For the rest of Scotland, the average expenditures ranged from 15 to 18 shillings. In Edinburgh, Glasgow and Dundee, the average gross payment per dentists was between £4,100 and £4,400 in 1962. For the rest of the country, the average ranged from £4,400 to £4,700. [71]

It appears that on the basis of this evidence and that cited in Chapter II [72], there is considerable variation in the dental expenditures of Health Board Regions per 1,000 population in Scotland.

Pharmaceutical Costs:

There did not seem to be any systematic studies published which treated regional variations in pharmaceutical expenditures. The 1971-1972 study by Noyce, Snaith and Trickey demonstrated that there was considerable variation in Executive Council expenditures per capita in England [73]; however, the data was too gross to be considered as anything more than suggestive.

In the case of Scotland, there were two sets of information from which an empirical generalisation may be derived. The review provided in Chapter II

pointed out that there was a great deal of regional variation in the distribution of pharacists' outlets.[74] In addition, the same section of the dissertation also pointed out the concern of the Scottish Home and Health Department regarding the regional differences in prescription costs and prescribing practices in the country.[75]

The evidence suggests that there is considerable regional variation in the pharmaceutical expenditures of Health Boards per 1,000 population in Scotland.

Optical Costs:

There appeared to be no systematic study of regional variation in opticians' expenditures for England and Wales and for Scotland. In the latter case, the evidence cited above[76] indicated that there was variation in the regional distribution of opticians.

On this basis, it might be suggested that there is variation in the optical expenditures of Health Board Regions per 1,000 population in Scotland.

Community Health Expenditures:

Noyce, Snaith and Trickey presented more compelling evidence with regard to community health expenditures. For 1971-1972 they found that local authority health service expenditures ranged from £2,907 in East Anglia to £3,918 per 1,000 population in the South-West Metropolitan Region. During the same period, they found that community health expenditures

per 1,000 ranged from £12,029 in Sheffield to £14,555 in the North-West Metropolitan region. [77]

In the case of Scotland, the evidence presented in Chapter II and cited above [78] indicated a clear pattern of regional differences in terms of both the scope and depth of community health services.

On this basis we conclude that there is considerable variation in the community health expenditures of Health Board Regions per 1,000 population in Scotland.

Patterns of Policy Variation:

In this section of the chapter we are concerned about the formulation of empirical generalisations regarding two particular patterns of policy variation between regions in Scotland. The first of these relates to the relative rankings of the Health Board Regions during the period. The second concern is with changes in the extent of variation from 1951 to 1976. The same approach as is used above is applied in order that we may derive the appropriate conclusions from the evidence presented.

Relative Ranking of Health Board Regions:

In his Need and the National Health Service, Culyer referred to the 1970 Cooper and Culyer study in which 31 indices of provision were constructed from official sources. In almost every instance, Sheffield

was " worse-off " than Oxford. [79]

In his study of psychiatric care in England and Wales, Maynard concluded about mental illness hospitals " that there are substantial inequalities and that there is no evidence to show that regions that are better off in one sphere are compensated by better endowments in other spheres ". [80] He arrived at the same conclusion regarding hospitals for the mentally handicapped.

Cooper offered the same type of conclusion in his book. He argued that " no evidence of one variable compensating for a deficiency in another could be found. The areas relatively deprived on one yardstick were relatively deprived on another ". [81] Culyer and Cooper came to the same conclusion on the basis of their 1970 research project. [82]

In the case of the NHS in Scotland, studies of this type are unavailable. The evidence presented in Chapter II, however, does suggest that at least for a number of aspects of the Health Service, certain areas are relatively worse off. These areas tend to be rural, remote ones and the Highlands and Islands are frequently described in this fashion by official reports. Clearly, the information presented to date seems to indicate that in terms of hospital provision, specialist services, pharmaceutical outlets, the distribution of dentists and the availability of

certain types of community health staff, the Highlands and Islands do not compare favourably with the regions to the south.

This evidence does suggest a pattern in Scotland in which those Health Board Regions which are relatively deprived in one aspect of health care provision, are similarly deprived in all spheres of health care provision.

The Extent of Variation over Time:

Logan has argued that " the irregular pattern of provision across the country has scarcely changed over the past century ". [83] Griffiths has studied the expenditure of hospital regions per population. He concluded that " over twenty-one years later, the relative positions of the regions has not changed appreciably, though one of the main aims in introducing the NHS was to secure equal access to medical care for every individual across the country ". [84]

Culyer has pointed out that recent studies confirm " the general impression that earlier data have given about the Sheffield region ". [85] Culyer and Cooper found that in the period since 1962 " we have not been able to find much evidence that inequalities have been decreasing ". [86] The research done by Professor and Mrs. Jewkes indicated that " in 1959 more than one half of the people of England and

Wales were on general practitioners' lists of more than 2,500 and 29 percent were on lists of more than 3,000. Distribution of this kind has certainly not improved since 1954 ". [87]

Cooper found that regional inequalities appeared to have increased during the 1962-1967 period. [88] He concluded that " the inception of the NHS in 1948 did not bring in its wake any sweeping changes. In fact, the initial allocation of resources in 1948 reflected the pre-NHS imbalance. Subsequent distribution of manpower and finance have preserved them largely intact ". [89]

In the case of Scotland, there are no studies of this type which deal directly with the issue of regional variation over time. Chapter II provides considerable information which bears indirectly on this issue. The Chapter establishes that there were major differences in the policy outputs and outcomes in the NHS of various Health Board Regions during the early years of the Service. [90] It also indicates that, for a number of spheres of the Service in the 1970's, these differences remained. [91] The work of the SHARE Report Committee reflects pressures in the 1970's to remove inequalities in resource allocation between regions.

On this basis, it appears that there has been

no major reduction in regional inequalities in the Scottish Health Service from 1951 - 1976.

The Nature of the Policy Process:

There are a number of studies which touch directly on this topic. Klein indicates that incrementalism can be viewed as a policy-making model which characterises much of the policy-making which is done in the NHS in Britain. [92] Wiseman [93] and Brotherston [94] suggest that the predominant policy process of the Scottish Home and Health Department very closely approximates the incrementalist model. David Hunter's recent examination of Health Board policy-making in Scotland explicity describes the process as disjointed incrementalism. [95]

On this basis, it seems reasonable to suggest that incrementalism is the model which best describes the policy-making process used to arrive at policy decisions by Health Boards in Scotland.

Hypotheses:

In Chapter III a policy model which provided a basis for the explanation of policy variation was developed. It introduced three groups of independent variables. The socio-economic factors included income, industrialisation, urbanisation and region. The health status variables were crude death rates, standardised mortality rates and infant mortality rates. The government

structure variables were the number of teaching hospitals, the total number of Health Board staff, the influence of senior levels of government and the nature of the policy process. It was expected that these independent variables, either individually or combined, would explain a large amount of the policy variation. The policy model also distinguished between policy outputs (expenditures) and policy outcomes (facilities and staff). In addition, Chapter III clearly indicated that there was likely to be interaction and inter-relationships between the independent variables. These three aspects of the model seemed to suggest appropriate bases from which hypotheses could be derived.

Policy Outputs and Policy Outcomes:

Both Davies' and Newton and Sharpe's research have expressed reservations about using expenditures as the sole indicator of policy. These British scholars felt that the level of expenditure did not necessarily indicate the quality of the service or the quantity of the service in question. [96] This issue has been examined most thoroughly by Sharkansky.

In his first study, he developed ten indicators of health policy which included such variables as dentists per 100,000 population and hospital beds per 10,000 population. There were three expenditure

measures - combined state and local expenditures per capita, combined state and local government expenditure per $1,000 of personal income, and combined state and local government expenditures for each major function as a percentage of total general expenditures.

Of thirty simple correlations between services and expenditures, only five were significant - two with spending measure one and three with spending measure three. When partial correlation techniques controlling for such factors as per capita income and the number of government employees per 10,000 population were applied, there was no statistically significant relationship between expenditures and services.[97]

In Spending in the American States, Sharkansky used a larger data base and extended the analysis further. Using the same simple correlation procedures he found only five relationships to be significant. Of these, two were negatively related. He went on to examine the relationship between services and expenditure change over time. Using six health service indicators and the three spending measures, he found ten significant positive correlations out of eighteen possibilities. He concluded that " gross level of spending does not reflect service levels and that gross increases in spending are not likely to produce early gross

improvements in services ".[98]

The reservations of the British scholars and the results of Sharkansky's work suggest that, in the case of the National Health Service in Scotland, there is no strong positive relationship between policy outputs and policy outcomes.

Socio-Economic and Health Status Variable Interaction:

Anderson, Rice and Tyroler's research studies in the U. S. have all indicated that there are strong links between income, urbanisation and industrialisation and mortality rates.[99] In Britain, the work of people like Tudor Hart and Nicki Hart have demonstrated that region, as well as income, industrialisation and urbanisation, are strongly linked to mortality.[100]

McIllwaine's recent detailed examination of this issue in Glasgow came to a similar conclusion.[101] Brotherston has supplemented McIllwaine's research with other data in an effort to demonstrate that some policy changes should be considered.[102]

This evidence suggests that in Scotland there is a strong relationship between income, urbanisation, industrialisation and region with infant mortality rates, crude mortality rates and standardised mortality rates.

Socio-Economic and Policy Variables Relationships:

Dawson and Robinson's pioneering study

examined the rank order correlations between income, urbanisation and industrialisation with public welfare policies. They found significant correlations between socio-economic variables and public welfare variables. " The highest correlations were found between per capita income and policy. " [103] The conclusion was that " the level of public social welfare programs in American states seems to be more a function of socio-economic factors, especially per capita income ". [104]

Sharkansky examined the relationship between per capita income and health and hospital expenditures of U. S. states in 1962. The simple correlations between the two sets of variables were statistically significant. [105]

Richard Hofferbert examined the nature of the relationship between income per capita, urbanisation and industrialisation with spending on health and hospitals by state and local governments in the U. S. in 1963. The correlations for all three relationships between socio-economic factors and expenditures were statistically significant. Income had the strongest relationship with health and hospital expenditures. [106]

Dye developed seven indicators of health services in his study. He used four socio-economic indicators - urbanisation, industrialisation, income and education. The first three socio-economic variables

were correlated significantly with the number of physicians per population and the population percentage with health insurance. Industrialisation had the strongest relationship with health service indicators.[107]

In Spending in the American States, Sharkansky analysed the relationship between state health and hospital expenditures and income per capita, urbanisation and industrialisation. He found that in all cases, the relationships were statistically significant.[108]

In his review of the literature, Hofferbert has commented on this subject.

> The most controversial finding of the comparative state and local policy studies has been the repeated demonstration that nearly all the effects on policy that had often been attributed to variation in the political context - for example, apportionment or party - are in fact caused by differences in the socio-economic context.[109]

Bleddyn Davies, Alford and Boaden, Boaden, and Peters come to similar conclusions. Boaden, for example, finds that health spending in English local authorities is related to social class and urbanisation.[110] Noyce, Snaith and Trickey find that community health expenditures appear to be related to the social class composition of the population of the area.[111]

The relationship between region and public policy has been studied by Sharkansky in three different projects. In one he used Elazar's data regarding political

culture in the U.S. to develop regional political culture indices. He presented two regional categories. The first had four sub-groupings; the second had eight regional groups. The statistical correlations between policy outputs and regional political culture when controlling for income and urbanisation were statistically significant. [112]

In his second study Sharkansky used three classifications of region. The first two were the same as those of the initial study. The third was based upon regions identified by the U. S. Census. In the conduct of the study the author noted that " much of the economic-policy relationship that does exist depends on interstate differences in per capita personal income ". [113] By using analysis of covariance techniques Sharkansky was able to examine the relationship between region and policy outputs. He concluded that region made a substantial contribution to the explanation of public policies. " In all but eight of the dependent variables (42) region shows a significant independent relationship with policy while controlling for economics. " [114] By using more extensive data bases, Sharkansky was able to confirm these conclusions in a later study. [115]

In the case of Scotland, the regional factor in the provision of health services had been recognised

for a considerable period of time. The 1913 Highlands and Islands (Medical Service) Grant Act established a distinctive pattern of service which lasted for over fifty years. [116] The Birsay Report re-emphasised the regional character of the health services in the Highlands and Islands in the 1960's. [117] The SHARE Report indicated a need to re-allocate revenues to areas such as the Western Isles.[118]

On the basis of this brief review of some of the available evidence, a number of hypotheses seem to be appropriate. In Scotland there is a strong statistical relationship between income and the policy outputs and outcomes of the Health Boards. In Scotland, there is a strong relationship between urbanisation and the policy outputs and outcomes of the Health Boards. In Scotland, there is a strong statistical relationship between industrialisation and the policy outputs and outcomes of the Health Boards. In Scotland, there is a strong statistical relationship between region and the policy outputs and outcomes of the Health Boards.

Health Status and Policy Variables Relationships:

The possible relationship between health status factors as indicators of need and policy outputs and outcomes has been developed previously. In Britain, Bleddyn Davies, Boaden and Alford, and Boaden's studies have all indicated that the policy-making system can

respond to needs which are evident in the policy environment. Peters' suggestions regarding explicit policy changes in response to changes in mortality rates are even more direct. [119]

In Scotland, there is both indirect and direct evidence which shows that policy-makers are concerned with mortality rates and that some effort is made to respond to them. [120] Concern regarding infant mortality rates in Scotland has been expressed many times in the past by officials of the Home and Health Department. [121] The SHARE Report argued that standardised mortality rates are the best indicators of need which are currently available and used them in proposing changes in the allocation of revenues to Health Boards. [122] An argument regarding the use of crude death rates has been presented by Jones and Bourne in their study of England and Wales.[123]

On the basis of the evidence cited above, three hypotheses would seem to be appropriate. In Scotland, there is a strong statistical relationship between infant mortality rates and the policy outputs and outcomes of the Health Boards. In Scotland, there is a strong statistical relationship between standardised mortality rates and the policy outputs and outcomes of the Health Boards. In Scotland, there is a strong statistical relationship between crude death rates

and the policy outputs and outcomes of the Health Boards.

Government Structure and Policy Variables Relationships:

Sharkansky's work has been the most thorough analysis which demonstrates that, contrary to most policy output studies, political characteristics (government structure variables) do have major effects upon policy. His conclusions have been reinforced by a number of British studies.

In his first analysis, Sharkansky examined the relationship between government characteristics such as previous expenditures, federal involvement, state employees per 10,000 population and public policy outputs. He found that the statistical relationships between the two sets of variables were significant. He concluded that " measures pertaining to previous spending, federal aid...state employees...show strong simple relationships with the current spending of American state governments." [124]

In Spending in the American States, Sharkansky extended his analysis further. He found the same significant relationship between his two sets of variables as had been the case before. Even when controls for socio-economic variables such as income per capita were introduced, government structure variables remained correlated significantly with public policy outputs. [125]

Brotherston's, Wiseman's and Hunter's research all indicated that previous expenditures had a major impact upon current policy outputs. [126] The SHARE Report provided recent evidence of the importance and additional cost of teaching hospitals within the Scottish Health Service.[127] Rose, Klein, Peters and Boaden have all indicated that the size of the appropriate bureaucracies can have considerable impact upon the policy decisions made. [128]

On the basis of this evidence, three hypotheses seem to follow logically. In Scotland, there is a strong relationship between the nature of the policy process and the policy outputs and outcomes of Health Boards. In Scotland, there is a strong statistical relationship between the number of teaching hospitals per Health Board Region and the policy outputs and outcomes of Health Boards. In Scotland, there is a strong statistical relationship between the total number of staff of Health Boards and the policy outputs and outcomes of Health Boards.

It should be noted at this stage that no explicit hypothesis regarding the relationship between the influence of senior levels of government and policy has been formulated. Klein's arguments, in particular, provide a basis from which such an hypothesis could be formulated. [129] Sharkansky, however, adopts a different research strategy, in which he

turns to this factor first in an effort to explain policy variation which has not been adequately dealt with by the other independent variables. [130] By using this latter approach, I hope to refer to the influence of senior levels of government only when it seems appropriate to do so, rather than treating the variable as a generally applicable explanatory factor. For this reason, no explicit hypothesis is presented.

The Most Powerful Explanatory Variables:

In assessing which of the independent variables is likely to be the most powerful explanatory variable, the vast majority of the available research comes from the U. S. The studies of Dye, Robinson and Dawson, and Hofferbert all indicate that socio-economic factors are the more powerful explanatory tools when dealing with variation in policy outputs and outcomes. Sharkansky's work, on the other hand, provides results which directly contradict such a conclusion. By applying regression analysis and including both socio-economic as well as government structure and other variables, he demonstrates that the three most powerful indicators of policy outputs are government structure characteristics.

In the case of individual variables, the work of Dawson and Robinson, Hofferbert, and to a lesser extent, Sharkansky, has indicated that in terms of

health policy, income is the most powerful explanatory factor among the socio-economic variables. Sharkansky's major analysis, however, points out that the nature of the policy process is the most important of the government structure variables.

Of all the studies mentioned, only Sharkansky's included both the socio-economic status and government structure variables. By applying partial correlation, regression analysis and multiple-partial correlation techniques, he was able to demonstrate that the policy process remained the single most powerful explanatory variable and that government structure variables explained more of the variation in policy outputs and outcomes than did the socio-economic variables.

On the basis of this evidence, two hypotheses seem to be appropriate. In Scotland, government structure variables explain more of the policy variation between Health Board Regions. In Scotland, the policy process is the most powerful explanatory variable when applied to an analysis of policy variation between Health Board Regions.

A word of caution is also appropriate at this stage. No mention has been made of the health status variables in this context. The reason for this is that there are no policy output studies of this type, to my knowledge, which analyse and

compare the explanatory power of the three sets of independent variables used in this study when treating the subject of policy variation. It is conceivable, therefore, that health status factors may play a more important role in explaining policy variation in the NHS in Scotland than the preceeding few paragraphs have suggested.

Conclusion:

This chapter had two basic goals. The first was to provide empirical generalisations about the nature and extent of policy variation between Health Board Regions in Scotland from 1951 - 1976. The second was to provide hypotheses regarding the relationship between the independent variables and the policy outputs and outcomes.

The evidence cited suggested that there is considerable variation for each of the twenty-one indicators of policy. It also indicated that there has been little if any reduction in the extent of policy variation during the period. In addition, the material referred to supported the notion that there has been no major change in the relative positions of Health Board Regions in terms of expenditure and the provision of staff and facilities over time. It appears that the independent variables are likely to be inter-related especially in the case of socio-

economic and health status variables. It is expected that all of the independent variables are related to policy outputs and outcomes and that government structure variables, particularly the policy process, are the most powerful factors explaining a large part of the policy variation.

In the few cases where other studies did not provide sufficient information to allow for the formulation of generalisations and/or hypotheses, this has been noted. If the results of the analysis indicate a need to discuss such factors, as might be the case with the influence of senior levels of government and the relative explanatory power of health status variables, this will be presented at the proper place.

Chapter VI

Policy Variation: A Description of Policy Outputs and Policy Outcomes in the SHS

Introduction:

This chapter provides a description and preliminary analysis of the nature and extent of the variation in the policy outputs and policy outcomes of the Scottish Health Service from 1951 - 1976. Policy outputs are measured in this study by expenditure variables. Policy outcomes are measured by health service staffing and facilities variables.

This examination of the policy variables should allow us to come to some conclusions regarding the majority or the empirical generalisations. Because the analysis required to determine the nature of the policy-making process is rather more sophisticated and because this chapter focusses on the dependent variables, it seemed to be more appropriate to deal with that issue in a subsequent chapter.

In this chapter, the relevant data takes two forms. The tables presented indicate the rank of each Health Board for each policy output and policy outcome variable at each interval. In addition, the tables also provide the appropriate coefficient of variation

for each variable at each interval. This information should be sufficient to allow us to reach conclusions regarding the validity of most of the empirical generalisations presented in a previous chapter.

Table VI - 1

Hospital Expenditures/1,000 - Rank Order

Health Board	Year			
	1951	1961	1971	1976
Argyll and Clyde	11	8	8	8
Ayrshire and Arran	9	11	15	14
Borders	10	10	11	9
Dumfries and Galloway	5	5	7	6
Fife	14	12	9	10
Forth Valley	6	7	6	7
Grampian	8	6	5	5
Greater Glasgow	4	4	2	1
Highland	3	3	4	4
Lanark	7	9	12	11
Lothian	2	2	3	3
Orkney	15	15	14	15
Shetland	12	13	10	12
Tayside	1	1	1	2
Western Isles	13	14	13	13
Coefficient of Variation	34.636	30.063	27.262	32.805

Occasionally, references are made to the absolute

values of these policy variables. These statistics have been included in Appendix C to provide the reader with more detailed information.

Policy Outputs:

The ten policy output variables provide two distinct groups and the summary variable. The hospital-related variables measure total hospital expenditures, general beds' expenditures, psychiatric beds' expenditures, and chronic beds' expenditures. The practitioner services variables are organised to present data regarding general practitioner expenditures, dental expenditures, pharmaceutical expenditures, optical expenditures and community health expenditures. The summary variable measures total health service expenditures.

Hospital Expenditures:

Table VI-1 indicates that the variation in the hospital expenditures per 1,000 population between Health Boards is relatively large. The values of the coefficient of variation for 1951, 1961, 1971 and 1976 respectively, are 34.636, 30.063, 27.262 and 32.805. These values confirm our generalisation that there is considerable variation in hospital expenditures per 1,000 population between Health Boards in Scotland. They are sufficiently large to suggest that this differentiation has been meaningful at each interval from 1951 - 1976.

The values of the coefficients of variation over time also suggest a general pattern in which the rate of

expenditure growth of the lower ranking Health Boards is greater than that of the higher ranking Health Boards. In fact, Tayside, which ranked highest in 1951, increased its spending by slightly more than 1786% by 1976. Orkney, which ranked lowest in 1951, increased its spending on hospitals by more than 3,504% by 1976. [1]

Although the value of V in 1976 is less than its value in 1951, this does not represent a consistent trend. The data in the Table indicate a continuing decrease in the degree of differentiation between 1951 and 1971; however, an increase occurs between 1971 and 1976.

Table VI-1 indicates the relative stability of the growth rates over time. Four of the five highest-ranked Health Boards in 1951 remain in the five highest-ranked Health Boards in 1976. Four of the five lowest-ranked Health Boards in 1951 maintain similar rankings in 1976.

General Beds' Expenditures:

Table VI-2 indicates that the degree of differentiation in expenditures on general beds per 1,000 population is relatively large. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively, are 36.812, 32.694, 30.726 and 39.232. These values confirm our generalisation that there is considerable variation in the general

beds' expenditures per 1,000 population of Health Boards in Scotland. They also indicate that this differentiation has been relatively large at each interval from 1951 to 1976.

Table VI-2

General Beds' Expenditures/1,000 Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	12	11	7	7
Ayrshire and Arran	6	9	12	14
Borders	11	13	15	10
Dumfries and Galloway	8	6	9	6
Fife	13	12	13	13
Forth Valley	9	10	8	8
Grampian	7	5	5	4
Greater Glasgow	2	3	1	1
Highland	4	4	4	5
Lanark	5	7	14	15
Lothian	3	1	3	3
Orkney	15	15	11	12
Shetland	10	8	10	11
Tayside	1	2	2	2
Western Isles	14	14	6	9
Coefficient of Variation	36.812	32.694	30.726	39.232

Table VI-2 indicates two distinct patterns in terms of the rates of growth of expenditures of the

various Health Boards. During the period from 1951 to 1971, the lower-ranked Health Boards increased their spending at a greater rate than the more highly-ranked Boards. In the period from 1971 to 1976, the trend was reversed. In fact, this five year reversal is so sharp that it provides a more accurate picture of the situation from 1951 to 1976. Greater Glasgow, which was ranked second in 1951, increased its spending by over 2,007% by 1976. Fife, which was ranked thirteenth in 1951, increased its spending by slightly over 1,794% during the same period. [2]

The same Table also demonstrates the relative stability of the pattern of growth in terms of ranking over time. Four of the five highest-ranked Health Boards in 1951 remain among the five highest spenders on general beds per capita in 1976. Three of the five lowest-ranked Health Boards in 1951 retain this status in 1976.

Psychiatric Beds' Expenditures:

Table VI-3 indicates that the degree of differentiation in expenditures on psychiatric beds per 1,000 population between Health Boards is quite large. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively, are 73.367, 69.037, 64.765, and 60.164. These values confirm our generalisation that there is considerable variation in

the psychiatric beds' expenditure per 1,000 population between Health Boards in Scotland. They also indicate that this differentiation has been quite large at each interval from 1951 to 1976.

Table VI - 3

Psychiatric Beds' Expenditures/1,000

Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	8	8	9	9
Ayrshire and Arran	12	12	12	12
Borders	10	9	10	11
Dumfries and Galloway	1	1	1	3
Fife	11	11	8	8
Forth Valley	2	2	2	1
Grampian	7	5	5	5
Greater Glasgow	6	7	7	7
Highland	3	4	4	4
Lanark	9	10	11	10
Lothian	4	6	6	6
Orkney	13	13	13	14
Shetland	13	13	13	14
Tayside	5	3	3	2
Western Isles	13	13	13	13
Coefficient of Variation	73.367	69.037	64.765	60.164

Table VI-3 also indicates that the rates of growth of psychiatric beds' expenditures varied between Health Boards. A pattern in which the lower-ranked Health Boards increased their expenditures at a higher rate than the highest-ranked Health Boards is confirmed by the reduction in the value of V. Ayrshire and Arran, which ranked twelfth in 1951, increased its spending by slightly more than 2,185% by 1976. Dumfries and Galloway, which ranked first in 1951, increased its spending by over 898% by 1976. [3]

The Table illustrates a consistent pattern in the expenditures of Health Boards on psychiatric beds over time. There is a reduction in the value of V at each interval from 1951 to 1976.

It also indicates that growth rates were quite stable over time. Four of the highest-ranked Health Boards in 1951 retained this status in 1976. Four of the bottom-ranked Health Boards in 1951 remained among the five bottom-ranked Boards in 1976.

Chronic Beds' Expenditures:

Table VI-4 indicates that the degree of differentiation in expenditures on chronic beds per 1,000 population between Health Boards is quite high, especially in the first two periods. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively, are 62.785, 54.897, 45.553, and

29.467. These values confirm our generalisation that there is considerable variation in the chronic beds' expenditures per 1,000 population between Health Boards in Scotland. They also indicate that this differentiation has been relatively large at each interval from 1951 to 1976.

Table VI-4

Chronic Beds' Expenditures/1,000

Rank Order

Health Board	year 1951	1961	1971	1976
Argyll and Clyde	5	3	6	5
Ayrshire and Arran	7	11	12	15
Borders	5	7	4	8
Dumfries and Galloway	14	12	13	11
Fife	13	15	10	14
Forth Valley	8	8	5	9
Grampian	10	5	11	13
Greater Glasgow	12	14	7	6
Highland	11	6	14	12
Lanark	3	10	9	7
Lothian	9	13	8	10
Orkney	6	2	2	2
Shetland	4	9	1	1
Tayside	2	4	3	4
Western Isles	1	1	15	3
Coefficient of Variation	62.785	54.897	45.553	29.467

Table VI-4 also indicates that the rates of growth of chronic beds' expenditures has varied between Health Boards. It appears that the rate of expenditure growth of lower-ranking Health Boards is greater than that of the higher-ranking Boards. The reduction in the value of V from 1951 to 1976 supports such a conclusion. Western Isles, for example, which ranked highest in 1951, increased its spending by slightly over 1,149% by 1976. Fife, which ranked thirteenth in 1951, increased its expenditures on chronic beds by slightly over 4,456% by 1956. [4]

The Table demonstrates the consistency of the pattern of growth rates over time. The value of V declines at each successive interval and it drops markedly in the 1971 to 1976 interval.

This consistency is reflected in terms of the rankings of the Health Boards over time as well. Four of the five highest-ranked Health Boards in 1951 maintain this status in 1976. Four of the five bottom-ranked Health Boards in 1951 maintained a similar status in 1976.

General Practitioner Expenditures:

Table VI-5 indicates that there is relatively large variation in the general practitioner expenditures per 1,000 population between Health Boards. The values of the coefficient of variation for 1951, 1961, 1971 and 1976 respectively, are 22.323, 20.928, 26.678 and 24.951.

These values lend support to our generalisation that there is considerable variation in general practitioner expenditures per 1,000 population between Health Boards in Scotland. They also indicate that this differentiation has been meaningful at each interval from 1951 to 1976.

Table VI-5

General Practitioner Expenditures/1,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	13	7	12	11
Ayrshire and Arran	9	8	10	13
Borders	4	4	3	6
Dumfries and Galloway	5	5	6	5
Fife	11	13	13	14
Forth Valley	12	14	11	12
Grampian	6	6	14	7
Greater Glasgow	8	12	9	10
Highland	3	9	5	4
Lanark	10	10	15	15
Lothian	14	11	8	9
Orkney	1	1	1	1
Shetland	2	2	2	2
Tayside	7	8	7	8
Western Isles	11	3	4	3
Coefficient of Variation	22.323	20.928	26.678	24.951

Table VI-5 also indicates that the rates of growth of general practitioner expenditures varied between Health Boards over time. The pattern in which the rates of growth of general practitioner expenditures of highly ranked Health Boards was larger than that of bottom ranked Health Boards was confirmed by the increase in the value of V from 1951 to 1976. Orkney, for example, which ranked first in 1951, increased its spending by slightly more than 729%. Lothian, which ranked fourteenth in 1951, increased its spending by slightly over 687% by 1976. [5]

The Table does demonstrate, however, that this was not a consistent trend throughout the period. From 1951 to 1961 a reduction in the degree of differentiation occured. From 1961 to 1971, the process was reversed. During the 1971 to 1976 period there was a slight reduction in the value of V.

In terms of rankings, the Table does indicate the relative stability of general practitioner expenditure growth rates over time. This is particularly true of the largest spenders. Four of the five highest ranked Health Boards of 1951 maintained this status in 1976. Only three of the five Health Boards at the bottom of the Table found themselves in a similar position by 1976.

Dental Expenditures:

Table VI-6

Dental Expenditures/1,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	12	11	11	11
Ayrshire and Arran	6	7	7	6
Borders	9	2	4	7
Dumfries and Galloway	8	9	8	10
Fife	4	6	6	8
Forth Valley	10	10	10	5
Grampian	7	4	3	3
Greater Glasgow	3	8	5	4
Highland	11	13	12	9
Lanark	5	5	9	9
Lothian	2	3	1	1
Orkney	15	15	14	13
Shetland	13	14	15	12
Tayside	1	1	2	2
Western Isles	14	12	13	14
Coefficient of Variation	21.723	23.919	18.701	24.986

Table VI-6 indicates that the degree of differentiation in expenditures on general dental services per 1,000 population between Health Boards is a meaningful one. The values of the coefficient of variation for 1951, 1961,

1971 and 1976, respectively are 21.723, 23.919, 18.701 and 24.986. These values confirm our generalisation that there is considerable variation in the dental expenditures of Health Boards per 1,000 population in Scotland. They also indicate that this differentiation has been reasonably large at each interval from 1951 to 1976.

The Table also indicates that the rates of growth of dental expenditures varied between Health Boards. Tayside, which ranked highest in 1951, experienced an expenditure growth of 313%. Orkney, which ranked fifteenth in 1951, had increased its dental expenditures by 352% by 1976. [6] This pattern in which the lowest ranked Health Boards increased their dental expenditures at a greater rate than the highest ranking Health Boards was not confirmed by changes in the value of V from 1951 to 1976. Lothian, which ranked second in 1951, increased its expenditures by 375% by 1976. Western Isles, which ranked fourteenth in 1951, increased its expenditures by only 183% by 1976. It appears that the average growth rate of the more highly ranked Health Boards was slightly higher than that of the bottom ranked Health Boards. This coincides with the changes in the value of V during the period.

Although the value of V is greater for 1976 than for 1951, this does not represent a consistent trend. The data in Table VI-6 indicate an increase in

the value of V from 1951 to 1961, a decrease from 1961 to 1971 and another increase from 1971 to 1976.

The Table also indicates the relative stability of growth rates over time. Three of the five highest ranked Health Boards of 1951 maintain their position in 1976. Four of the five lowest ranked Health Boards remain in the bottom third of the Table in 1976.

Pharmaceutical Expenditures:

Table VI-7

Pharmaceutical Expenditures/1,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	12	9	10	9
Ayrshire and Arran	4	4	2	1
Borders	13	11	3	3
Dumfries and Galloway	14	13	8	5
Fife	3	8	7	6
Forth Valley	8	7	11	4
Grampian	6	10	15	8
Greater Glasgow	1	6	6	5
Highland	9	15	14	13
Lanark	2	3	12	7
Lothian	7	2	4	10
Orkney	5	1	1	2
Shetland	10	5	5	14
Tayside	11	14	13	11
Western Isles	15	12	9	12
Coefficient of Variation	16.586	13.961	8.779	6.100

Table VI-7 indicates that the degree of differentiation in pharmaceutical chemists' expenditures per 1,000 population is relatively small. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively are 16.586, 13.961, 8.779 and 6.100. These values do not confirm our generalisation that there is considerable variation in the pharmaceutical chemists' expenditures per 1,000 population between Health Boards in Scotland.

The Table also indicates that the rates of growth of pharmaceutical expenditures varied between Health Boards. It appears that the lower ranked Health Boards increased their expenditures at a higher rate than the top ranked Boards. This impression is supported by the nature of the changes in the value of V over time. Greater Glasgow, for example, which ranked first in 1951, experienced an increase of 800% by 1976. Western Isles, which ranked fifteenth in 1951, increased its expenditures by 1,587% during the same period. [7]

The data presented in the Table do demonstrate the presence of a consistent trend in which there was a continuing reduction in the extent of variation in pharmaceutical expenditures between Health Boards over time. By 1976, the value of V is almost one-third of what it was in 1951, after decreases in 1961 and 1971.

It is not surprising that the Table should indicate that the growth rates were rather unstable over

time. Only three of the five top ranked Boards in 1951 retained such status by 1976. Two of the five bottom ranked Boards in 1951 remained in the bottom third by 1976. Some of the changes were quite dramatic. Borders Health Board, for example, climbed from thirteenth position in 1951 to third position in 1976.

Optical Expenditures:

Table VI-8

Optical Expenditures/1,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	10	9	11	6
Ayrshire and Arran	7	12	6	4
Borders	13	13	13	15
Dumfries and Galloway	8	6	9	11
Fife	12	11	5	5
Forth Valley	6	8	10	10
Grampian	11	10	8	12
Greater Glasgow	1	3	2	2
Highland	9	15	12	14
Lanark	3	2	11	7
Lothian	5	5	4	8
Orkney	14	7	7	13
Shetland	4	1	1	1
Tayside	2	4	3	3
Western Isles	15	14	14	9
Coefficient of Variation	18.243	21.015	29.229	25.655

Table VI-8 indicates that the extent of variation in expenditures on optical services per 1,000 population between Health Boards is relatively large. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively, are 18.243, 21.015, 29.229 and 25.655. These values confirm our generalisation that there is considerable regional variation in optical expenditures per 1,000 population between Health Boards in Scotland.

Table VI-8 also indicates that the rates of growth of optical expenditures varied between Health Boards. The increase in the value of V over time suggests that the higher ranked Boards increased their expenditures at a more rapid rate than the lower ranked Boards. Greater Glasgow, which ranked first in 1951, increased its spending by 391%. Western Isles, which ranked fifteenth in 1951, increased its spending by 529% by 1976. This example appears to contradict the impression created in the examination of the value of V over time. Shetland, which ranked fourth in 1951, increased its spending by 1,003% by 1976. Borders, which ranked thirteenth in 1951 increased its spending by only 303% during the same period. [8] Although this latter example supports the conclusion raised by the changes in the value of V, the previous example suggests a possibility of considerable instability in the growth pattern over time.

Although the data in the Table indicate a growth in the extent of variation between Health Boards during the period, this does not mean that there was a consistent pattern. From 1951 to 1971 there was a steady increase in variation; however, from 1971 to 1976, there was a decrease in optical expenditure differences between regions.

A closer examination of the rankings over time provides some support for our earlier suggestion regarding the relative instability of growth rates over time. Only three of the five top ranked Health Boards in 1951 retained this status in 1976. Three of the five bottom ranked Health Boards of 1951 remained in the bottom third in 1976. In addition, some Health Boards experienced great fluctuations in rank during the period. Orkney, for example, was ranked fourteenth in 1951, seventh in 1961 and 1971 and thirteenth in 1976. Other Boards maintained their positions with relatively little change. Borders, for example, was thirteenth in 1951, 1961, 1971 and fifteenth in 1976.

Community Health Services:

Table VI-9 provides only data for 1976. These figures indicate that the degree of differentiation in expenditures on community health services per 1,000 population between Health Boards is rather strong. The value of the coefficient of variation for 1976 is 35.441. This value confirms our generalisation that

there is considerable variation in the expenditures on community health services between Health Boards in Scotland.

Table VI-9

Community Health Expenditures/1,000
Rank Order

Health Board	1976
Argyll and Clyde	14
Ayrshire and Arran	15
Borders	11
Dumfries and Galloway	9
Fife	8
Forth Valley	12
Grampian	5
Greater Glasgow	10
Highland	4
Lanark	6
Lothian	7
Orkney	3
Shetland	2
Tayside	13
Western Isles	1
Coefficient of Variation	35.441

Total Expenditures:

Since community health expenditure data is available only for the most recent period, it is impossible

to calculate total health expenditures for years other than 1976.

Table VI-10

Total Expenditures/1,000
Rank Order

Health Board	1976
Argyll and Clyde	8
Ayrshire and Arran	15
Borders	11
Dumfries and Galloway	6
Fife	13
Forth Valley	7
Grampian	5
Greater Glasgow	1
Highland	4
Lanark	14
Lothian	3
Orkney	12
Shetland	9
Tayside	2
Western Isles	10
Coefficient of Variation	20.993

Table VI-10 indicates that there is rather extensive variation in the total expenditures per 1,000 population of the Health Boards. The value of the coefficient of variation for 1976 is 20.993. This

supports our generalisation that there is considerable variation in the total health service expenditures per 1,000 population between Health Boards in Scotland.

Policy Outcomes:

The eleven policy outcome variables fell into two distinct categories. The staff variables measured the number of hospital doctors, the number of hospital nurses, the number of general medical practitioners, the number of general dental practitioners, the number of opticians and the number of community health staff. The facilities variables dealt with the total number of hospital beds, the number of general beds, the number of psychiatric beds, the number of chronic beds and the number of pharmaceutical chemists' outlets.

Hospital Doctors:

Table VI-11 indicates that the degree of differentiation in the number of hospital doctors per 10,000 population between Health Boards is quite high. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively, are 39.457, 50.578, 52.328 and 64.415. These values lend support for our generalisation that there is considerable variation in the number of hospital doctors per 10,000 population between Health Boards in Scotland. They also indicate that this differentiation has been rather large at each interval from 1951 to 1976.

Table VI-11

Hospital Doctors / 10,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	10	9	9	8
Ayrshire and Arran	7	10	11	10
Borders	5	7	13	12
Dumfries and Galloway	11	5	5	6
Fife	12	12	6	9
Forth Valley	9	8	8	7
Grampian	4	4	4	4
Greater Glasgow	3	3	2	1
Highland	6	6	7	5
Lanark	8	11	12	11
Lothian	1	1	1	3
Orkney	13	15	14	14
Shetland	14	14	15	15
Tayside	2	2	3	2
Western Isles	15	13	10	13
Coefficient of Variation	39.457	50.578	52.328	64.415

The Table also indicates that the rates of growth in the number of hospital doctors varied between Health Boards. It appears that the top ranked Health Boards increased the number of hospital doctors at a greater rate than the bottom ranked Health Boards. This is supported by the changes in the value of V

from 1951 to 1976. Lothian, for example, which ranked first in 1951, increased the number of hospital doctors by 373%. Western Isles, which ranked fifteenth in 1951, experienced an increase of 327% by 1976. [9]

There is a large increase in the value of V from 1951 to 1976 as Table VI-11 demonstrates. The data indicate a consistent trend over time. There is a continuing increase in the degree of differentiation in the number of hospital doctors by Health Board at each interval.

It is not surprising that the Table also indicates a relatively stable pattern of growth over time. Four of the top five Health Boards in 1951 maintained this status in 1976. Three of the five bottom ranked Health Boards remained in the bottom third of the Table in 1976.

Hospital Nurses:

Table VI-12 indicates a relatively large degree of differentiation in the number of hospital nurses per 10,000 population between Health Boards. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively, are 35.954, 29.656, 23.600 and 24.449. These values support our generalisation that there is considerable variation in the number of hospital nurses per 10,000 population between Health Boards in Scotland. They also indicate that this

differentiation has been relatively large at each interval from 1951 to 1976.

Table VI-12

Hospital Nurses/10,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	9	9	8	8
Ayrshire and Arran	11	11	14	15
Borders	10	13	9	9
Dumfries and Galloway	5	6	7	4
Fife	13	10	10	12
Forth Valley	7	7	6	7
Grampian	4	3	4	5
Greater Glasgow	3	5	3	2
Highland	6	4	5	6
Lanark	8	8	11	11
Lothian	2	2	2	3
Orkney	15	15	13	13
Shetland	12	14	12	10
Tayside	1	1	1	1
Western Isles	14	12	15	14
Coefficient of Variation	35.934	29.656	23.600	24.449

Table VI-12 demonstrates that there is considerable difference in the rates of growth of the number of hospital nurses employed by Health Boards.

It appears that the bottom ranked Health Boards of 1951 expanded their stock of hospital nurses at a greater rate than the top ranked Health Boards. The decline in the value of V from 1951 to 1976 supports such a conclusion. Tayside, for example, which ranked first in 1951, experienced an increase of 135%. Orkney, which ranked fifteenth in 1951, increased the number of hospital nurses by 306% by 1976. [10]

The Table indicates that the value of the coefficient of variation in 1976 is less than it was in 1951. This does not produce a consistent pattern because, although there had been a decline in the extent of variation at each interval from 1951 to 1971, an increase occured from 1971 to 1976.

Despite the changes in the pattern of regional differences, the growth rates appear to have been relatively stable over time. Five of the top ranked Health Boards in 1951 remain in the top third in 1976. Three of the five bottom ranked Boards of 1951 retained this status in 1976.

General Practitioners:

Table VI-13 indicates that the degree of differentiation in the number of general practitioners per 10,000 population between Health Boards is quite high. The values of the coefficient of variation for 1971 and 1976, respectively, are 30.448 and 24.223. These values provide support for our generalisation that

there is considerable variation in the number of general practitioners per 10,000 population between Health Boards in Scotland. They also indicate that this variation has been relatively large in both 1971 and 1976.

Table VI-13

General Practitioners/10,000
Rank Order

Health Board	Year 1971	1976
Argyll and Clyde	11	11
Ayrshire and Arran	12	13
Borders	5	8
Dumfries and Galloway	6	9
Fife	13	14
Forth Valley	12	12
Grampian	7	6
Greater Glasgow	9	5
Highland	4	2
Lanark	14	15
Lothian	10	7
Orkney	1	1
Shetland	2	3
Tayside	8	10
Western Isles	3	4
Coefficient of Variation	30.448	24.223

The Table also demonstrates that the rate of

growth of the number of general practitioners has varied between Health Boards. This pattern in which the rate of growth of the lower ranked Health Boards is greater than that of the higher ranked Boards is supported by the decline in the value of V from 1971 to 1976. Orkney, which ranked first in 1971, experienced a growth of -3% by 1976. Lanark, which was ranked fourteenth in 1971, increased its supply of general practitioners by 14% during the same period. [11]

The Table does present a picture of stability in the growth rates over time. Four of the five top ranked Health Boards in 1971 maintain this status in 1976. All of the five lowest ranked Health Boards of 1971 remain in the bottom third of the Table in 1976.

Due to the limited data available, even though there is a decline in the value of V from 1971 to 1976, there is not enough evidence to indicate whether this can be construed as a trend involving a continuing reduction in the extent of variation between Health Boards.

Dentists:

Table VI-14 indicates that there is a rather large degree of differentiation in the number of general dental practitioners per 10,000 population between Health Boards. The values of the coefficient of variation for 1971 and 1976, respectively, are

19.751 and 22.501. These values lend support to our generalisation that there is considerable variation in the number of general dental practitioners per 10,000 population between Health Boards in Scotland. They also indicate that the magnitude of this variation has been meaningful at both intervals.

Table VI-14

Dentists/10,000
Rank Order

Health Board	Year	
	1971	1976
Argyll and Clyde	10	8
Ayrshire and Arran	3	4
Borders	6	5
Dumfries and Galloway	12	13
Fife	5	6
Forth Valley	8	9
Grampian	9	11
Greater Glasgow	6	2
Highland	4	7
Lanark	11	12
Lothian	1	1
Orkney	13	14
Shetland	14	15
Tayside	2	3
Western Isles	7	10
Coefficient of Variation	19.751	22.501

The data presented in the Table suggest that the rates of growth in the number of dentists varied between Health Boards. This pattern, in which the rate of growth of the number of dentists of the higher ranked Health Boards is greater than that of the lower ranked Boards, is supported by the increase in the value of V from 1971 to 1976. Lothian, for example, which ranked first in 1971, increased its supply of dentists per capita by 6% by 1976. Shetland, the fourteenth ranked Health Board in 1971, experienced a decline of 8% in the number of dentists per capita by 1976. [12]

Although Table VI-14 points out that there is an increase in the value of V from 1971 to 1976, there is insufficient data to determine whether this is a trend involving a continuing increase in the extent of variation between Health Boards.

The Table does indicates that the rates of growth in the number of dentists per capita between Health Boards is relatively stable. Three of the five top ranked Health Boards in 1971 remain in the upper third in 1976. Four of the five lowest ranked Boards maintain this status in 1976.

Opticians:

The data in Table VI-15 indicate that the degree of variation in the number of opticians per 10,000 population is a relatively large one, especially in 1976. The values of the coefficient of variation for 1961, 1971

and 1976, respectively, are 20.345, 26.166, and 38.831. These values support our generalisation that there is considerable variation in the number of opticians per 10,000 population between Health Board regions in Scotland. They also demonstrate that the magnitude of the differentiation has been meaningful at each interval from 1961 to 1976.

Table VI-15

Opticians/10,000
Rank Order

Health Board	Year 1961	1971	1976
Argyll and Clyde	3	1	4
Ayrshire and Arran	6	3	8
Borders	2	14	3
Dumfries and Galloway	14	5	11
Fife	13	13	6
Forth Valley	11	12	7
Grampian	10	8	9
Greater Glasgow	1	4	5
Highland	15	7	12
Lanark	7	10	13
Lothian	9	6	1
Orkney	8	15	14
Shetland	5	9	10
Tayside	4	2	2
Western Isles	12	11	12
Coefficient of Variation	20.345	26.166	38.831

The Table points out that the rates of growth in the number of opticians has varied from Health Board region to Health Board region. The pattern, in which the rate of growth of the higher ranked Health Boards is greater than that of the lower ranked Health Boards is supported by the increase in the value of V from 1961 to 1976. Greater Glasgow, for example, which ranked first in 1961, experienced a decrease of 3%. Dumfries and Galloway, the fourteenth ranked Health Board of 1961, experienced a decrease of 10% by 1976. [13]

As Table VI-15 shows, the fact that the value of V increases from 1961 to 1976 does indicate the presence of a consistent trend. There has been a continuing increase in the extent of the variation at each interval.

The Table also demonstrates that the rates of growth in the number of opticians has been relatively stable over time. Four of the five top ranked Health Boards in 1961 maintained this status in 1976. Three of the five bottom ranked Health Boards of 1961 remained in the bottom third of the Table in 1976.

Community Health Staff:

Table VI-16 indicates that the degree of differentiation in the number of community health staff per 10,000 population between Health Boards is quite large. The value of the coefficient of variation for 1976 is 49.619. This value supports our generalisation that there is considerable regional variation in the

number of community health staff per 10,000 population between Health Boards in Scotland. Unfortunately, there is insufficient data to allow us to come to any conclusions regarding trends over time and the stability of any trends which might exist in this policy outcome variable.

Table VI-16

Community Health Staff/10,000
Rank Order

Health Board	1976
Argyll and Clyde	11
Ayrshire and Arran	14
Borders	13
Dumfries and Galloway	9
Fife	10
Forth Valley	15
Grampian	5
Greater Glasgow	7
Highland	4
Lanark	8
Lothian	6
Orkney	2
Shetland	3
Tayside	12
Western Isles	1
Coefficient of Variation	49.619

Total Beds:

Table VI-17

Total Beds/10,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	9	9	10	8
Ayrshire and Arran	11	11	13	13
Borders	10	10	9	9
Dumfries and Galloway	2	3	6	5
Fife	12	13	12	12
Forth Valley	3	2	3	2
Grampian	8	6	4	6
Greater Glasgow	5	7	5	4
Highland	4	4	2	3
Lanark	6	8	8	10
Lothian	7	5	7	7
Orkney	15	15	15	15
Shetland	13	12	11	11
Tayside	1	1	1	1
Western Isles	14	14	14	14
Coefficient of Variation	34.497	31.798	26.502	25.307

Table VI-17 indicates that the degree of differentiation in the number of total beds per 10,000 population between Health Boards is a relatively large one. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively, are

34.497, 31.798, 26.502 and 25.307. These values lend support for our generalisation that there is considerable variation in the number of total beds per 10,000 population between Health Boards in Scotland. They also indicate that the magnitude of variation is meaningful at each interval from 1951 to 1976.

The data in the Table demonstrate that the rates of growth in the number of total beds per capita varied between Health Boards. The pattern, in which the rate of growth of total hospital beds of the lower ranked Health Boards was greater than that of the higher ranked Boards, is supported by the reduction in the value of V from 1951 to 1976. Tayside, for example, which ranked first in 1951, experienced a decrease of almost 13% by 1976. Orkney, the fifteenth ranked Board in 1951, experienced an increase of over 68% during the same period. [14]

As Table VI-17 demonstrates, the decline in the value of V from 1951 to 1976 does represent a consistent trend. At each interval during the period there is a continuing decrease in the extent of differentiation between Health Boards.

The same Table indicates a very stable pattern of growth rates over time. Five of the top five ranked Health Boards in 1951 remained in the upper third of the Table in 1976. Four of the five bottom ranked Health Boards in 1951 maintained this status in 1976.

Psychiatric Beds:

Table VI-18

Psychiatric Beds/10,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	9	9	9	9
Ayrshire and Arran	12	12	12	12
Borders	10	10	10	11
Dumfries and Galloway	1	2	2	3
Fife	11	11	11	10
Forth Valley	2	1	1	1
Grampian	6	5	5	6
Greater Glasgow	8	8	6	5
Highland	4	4	4	2
Lanark	5	7	8	7
Lothian	7	6	7	8
Orkney	13	13	13	14
Shetland	13	13	13	14
Tayside	3	3	3	4
Western Isles	13	13	13	13
Coefficient of Variation	65.606	66.824	64.347	63.113

Table VI-18 indicates that the degree of differentiation in the number of psychiatric beds per 10,000 population between Health Boards is a large one. The values of the coefficient of variation for 1951,

1961, 1971 and 1976, respectively, are 65.606, 66.824, 64.347 and 63.113. These values provide support for our generalisation that there is considerable variation in the number of psychiatric beds per 10,000 population between Health Boards in Scotland. They also point out that the extent of the differentiation at each interval is meaningful.

The data in the Table demonstrate that the rates of growth in the number of psychiatric beds varied between Health Boards. A pattern, in which the rates of growth of the lower ranked Health Boards is greater than those of the higher ranked boards is supported by the reduction in the value of V from 1951 to 1976. Dumfries and Galloway, for example, which ranked first in 1951, experiences a 27% decline by 1976. Ayrshire and Arran, which was ranked twelfth in 1951, increases its supply of psychiatric beds per capita by 11% by 1976. [15]

Although the value of V in 1976 is less than its value in 1951, this does not represent a consistent trend. There is an increase in the extent of variation between 1951 and 1961. From 1961 to 1976, there is a continuing reduction in the extent of the differentiation between Health Boards.

Table VI-18 demonstrates that the rates of growth in the number of psychiatric beds per capita over time have been quite stable. Four of the five top ranked Health

Boards in 1951 maintained this status in 1976. Four of the five bottom ranked Health Boards in 1951 remained in the bottom third of the Table in 1976.

Chronic Beds:

Table VI-19

Chronic Beds/10,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	9	3	6	6
Ayrshire and Arran	12	10	10	13
Borders	6	6	4	5
Dumfries and Galloway	10	12	14	12
Fife	13	15	13	15
Forth Valley	4	9	8	10
Grampian	7	7	7	11
Greater Glasgow	14	13	11	9
Highland	11	11	15	7
Lanark	8	8	5	8
Lothian	15	14	9	14
Orkney	5	2	2	2
Shetland	2	4	1	1
Tayside	3	5	3	4
Western Isles	1	1	12	3
Coefficient of Variation	52.255	49.229	52.554	40.771

Table VI-19 indicates that the variation in the number of chronic beds per 10,000 population between

Health Boards is quite large. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively, are 52.255, 49.229, 52.554 and 40.771. These values support our generalisation that there is considerable regional variation in the number of chronic beds per capita between Health Boards in Scotland. They also indicate that this differentiation has been meaningful at each interval from 1951 to 1976.

The Table also indicates that the rate of growth in the number of chronic beds varied between regions. This pattern in which the rate of growth in the number of chronic beds of the lower ranked Health Boards is greater than that of the higher ranked Health Boards is supported by the reduction in the value of V from 1951 to 1976. Western Isles, for example, which was ranked first in 1951, experienced a decrease of 14% by 1976. Lothian, the fifteenth ranked Health Board in 1951, increased its stock of chronic beds by 118% during the same period. [16]

Although the value of V in 1976 is less than its value in 1951, this does not indicate a consistent trend. Table VI-19 demonstrates that there is a decrease in the extent of variation from 1951 to 1961. This is followed by an increase in the 1961-1971 period and another decrease from 1971 to 1976.

The Table does indicate the relative stability of the rates of growth in the number of chronic beds per

capita over time. Four of the five top ranked Boards of 1951 retain this status in 1976. Three of the five bottom ranked Health Boards remain in the bottom third of the Table in 1976.

General Beds:

Table VI-20

General Beds/10,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	11	12	12	7
Ayrshire and Arran	6	11	15	12
Borders	12	9	8	8
Dumfries and Galloway	8	8	11	6
Fife	13	13	14	14
Forth Valley	10	10	13	13
Grampian	7	6	6	5
Greater Glasgow	2	3	3	1
Highland	4	4	2	4
Lanark	5	5	7	15
Lothian	3	2	4	3
Orkney	14	14	10	11
Shetland	9	7	9	10
Tayside	1	1	1	2
Western Isles	15	15	5	9
Coefficient of Variation	35.525	30.045	24.948	25.650

Table VI-20 indicates that the variation in the number of general beds per 10,000 population between Health Boards is rather large. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively,are 35.525,30.045, 24.948 and 25.650. These values lend support to our generalisation that there is considerable variation in the number of general beds per 10,000 population between Health Boards in Scotland. They also indicate that this differentiation has been meaningful at each interval from 1951 to 1976.

The data in the table demonstrate that the variation in the rates of growth of the number of general beds per capita between Health Boards has been quite large. This pattern, in which the lower ranked Health Boards' rate of growth is greater than that of the higher ranked Health Boards is supported by the reduction in the value of V for the period 1951 to 1976. Tayside, for example, which ranked first in 1951, experienced a decrease of 26% by 1976. Western Isles, the fifteenth ranked Health Board in 1951, increased its stock of general beds per capita by 86% during the same period. [17]

Although the value of V in 1976 is less than its value in 1951, this does not represent a consistent trend. The data in Table VI-20 indicate a continuing reduction in variation from 1951 to 1971, but this is followed by an increase from 1971 to 1976.

The Table demonstrates a difference in the stability of the growth rates of the top and bottom ranked Health Boards. The top ranked Boards were quite stable. Four of the five top ranked Health Boards of 1951 maintained this status in 1976. The bottom ranked Health Boards were rather unstable. Only two of the five bottom ranked Boards of 1951 remained in the bottom third by 1976. Some of the Health Boards experienced great fluctuations in rank. Ayrshire and Arran, for example, ranked sixth in 1951, eleventh in 1961, fifteenth in 1971 and twelfth in 1976.

Pharmaceutical Chemists' Outlets:

Table VI-21 indicates that there is considerable variation in the number of pharmaceutical chemists' outlets per 10,000 population between Health Boards. The values of the coefficient of variation for 1951, 1961, 1971 and 1976, respectively, are 24.297, 23.494, 24.840 and 27.363. These values confirm our generalisation that there is considerable variation in the number of pharmaceutical chemists' outlets per 10,000 population between Health Boards in Scotland. They also indicate that the extent of the differentiation has been meaningful at each interval during the period.

The Table also demonstrates that the rates of growth in the number of pharmacists'outlets per capita have varied between regions. A pattern in which the growth rates of the higher ranked Boards are greater than those

of the lower ranked Boards is supported by the increase in the value of V from 1951 to 1976. Borders, for example, which ranked second in 1951, experienced a decrease of 35% by 1976. Western Isles, which ranked fourteenth in 1951 suffered a decline of over 48% during the same period.[18]

Table VI-21

Pharmaceutical Chemists' Outlets/10,000
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	11	7	11	11
Ayrshire and Arran	8	6	7	7
Borders	2	1	1	2
Dumfries and Galloway	6	13	6	6
Fife	4	4	4	4
Forth Valley	10	10	9	9
Grampian	1	2	2	1
Greater Glasgow	9	8	10	10
Highland	7	9	3	5
Lanark	12	12	13	14
Lothian	3	3	5	3
Orkney	15	14	12	12
Shetland	13	9	13	13
Tayside	5	5	8	8
Western Isles	14	11	14	15
Coefficient of Variation	24.297	23.494	24.840	27.363

Although the value of V in 1976 is larger than its value in 1951, this does not represent a consistent pattern. The data in Table VI-21 indicate a decrease in the extent of variation for 1951 to 1961, but this is followed by increases from 1961 to 1976.

The Table also demonstrates the relative stability of growth rates over time. Four of the five highest ranked Health Boards in 1951 retained this status in 1976. Five of the lowest ranked Health Boards of 1951 maintained their position in the bottom third of the Table in 1976.

Policy Variation over Time:

Table VI-22

Coefficient of Variation by Policy Variable 1951 and 1976

Variable	Coefficient of Variation 1951	1976	% Change
Hospital Expenditures	34.636	32.805	-5.29
General Beds' Exp.	36.812	39.232	6.57
Psychiatric Beds' Exp.	73.367	60.164	-17.99
Chronic Beds' Exp.	62.785	29.467	-53.07
G.P. Expenditures	22.323	24.951	10.53
Dental Expenditures	21.723	24.986	15.02
Pharmaceutical Exp.	16.586	6.100	-63.22
Opticians' Exp.	18.243	25.655	40.63
Hospital Doctors	39.457	64.415	63.25
Hospital Nurses	35.934	24.449	-31.96
General Practitioners	30.448	24.223	-20.44*
Dentists	19.751	22.501	13.92*
Opticians	20.345	38.831	90.86**
Total Beds	34.495	25.307	-26.64
Psychiatric Beds	65.606	63.113	-3.79
Chronic beds	52.255	40.771	-27.80
General Beds	35.525	25.650	-27.80
Pharmceutical Chemists Outlets	24.297	27.363	12.62

* 1971-1976
** 1961-1976

Table VI-22 demonstrates the amount of change in the values of the coefficient of variation for each policy variable for which data were available in a least two of the intervals used in this study. If we define a major reduction in regional variation as a decline of 50% or more in the value of V over time, we find that in only two cases, chronic beds' expenditures and pharmaceutical expenditures, is the decline in variation sufficient to meet such a condition. Indeed, the Table indicates that in the case of 8 of the 18 variables, the degree of variation actually increased during the period. This evidence provides ample support for our generalisation that there has been no major reduction in the extent of policy variation between Health Boards in Scotland from 1951 to 1976.

Consistency of Deprivation:

In a previous chapter it was suggested that regions which were relatively deprived in terms of one policy indicator were likely to be similarly deprived on all policy indicators. This feature was examined from four different perspectives. Initially, we examined the five Health Boards with the lowest scores on hospital expenditures per capita in 1976 to see if they retained such a position with the other policy indicators. At the second stage, we compared the status of the five Health Boards with the lowest scores on hospital expenditures in 1951 to see if they retained such positions

with the other policy indicators by 1976. This introduced a temporal perspective which provided some insight into the consistency of growth rates over time.

One difficulty with this type of procedure is that it ignores situations in which a Health Board ranked fourteenth on one dimension is ranked nine on another. Although the ranking of the Health Board on the latter variable may still be below the medican, it appears that this Board is not deprived. In order to accomodate this problem and to indicate more clearly the possibility of particular patterns of variation, the data have been reorganised in two ways.

In the first case, those Boards which ranked in the bottom third in terms of hospital expenditure per capita in 1976 are examined to determine the number of times they achieve either similar or top third rankings for the other policy variables for 1976. In the second situation, the same procedure is applied, but the Boards examined are determined by their rankings in terms of hospital expenditures per capita in 1951.

Table VI-23

Health Board Rankings 1976 - Bottom Third and Above

Health Board	Times Ranked Bottom Third	Times Ranked Above Bottom Third
Ayrshire and Arran	13	7
Lanark	10	10
Orkney	12	8
Shetland	8	12
Western Isles	9	11

Table VI-23 indicates that for 1976, the five Health Boards ranked lowest in terms of hospital expenditures per capita remained in the bottom third of the Table for 52% of the total possibilities when all of the other policy variables are examined. This suggests that our original generalisation is incorrect.

Table VI-24

Health Board Rankings 1951-1976 Bottom Third and Above

Health Board	Times Ranked Bottom Third	Times Ranked Above Bottom Third
Argyll and Clyde	3	12
Fife	7	8
Orkney	11	4
Shetland	8	7
Western Isles	9	6

When the temporal dimension is added, the results are equally revealing. Table VI-24 indicates that the five Health Boards ranked lowest in terms of hospital expenditures per capita in 1951 achieved this low ranking on other policy variables approximately 51% of the time in 1976.

Table VI-25

Health Board Rankings 1976 - Bottom and Top Third

Health Board	Bottom Third	Top Third
Ayrshire and Arran	13	3
Lanark	10	0
Orkney	12	7
Shetland	8	8
Western Isles	9	6

Table VI-25 provides additional verification of our initial findings. In only 24% of the opportunities did the lowest ranked hospital expenditure Boards of 1976 achieve top third rankings on the other policy variables. What is interesting, however, is the discrepancy in the pattern of the three small Health Boards- Orkney Shetland and Western Isles - as compared to that of Ayrshire and Arran and Lanark. The former Boards appear in the top third almost as frequently as they do in the bottom third. This is not the case for the latter two Health Boards.

Table VI-26

Health Board Rankings 1951 - 1976 Bottom and Top Third

Health Board	Bottom Third 1951	Top Third 1976
Argyll and Clyde	3	2
Fife	7	2
Orkney	11	7
Shetland	8	8
Western Isles	9	6

When we examine Table VI-26, the same conclusions can be drawn from the evidence. In only 33% of the possible occasions of 1976 do we find the 1951 bottom ranked hospital expenditure Health Boards achieving top ranked status for other policy dimensions. Once again, it appears that Orkney, Shetland and Western Isles achieve top rankings almost as frequently as they achieve bottom rankings.

The evidence presented in these Tables clearly indicates that Health Boards which are deprived in one aspect of health policy are not necessarily deprived on other aspects. To some extent, this situation results from the almost schizoid pattern of the Shetland, Orkney and Western Isles Health Boards.

Conclusion and Discussion:

In this chapter we attempted to come to some conclusions regarding two aspects of the research problem. The initial concern was to determine if there was variation between Health Board Regions in terms of the health policy outputs and outcomes and to ascertain the extent of such variation. The second major focus dealt with the existence of particular patterns of variation. In this context we attempted to determine if there have been major changes in the extent of variation over time and if some Health Board Regions were deprived consistently, in terms of expenditures, facilities and staffing levels when compared with other Health Board Regions.

The examination of the values of the coefficients of variation provided support for all but one of our empirical generalisations insofar as the extent of variation was concerned. The only deviant case in which regional variation was deemed not to be of major proportions involved pharmaceutical expenditures. This seemed to be particularly puzzling when one found

that the variation in the number of pharmaceutical chemists' outlets per capita between regions was quite large.

This results suggests that prescribing practices vary from region to region in Scotland. Those areas with relatively fewer pharmaceutical chemists' outlets are ones with either higher costs per prescriptions or more prescriptions per capita than areas with rather more pharmaceutical chemists' outlets. What this indicates is that the efforts of the Home and Health Department to remove such regional variations in prescribing practices which were described in Chapter IV have been unsuccessful.

The evidence presented in this chapter demonstrates clearly that a reduction in the extent of regional variation over time has not occured to any great extent. While there have been a few successes involving chronic beds' expenditures and pharmaceutical expenditures, in all other cases, the extent of variation remains a large one. Even more distressing is the fact that for 44% of the variables examined, the degree of differentiation between regions has actually increased.

The evidence indicated that our generalisation regarding the consistency of relative deprivations of Health Board Regions was not grounded in fact. To a large extent, the reason for this was the peculiar

pattern of three Health Boards - Orkney, Shetland and Western Isles.

These three Boards were consistently highly ranked on three areas of health care - community health staff and expenditures, chronic care beds and expenditures, and general practitioner ratios and expenditures. They tended to be rather poorly off on virtually all other dimensions examined.

This finding demonstrates the continuing influence of the old Highlands and Islands Medical Scheme, in which the emphasis was on the provision of primary care staff and facilities. The puzzling aspect of this situation, however, is the different pattern of the Highlands Health Board.

One way of explaining this puzzle is to suggest that the efforts of the Scottish Health Department to create a hospital centre at Inverness in the fifth Hospital Board Region, must have met with some success. It may well be that we might find two basic patterns of health care being practiced in Scotland. In Orkney, Shetland and the Western Isles, the primary focus appears to be upon primary care. [19] In other areas, a more hospital centred approach may be the normal practice. [20]

In the case of chronic care, the Highlands Health Board resembles the three other Boards. This

clearly represents a consistent response to a population which contains a large percentage of elderly people as described in Chapter II.

This chapter provides three basic conclusions. It suggests the possibility of different patterns of health care delivery systems operating in different parts of Scotland. In some areas, it appears that the emphasis is on primary care. In other areas a more hospital centred approach appears to predominate. Although there has been some work on this subject in Britain recently [21], the evidence presented suggests that further work in this area might be of considerable use in the examination of the effectiveness of alternative health care delivery systems. As such, this issue is beyond the scope of our research project.

The evidence presented in this chapter clearly demonstrates that there is considerable variation between Health Board Regions in terms of health care facilities, expenditures and staffing in Scotland throughout the 1951 to 1976 period. In this respect, regional variation is as characteristic of the Scottish Health Service as it is of the NHS in England and Wales.

In terms of policy analysis, this chapter demonstrates the ineffectiveness of the Scottish Health Service. In a twenty-five year period, the National Health Service in Scotland has failed to achieve one of its goals of eliminating regional inequality in the

health care system. In fact, in some policy areas, the data suggests that the regional differentiation is worse in 1976 than it was in 1951 when the new system was just beginning to operate.

In terms of the research project, this chapter has provided a clear basis to support our original contention that regional variation was a serious feature of the Scottish Health Service. In the chapters which follow, an attempt is made to understand and explain why such a situation has developed and continued under the National Health Service in Scotland.

Chapter VII

The Independent Variables: A Description and Preliminary Analysis

Introduction:

The policy model outlined in Chapter III presents three tentative explanations of policy variation in the Scottish Health Service. Each of these possibilities is based on the idea that variation between Health Board Regions in terms of the independent variable may explain a large percentage of the variation in the dependent variables, which were discussed in the previous chapter.

As a result, three sets of independent variables have been established. The socio-economic variables include income, urbanisation, industrialisation and region. The health status variables are crude death rates, standardised mortality rates and infant mortality rates. The government structure variables are the nature of the policy process, the number of teaching hospitals, the total number of staff and the influence of senior levels of government.

This chapter has three basic concerns insofar as the independent variables are concerned. The initial focus is upon the identification of the type of policy-

making process which is characteristic of Health Boards and their predecessors in Scotland. The analysis undertaken to identify the process should allow us to come to some conclusions regarding the argument presented by our generalisations previously. [1] The second emphasis of this chapter is to describe the variation involved for each of the independent variables for which statistical data is available. It is essential to establish whether or not variation exists within each of these variables. If there is no variation, then clearly, the policy model must be assumed to be faulty. Finally, it is important that we assess the extent of the inter-relationships between at least some of the independent variables where possible. If the variables are inter-related, then partial correlation techniques will have to be applied at a later date to control for the effects of possible intervening variables. This analysis also allows us to examine the validity of the hypotheses regarding the relationships between socio-economic variables and health status indicators which were discussed in a previous chapter. [2]

The Nature of the Policy-Making Process:

In the policy model, it was argued that the policy-making process which was prevalent in the Scottish Health Service had an important effect on

the nature of the policy outputs and outcomes. In the development of our model we suggested that the policy process would fit into one of two basic categories. Brotherston [3] and Hunter [4] had both described aspects of policy-making within the Scottish Health Service as taking the form of incrementalism. The work of Mooney described the introduction of a particular form of economically rational policy-making - programme budgeting - in the Grampian Health Board's decision-making approach. [5]

The evidence available in the literature regarding the National Health Service in general, and in Scotland, in particular, strongly indicated that incrementalism was the dominant policy-making system. Accordingly, we generalised that the policy-making process of the Scottish Health Service was incrementalist.

In the Chapter which operationalised the concepts used in the study and which described the methodology which was to be applied in the course of the research, we argued that the nature of the policy-making approach was a function of the relationship between previous and current expenditures. The basic technique used is multiple regression which is based upon the simple formula $Y = a + bX$. In this formula, Y is the dependent variable, predicted expenditures; b is a constant by which all values of the independent variable X are

multiplied; a is a constant which is added to each case.

By conducting a regression on previous with current expenditures for all Health Boards combined, we obtained the values of our constants a and b. The descriptive statistics presented in Appendix C provided precise expenditures per 1,000 population. By using the constants obtained from the general regression, we were able to calculate the estimated values of Y for each Health Board for 1961, 1971 and 1976.

We then compared the predicted value of expenditures for those years with the actual spending rates. Sharkansky argued that if the predicted values of expenditures was within 15% of the actual values, one could safely claim that the pattern of expenditure decision-making over time was incrementalist. [6]

The policy model provided for 10 policy outputs. Only 8 are suitable for the type of analysis described above. Unfortunately, it was impossible to obtain data regarding community health expenditures by Health Board for 1951, 1961 and 1971. As a result, total expenditures and community health service expenditures have been excluded.

Table VII-1 summarises much of the relevant information needed to come to some conclusions on this matter. [7] It demonstrates the existence of two distinct decision-making patterns in operation during

the 1951 to 1976 period.

Table VII-1

Actual Expenditures, Successful Predictions and Percentage Incrementalist Decisions 1961 - 1976

Year	Number of Decisions	Successful Predictions	Percent Incrementalist
1976	117	100	85.5
1971	117	92	78.6
1961	117	38	32.5

From 1961 to 1976 the Table demonstrates the presence of an incrementalist pattern. During the 1961 to 1971 interval, 78.6% of the predicted 1971 expenditures' decisions fall within 15% of the actual expenditure outputs. In the 1971 to 1976 period, the successful prediction rate increases to 85.5%. It is logical that the 1976 success rate should be higher than the 1971 rate because of the shorter time interval of five years in the former case, as compared with ten years in the latter case. It is also interesting to note that this incrementalist pattern continues throughout the period despite the introduction of a number of different resource allocation schemes by the Scottish Home and Health Department during the period.[8]

The 1961 predictions indicate strongly that a non-incrementalist policy-making process was in

existence from 1951 to 1961. Why this period should demonstrate such a different process from that of the following intervals posed some difficulties at first. There seemed to be two possible explanations.

The simplest explanation is that the period begins very shortly after the introduction of the National Health Service. Because of this there are no previous expenditure guidelines to assist policy-makers in their work. As the Working Party on Revenue Resource Allocation points out, " with the introduction of the National Health Service in 1948, a whole range of entirely new funding and accounting problems came into being which had never been experienced before ".[8] On this basis, one might conclude that, in at least the first few years of this period, non-incrementalism had to be the rule rather than the exception.

A second related explanation suggests that the results of the regression analysis are misleading because of the base year - 1951 - used to calculate the constants. The Interim Report argues that it was not until the " middle 1950's "[9] that a suitable financial allocation scheme was devised for the Scottish Health Service. It may well be that in the first half of the decade, a non-incrementalist approach was common, but by the last half of the 1950's precedents and procedures had become sufficiently clear that an

incrementalist policy-making process was established.

Variation Within the Indendent Variables:

The basic premise of the policy model is that variation between Health Board Regions in terms of one or more variables categorised as socio-economic, health status or government structure variables explains much of the variation in the policy outputs and outcomes of Health Boards. This section of the chapter focusses upon the nature and extent of the variation between Health Boards insofar as the independent variables are concerned. Because previous expenditures (our operational measure of an incrementalist policy-making process) have been discussed in Chapter VI, no reference is made to this variable in this section.

By examining these variables in greater detail, we may be able to develop a better understanding of the nature of the differences between Health Board Regions. Such an examination of descriptive statistics may indicate the presence of certain patterns and change over time.

Income:

Table VII-2 provides a great deal of information about the growth and pattern of per capita income distribution between Health Board Regions over time. One of the most interesting characteristics of the pattern of income distribution is that it appears to

be relatively homogeneous. The coefficient of variation ranges from a low of 2.684 in 1961 to a high value of 9.293 in 1971.

Table VII-2

Income by Health Board 1951 - 1976
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	9	7	1	4
Ayrshire and Arran	7	11	6	6
Borders	6	2	5	7
Dumfries and Galloway	8	4	7	2
Fife	11	10	10	1
Forth Valley	10	9	4	13
Grampian	4	8	12	3
Greater Glasgow	3	6	8	9
Highland	12	13	11	12
Lanark	2	5	9	10
Lothian	1	1	2	5
Orkney	14	12	15	15
Shetland	15	12	14	14
Tayside	5	3	3	8
Western Isles	13	12	13	11
Coefficient of Variation	7.363	2.684	9.293	8.564

In terms of rates of growth, there are some differences between regions. In 1951, the highest

average per capita income of a Health Board Region was £403.93. [11] By 1976, this figure had increased to £2,979.16 - an increase of slightly over 737%. The lowest per capita income of a region in 1951 was £293.56. By 1976, this had increased by slightly over 850% to £2,500. This indicates that the growth rate is greater for those areas which were poorest in 1951.

Two factors case doubt on this conclusion. The first is that the coefficient of variation in 1976 is greater than it was in 1951. This indicates that the income differences between regions were greater in 1976 than they were in 1951. The second factor is the eclectic nature of income growth in Scottish Health Board Regions during this period. The Table demonstrates that in 1951 Fife ranked eleventh. By 1971, it ranked tenth, but in 1976 Fife enjoyed the highest per capita income level of all regions.

Income distribution follows only two consistent patterns during the period under investigation. The differences between regions remain relatively small. In all cases, there are large increases in the average per capita income levels of Health Board Regions from 1951 to 1976.

Industrialisation:

Unlike income distribution, the degree of industrialisation maintains several consistent patterns

over time. These patterns include growth, rank and the degree of variation between Health Board Regions.

Table VII-3

Industrialisation by Health Board 1951-1976
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	4	4	4	4
Ayrshire and Arran	7	6	7	7
Borders	13	11	12	10
Dumfries and Galloway	12	13	14	15
Fife	6	5	6	6
Forth Valley	5	4	5	5
Grampian	9	10	10	12
Greater Glasgow	1	1	1	1
Highland	11	9	9	9
Lanark	2	2	2	2
Lothian	3	3	3	3
Orkney	15	14	13	13
Shetland	14	12	15	14
Tayside	8	7	8	8
Western Isles	10	8	11	11
Coefficient of Variation	16.300	11.061	5.299	3.709

Table VII-3 indicates the pattern of growth in the percentage of the labour force engaged in secondary and tertiary employment as well as primary

industry, other than fishing, forestry or agriculture. The Greater Glasgow workforce which was 98.4% industrial in 1951, experienced an increase of slightly over 1.2% to 99.6% industrial workers by 1976. Orkney, which had the least industrialised workforce of 51.4% in 1951, underwent a 78.2% change so that by 1976, 91.6% of the Orkney workforce was engaged in industrial occupations. [12] The decline in the value of the coefficient of variation provides support for such a conclusion.

A consistent pattern also occurs when one examines the degree of industrialisation homogeneity between Health Board Regions from 1951 to 1976. Throughout the entire period, the differences between regions remain relatively small. The coefficient of variation ranges from a high value of 16.3 in 1951 to a low value of 3.709 in 1976. The differences between regions decline progressively over time, because at each succeeding interval there is a decrease in the extent of variation between regions.

The third type of consistency is even more remarkable. There is very little change in the rank of individual Health Boards over time. As the Table demonstrates, the five most highly ranked regions of 1951 remain at the top of the Table in 1976. Similarly, the five bottom ranked regions of 1951 maintain that status in 1961, 1971 and 1976.

Urbanisation:

Table VII-4

Urbanisation by Health Board 1951-1976
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	7	7	7	7
Ayrshire and Arran	5	5	5	5
Borders	10	11	11	11
Dumfries and Galloway	11	10	10	10
Fife	3	3	4	4
Forth Valley	6	6	6	6
Grampian	9	9	9	9
Greater Glasgow	1	1	1	1
Highland	15	15	15	15
Lanark	4	4	3	3
Lothian	2	2	2	2
Orkney	12	12	12	12
Shetland	13	13	13	13
Tayside	8	8	8	8
Western Isles	14	14	14	14
Coefficient of Variation	245.411	244.938	231.717	219.891

The pattern of urbanisation closely approximates the industrialisation pattern as Table VII-4 demonstrates. The Table also shows one major exception to this similarity.

The variation in the degree of urbanisation between Health Board Regions is enormous and remains so over time. Table VII-4 indicates that in 1951 the coefficient of variation is 245.411. By 1976, the coefficient's value declines slightly to 219.891.

Like the industrialisation pattern, however, the urbanisation trend is a constant one throughout the period. Although there is a large degree of variation at each interval, the Table demonstrates a reduction in the value of the coefficient of variation each time.

At first glance there appear to be important differences between the patterns of growth for urbanisation and industrialisation. As Appendix E demonstrates, the Greater Glasgow Health Board Region which had a population density of 2,362.2 people per 100 hectares in 1951, experiences a loss of population such that, by 1976, the population density for the area was 1,970.23 persons per 100 hectares. This is somewhat misleading since all of the other areas in the most densely populated third of the Health Board Regions experience population growth during the period. Lothian Health Board Region, for example, experiences an increase of slightly more than 8% in population density from 1951 to 1976.[12]

Those areas which were the least densely populated in 1951 appear to have experienced somewhat higher growth rates. In 1951, the population of the Highland

Health Board Region was 6.48 persons per 100 hectares; by 1976, this figure is 7.42 - an increase of slightly over 14.5%. Such a finding coincides with the gradual reduction in the extent of variation described above.

One very obvious similarity between the urbanisation and industrialisation patterns becomes clear when one examines Table VII-4. The ranking of Health Boards in terms of urbanisation in 1951 is virtually the same in 1976. The five Health Board Regions which were the most densely populated in 1951 are still the most densely populated in 1976. The five least densely populated regions of 1951 retain this status with the exception of Dumfries and Galloway.

The urbanisation process is characterised by more rapid growth rates on the part of the least densely populated areas. The relationships in terms of rank between Health Board urbanisation is quite stable. There is a gradual reduction in the degree of variation in population density between Health Board Regions, but the differences remain very large even in 1976.

Total Health Board Staff:

Although data regarding the number of total staff is available in acceptable form only for 1971 and 1976, Table VII-5 does indicates that there is considerable variation in the total number of Health Service staff per 10,000 population between Health Boards. In 1971, V is 21.424. By 1976, this has increased

to a value of 24.441.

Table VII-5

Total Health Board Staff by Health Board 1971 - 1976
Rank Order

Health Board	Year 1971	1976
Argyll and Clyde	8	8
Ayrshire and Arran	14	14
Borders	9	9
Dumfries and Galloway	7	4
Fife	10	10
Forth Valley	6	7
Grampian	4	5
Greater Glasgow	3	2
Highland	5	6
Lanark	12	12
Lothian	2	3
Orkney	11	13
Shetland	13	11
Tayside	1	1
Western Isles	15	15
Coefficient of Variation	21.424	24.441

Table E-4 in Appendix E indicates that there is a difference in the rates of growth in the number of health service staff per 10,000 for Health Boards during the period. Tayside, which ranked first in 1971,

experiences a growth rate of 30.42% during the period. Western Isles, which ranked fifteenth in 1971, experiences a slightly lower growth rate of 28.63%. It appears that the more highly staffed Health Boards underwent a greater rate of staffing increase than did the other Boards. This conclusion is supported by the increase in the value of V from 1971 to 1976.

As Table VII-5 indicates, the pattern of total staff per 10,000 population is a relatively stable one. Those five Health Boards which constitute the bottom third of the rankings in 1971 maintain this status in 1976. The five Health Boards which formed the top third in 1971 remain in the top positions in 1976 with one exception. The Highland Health Board drops one position from five to six while the Dumfries and Galloway Health Board improves its relative position from seven in 1971 to four in 1976.

Number of Teaching Hospitals:

Table VII-6 indicates an astounding degree of variation in the number of teaching hospitals per 10,000 population between Health Boards. The coefficients of variation for 1951, 1961, 1971 and 1976, respectively, are 147.06, 147.22, 148.65 and 141.46. The reduction in the value of V for 1976 after slight but consistent growth from 1951 to 1971 is explained by the elevation in status of the Royal Alexandra Hospital

in the Argyll and Clyde Health Board Region to that of a general hospital with some teaching units. [13]

Table VII-6

Number of Teaching Hospitals by Health Board 1951-1976 Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	7	7	7	7
Ayrshire and Arran	7	7	7	8
Borders	7	7	7	8
Dumfries and Galloway	5	5	5	5
Fife	6	6	6	6
Forth Valley	7	7	7	8
Grampian	2	2	2	2
Greater Glasgow	4	4	3	3
Highland	7	7	7	8
Lanark	7	7	7	8
Lothian	1	1	1	1
Orkney	7	7	7	8
Shetland	7	7	7	8
Tayside	3	3	4	4
Western Isles	7	7	7	8
Coefficient of Variation	147.06	147.22	148.65	141.46

The rates of growth indicate differences between Health Boards as well. Lothian Health Board experiences an increase of 8.9% in the number of teaching hospitals

per 10,000 population during the period 1951 to 1976. The Western Isles Health Board and several others, as Appendix E demonstrates, experience no growth at all. Although the growth rates for those Health Boards at the top of the rankings are greater than those at the bottom, the value of V declined in 1976 for the reason indicated above.

The pattern of ranking indicated by Table VII-6 is a very stable one over time. There is no change at all in the ranking of any Health Board before 1971. The inclusion of a seventh Health Board with a teaching hospital by 1976 does have the general effect of forcing all non-teaching hospital Health Boards to drop in rank from seven to eight.

Crude Death Rates:

The data in Table VII-7 indicate that there has been some variation in crude death rates between regions and also demonstrate that it has not been too extreme. The values of the coefficient of variation range from a high value of 12.853 in 1961 to a low value of 10.358 in 1971. One indication of a pattern over time is the drop in the extent of variation being followed by an increase for the succeeding interval.

The rates of growth also indicate differences between Health Board Regions. In the 1951 to 1976

Table VII-7

Crude Death Rates by Health Board 1951-1976
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	8	7	4	5
Ayrshire and Arran	4	5	7	8
Borders	12	12	13	13
Dumfries and Galloway	6	14	10	7
Fife	3	2	2	3
Forth Valley	1	1	1	2
Grampian	2	2	3	4
Greater Glasgow	5	3	5	11
Highland	11	9	9	10
Lanark	5	4	6	1
Lothian	7	6	5	4
Orkney	13	11	12	9
Shetland	14	13	14	12
Tayside	9	8	8	6
Western Isles	10	10	11	14
Coefficient of Variation	12.085	12.853	10.358	11.223

period, Forth Valley, the highest ranked Health Board of 1951, achieved a decline of approximately 1.7% in its crude death rate. Shetland, the lowest ranked area of 1951, attained a decline of approximately 27% during the same period. It appears that those areas with high crude death rates in 1951 have been able to reduce

these rates more rapidly than those regions with lower crude death rates. The decline in the value of V from 1951 to 1976 supports such a conclusion.

Table VII-7 also indicates that despite the differences in the rates of growth of crude death rates between Health Board Regions, the relative status of Health Boards has been quite stable. Three of the five top ranked Health Boards in 1951 maintain this position in 1976. Four of the five bottom ranked Health Boards of 1951 remain in the bottom third by 1976.

Standard Mortality Rates:

The information provided in Table VII-8 suggests that there has been some variation in standardised mortality rates between regions and it also indicates that since 1961, the differentiation has not been too extreme. The value of the coefficient of variation ranges from a high value of 29.421 in 1951 to its lowest value of 8.467 in 1976. The changes in the value of V over time indicate a continuing reduction in the extent of the variation between Health Board Regions.[15]

The rates of growth indicate differences between Health Board Regions. Orkney, which ranked first in 1951, experiences a decline of approximately 2% in its standardised mortality rate by 1976. Lanark, the lowest ranked Health Board of 1951, achieves a reduction

Table VII-8

Standardised Mortality Rates by Health Board 1951-1976
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	10	9	7	9
Ayrshire and Arran	8	9	9	10
Borders	10	10	8	3
Dumfries and Galloway	5	7	10	6
Fife	6	7	6	6
Forth Valley	7	7	6	7
Grampian	4	5	4	2
Greater Glasgow	11	11	11	11
Highland	3	2	2	8
Lanark	12	12	12	12
Lothian	9	8	7	6
Orkney	1	4	3	1
Shetland	5	3	1	5
Tayside	8	6	5	4
Western Isles	2	1	1	4
Coefficient of Variation	29.411	9.565	9.500	8.467

in its standardised mortality rates of approximately 4%. This suggests that those areas with higher standardised mortality rates in 1951 have been able to reduce these rates more drastically than those regions which had lower standardised mortality rates. [16] The

decline in the value of V from 1951 to 1976 supports such a conclusion.

Table VII-8 also indicates that the relative positions of Health Board Regions insofar as standardised mortality rates are concerned have been reasonably stable over time. Four of the five top ranked Health Boards of 1951 maintain this status in 1976. Three of the five bottom ranked Health Boards of 1951 remain in the bottom third of the rankings by 1976.

Infant Mortality Rates:

Table VII-9 presents a rather different image in the case of infant mortality rates as compared to the other two health status indicators. The data indicate that there has been considerable variation over time. The value of the coefficient of variation ranges from a low value of 21.080 in 1951 to a high value of 33.563 in 1976. The changes in the value of V over time indicate a continuing increase in the extent of variation between Health Board Regions.

The rates of growth also demonstrate differences between Health Board Regions. Shetland, which ranked first in 1951, experiences a decline of 85% in its infant mortality rate by 1976. Lanark, the lowest ranked Health Board of 1951, achieves a decline of only 64% by 1976. This suggests that those areas with lower

Table VII-9

Infant Mortality Rates by Health Board 1951-1976
Rank Order

Health Board	Year 1951	1961	1971	1976
Argyll and Clyde	10	10	11	10
Ayrshire and Arran	11	13	9	10
Borders	8	11	6	2
Dumfries and Galloway	12	3	7	6
Fife	9	9	9	5
Forth Valley	8	12	12	8
Grampian	4	6	3	5
Greater Glasgow	13	14	13	9
Highland	6	4	4	7
Lanark	14	15	14	8
Lothian	3	8	10	7
Orkney	2	1	1	3
Shetland	1	2	2	1
Tayside	7	7	8	4
Western Isles	5	5	5	7
Coefficient of Variation	21.080	31.791	33.452	331563

infant mortality rates in 1951 have been able to reduce these rates more drastically than those regions with higher infant mortality rates. The increase in the value of V from 1951 to 1976 supports such a conclusion.

Table VII-9 also indicates that the relative

positions of Health Board Regions insofar as infant mortality rates are concerned has been quite stable over time. Three of the five top ranked Health Boards of 1951 maintain this status in 1976. Four of the five bottom ranked Health Boards of 1951 remain in the bottom third of the rankings in 1976.

Socio-Economic Variables and Health Status:

In this section of the chapter we examine some of the relationships between health status and socio-economic variables. There are two reasons for doing this. In general terms, this type of analysis should indicate if at least some of the independent variables are correlated strongly with each other. If strong inter-correlation does exist, then in subsequent examination of the relationships between independent and dependent variables, the need to apply partial correlation techniques to control for the effects of intervening independent variables will have been demonstrated. In Chapter IV several hypotheses regarding the existence of relationships between socio-economic and health status factors were presented.[17] This section allows us to test these hypotheses regarding the relationships between income, urbanisation, industrialisation and region and crude death rates, standardised mortality rates and infant mortality rates.

Income and Health Status:

Table VII-10

Health Status by Income 1951-1976
Significant Correlations

Health Status Variable	Income
Crude Death Rate	-2
Standardised Mortality Rate	2
Infant Mortality Rate	3

Table VII-10 provides much of the information need to come to some conclusion regarding the nature of the relationship between per capita income and our health status variables. The Table indicates that in 58% of the opportunities provided, income is correlated significantly with health status factors. On only 50% of the occasions is income significantly related to crude death rates and standardised mortality rates. In 75% of the possible relationships, income is related significantly with infant mortality rates.

In terms of the hypotheses suggested in Chapter IV, this evidence provides reasonable support for only one of the three relating to income and health status. It appears that income is related strongly to infant mortality rates. It is also apparent that the evidence is not sufficiently powerful for us to state confidently that income is related significantly with either standardised mortality rates

The Table also indicates a very different pattern in terms of the relationships between income and the health status variables. In all cases, income is negatively related with crude death rates. This finding is in keeping with the literature on this subject. In all cases, income is positively related to both standardised and infant mortality rates. This is surprising in view of the commonly held beliefs on this subject. Clearly, this is a situation which deserves more discussion at the end of this section.

Urbanisation and Health Status:

Table VII-11

Health Status by Urbanisation 1951-1976
Significant Correlations

Health Status Variable	Urbanisation
Crude Death Rate	0
Standardised Mortality Rate	2
Infant Mortality Rate	1

Table VII-11 provides a summary of the information required to come to some conclusions regarding the relationship between urbanisation and health status. The data in the Table indicate that in only 25% of the opportunities has urbanisation correlated significantly with health status. Population density is not correlated significantly with crude death rates on any occasion. It is related strongly to standardised mortality rates

on only two of four possible opportunities. Urbanisation is related significantly with infant mortality rates on only one of four possible occasions.

In terms of the hypotheses presented in Chapter IV, this evidence is not sufficiently strong to support and of the three suggested relationships. Urbanisation does not appear to be related strongly with crude death rates standardised mortality rates of infant mortality rates.

The pattern of relationships between urbanisation and health status appears to be similar to that of income and health status. Urbanisation is related negatively to crude death rates on three of four occasions. It consistently correlates positively with standardised mortality and infant mortality rates.

Industrialisation and Health Status:

Table VII-12

Health Status by Industrialisation
1951 - 1976
Significant Correlations

Health Status Variable	Industrialisation
Crude Death Rate	-4
Standardised Mortality Rate	3
Infant Mortality Rate	4

Table VII-12 provides, in summary form, much of the data required to arrive a some conclusions

regarding the relationship between industrialisation and health status. The information in the Table indicates that in 91% of the opportunities, industrialisation is related significantly with health status. In 100% of the occasions, industrialisation is correlated significantly with crude death rates. In 75% of the cases, industrialisation is related strongly with standardised mortality rates. In 100% of the cases, there is a significant relationship between industrialisation and infant mortality rates.

In terms of the hypotheses presented in Chapter IV, the evidence provides strong support for all three. Industrialisation appears to be related strongly to crude death rates, standardised mortality rates and infant mortality rates.

Despite the differences between industrialisation and the other two socio-economic variables examined thus far in terms of the strength of the relationships between these variables and health status, the pattern described earlier remains similar. On every occasion, industrialisation is related negatively with crude death rates. On every opportunity, industrialisation is related positively with standardised and infant mortality rates.

Region and Health Status:

Table VII-13 provides much of the available evidence regarding the relationship between mortality

and region. Because region is a nominal level variable, analysis of variance is the statistical technique used and the F scores are provided in Appendix F.

Table VII-13

Health Status by Region 1951-1976
Significant Correlations

Health Status Variable	Region
Crude Death Rate	1
Standardised Mortality Rate	2
Infant Mortality Rate	3

The data in the Table indicate that in 25% of the opportunities, region is related significantly to crude death rates. In 50% of the cases, region is correlated significantly with standardised mortality rates. In 75% of the opportunities, there is a strong statistical relationship between infant mortality rates and region.

In terms of the hypotheses presented in Chapter IV, the evidence provides support for only one of the three. It appears that there is a strong relationship between region and infant mortality rates. The evidence does not provide sufficient confidence to allow us to conclude that the same type of relationship exists between region and crude death rates and standardised mortality rates.

Unfortunately, because of the statistical

techniques employed, it is impossible to determine if the same type of pattern as was found with the three other socio-economic variables and health status factors exists in the case of region. It is not clear whether there is a change in the nature of the relationship between region and mortality in terms of the direction of the correlations which do exist.

The evidence in this section raises two types of questions. The first of these related to the way in which the three quantitative socio-economic variables relate differently to crude death rates than they do to standardised and infant mortality rates. The second concerns itself with the fact that many of the original hypotheses regarding the relationships between the socio-economic variables and health status variables are not supported by the evidence presented in the chapter.

In terms of the first question, the analysis presented above indicates that socio-economic variables are related negatively with crude death rates and positively with standardised and infant mortality rates. It appears that the lack of inter-correlation between these three health status factors which has been discussed by Culyer, may be evident in Scotland as well.[18]

Table VII-14

Health Status Variables 1951 - 1976
Significant Correlations

	Crude Death Rate	Standardised Mortality Rate	Infant Mortality Rate
Crude Death Rate		-1	-3
Standardised Mortality Rate	-1		4
Infant Mortality Rate	-3	4	

Table VII-14 indicates the nature of the significant relationships between the three health status variables. It shows that crude death rates are correlated significantly with standardised mortality rates on only one of four occasions. Although crude death rates are related with infant mortality rates 75% of the time, the relationship is an inverse one. As crude death rates increase, infant mortality rates decrease. In the case of standardised and infant mortality rates, significant positive correlations exist on all occasions examined.

The differences also apply to the pattern of ranking of Health Boards by health status indicator. The data presented in Table VII-15 indicate this clearly.

The Table shows that Health Board rank in terms of crude death rates is unrelated to Health

Table VII-15

Health Status Rankings by Health Board 1951-1976
Significant Spearman's rho Correlations

	Crude Death Rates	Standardised Mortality Rates	Infant Mortality Rates
Crude Death Rates		0	-3
Standardised Mortality Rates	0		4
Infant Mortality Rates	-3	4	

Board ranking by standardised mortality rates. 75% of the time crude death rankings by Health Board are inversely related to infant mortality rates expressed in terms of Health Board rankings. On every occasion, Health Board rankings by standardised mortality rates are correlated positively with Health Board rankings by infant mortality rates. This evidence and that cited immediately above provide evidence for two conclusions.

Clearly, in the case of Scotland, the image of health status or " need " is a function of the particular indicator used. In Scotland, crude death rates cannot be used as surrogates for standardised mortality rates or infant mortality rates. This reinforces our earlier argument regarding the need to use multiple indicators of need. In view of the Scottish Home and Health Department's apparent decision to use standardised

mortality rates as the basic indicator of need, a serious problem emerges because the standardised mortality rate bears no relationship to the actual mortality rate experienced in Scottish Health Board Regions.

Given the nature of the unexpected pattern of relationships between the health status variables, it is hardly surprising that the results of the analysis are not more in keeping with the hypotheses which deal with this matter. Despite this, some comment regarding income, urbanisation and region is called for because of the results obtained above.

It may be that infant mortality rates are more sensitive for fluctuations in income than the other two health status variables, and because the income variation between regions is rather slight, only the one significant relationship emerges. Also, it must be recognised that the within region income differences are probably much greater than the between region income differences. In other words, it is quite possible that if the appropriate mortality and income group data were available for each region, significant relationships between income and crude death and standardised mortality rates might occur. This, of course, would be more in keeping with the pattern found in the social class studies on the subject.[19]

The evidence presented indicates that population density, by itself, does not explain any of the variation in health status factors. MacIlwaine's work in Glasgow suggests that it is the presence of multiple deprivation in terms of housing, diet, income and other similar factors, which may be features of densely populated areas, that are more directly related to high mortality rates. [20] This certainly is the opinion of Carstairs and Patterson in their analysis of morbidity patterns in Scottish hospitals. [21]

The fact that region appears to be related significantly only to infant mortality rates in a consistent fashion is less surprising than originally anticipated. The Dewar and Cathcart Reports indicate that it is socio-economic factors, especially population density and income, which have presented unique health care problems in the Highlands. It may well be that the intervening effects of these other socio-economic variables have an impact upon the statistical relationships which apply between region and health status. By using analysis of covariance techniques to control for the other socio-economic variables, we find that region does not correlate significantly with any of the health status variables on more than 25% of the possible occasions.

Summary and Conclusion:

This chapter had three basic concerns: to

determine the nature of the policy-making process; to describe the extent and pattern of variation between regions in terms of the independent variables; to present an analysis of some aspects of the hypothesised relationships between socio-economic variables and health status variables.

In the first section of the chapter, the results of multiple regression analysis indicated the presence of an incrementalist policy-making approach by Scottish Health Boards from 1961 to 1976. The analysis also demonstrated a non-incrementalist pattern for the preceding decade which could be explained by the lack of experience and infrastructure during the initial years of the National Health Service in Scotland.

The second section of the chapter described the pattern and extent of the variation between Health Board Regions in terms of the quantitative independent variables. Many of the variables such as industrialisation and the number of teaching hospitals were ones for which great differences between regions were evident. For other variables, such as per capita income, the differences between regions were not so dramatic. It may well be that relatively minor differences in income, for example, may explain more of the variation in the dependent variables than is the case for

variables like industrialisation. In any event, the data demonstrate regional variation for all of our independent variables, and for that reason, the fundamental logic of the policy model remains plausible.

The final section of the chapter revealed a lack of simple relationships between crude death rates and standardised mortality rates and infant mortality rates. This finding cast doubt on the suitability of using a single indicator, such as standardised mortality rates, as the indicator of need for health policy-making in Scotland. Industrialisation was obviously the most strongly related to health status of the four socio-economic variables examined. The failure of income and urbanisation to meet all of the conditions required to lend credible support to the hypotheses was explained in terms of the small amount of variation in the case of income, and the need to look at multiple deprivation factors when assessing the impact of urbanisation. In the case of region, the evidence demonstrates that the intervening socio-economic variables explain the pattern which emerges.

Now that one of the independent variables has been clearly established and the examination of the independent variables indicates that the policy model developed in Chapter III remains logically plausible, we can turn our attention to an examination of the

relationships between the independent variables and the dependent variables.

Chapter VIII

The Relationship Between Individual Independent Variables and Policy Outputs and Policy Outcomes

Introduction:

This chapter has one major focus. In Chapter IV a number of hypotheses regarding the nature and existence of relationships between each of the independent variables and the policy outputs and outcomes were developed. In this section of the dissertation, we present the results of the analysis which was undertaken to test these hypotheses.

Initially, the basic statistical technique used is simple correlation. Because of the results obtained in the previous chapter and a logical concern about the possibility of intervening variables having some effect upon the statistical results achieved through the application of simple correlation techniques, partial correlation measures are used to control for the possible intervening variable effects. Because of the small size of the universe of this study, we control only for those variables which have indicated significant relationships when simple correlation coefficients are examined. Although this

approach encourages and, indeed, requires a cautious interpretation of the results, it does provide credibility to the statistical procedures employed.[1]

The specific statistical techniques used for all but one of the independent variable-dependent variable relationships are pearson correlation and partial correlation. In the case of region, analysis of variance and analysis of covariance techniques are applied.

In order to make the chapter somewhat easier to read, only tables relating to the 1976 data are presented in the text. The tables presenting the results of our analysis for the 1971, 1961 and 1951 data are included in Appendices H and G. If the pattern of results in the Appendices differ from that presented in the text, the differences are noted and discussed in the body of the chapter.

The policy model provides for three groups of independent variables. The socio-economic variables include per capita income, urbanisation, industrialisation and region. The health status variables are crude death rates, standardised mortality rates, and infant mortality rates. The three statistically defined government structure variables are the number of teaching hospitals, the total staff of Health Boards and the nature of the policy process defined

as previous expenditures. In the section which follows, the relationships between each of these variables and the policy outputs and outcomes is presented and discussed.

Income:

Table VIII-1

Income and Policy Outputs and Outcomes

Policy Variable	r	r^2
total beds/10,000	.2843	.08082
Psychiatric beds/10,000	.4871*	.23726
Chronic beds/10,000	-.7069*	.49970
General beds/10,000	.1221	.01490
Hospital doctors/10,000	.3732	.13927
Hospital nurses/10,000	.2975	.08850
General practitioners/10,000	-.7834*	.61371
Pharmacists' outlets/10,000	.5090*	.25908
Dentists/10,000	.7025*	.49350
Opticians/10,000	.4612*	.21270
Community Health Staff/10,000	-.5682*	.32285
Total expenditures/1,000	.1547	.02393
Hospital expenditures/1,000	.3005	.09030
General beds' expenditures	.2126	.04519
Psychiatric beds' exp./1,000	.5832*	.34012
Chronic beds' expenditures	-.7053*	.49774
General practitioner exp.	-.7736*	.59845
Dental expenditures/1,000	-.6455*	.41667
Pharmaceutical exp./1,000	.0549	.00301
Optical expenditures/1,000	-.1615	.02608
Community health exp./1,000	-.6098*	.37185

* Significant at p=0.05 level of significance

All of the research conducted in the U.S. indicated that income was strongly related to policy outputs. Even Sharkansky found significant simple correlations between income and expenditures. [2] On this basis we hypothesised that there was a significant

relationship between the average per capita income of a Health Board Region and the health policy outputs and outcomes of the region.

Table VIII-1 provides support for such an hypothesis. The data indicate that for 12 of the 21 possible cases, statistical significance is achieved. In a majority - 57% - of the cases, income is strongly related to health policy in Scotland.

The Table also indicates that income is more frequently significantly related to policy outcomes than policy outputs. In 7 of 11 possible pairings, income is significantly related to policy outcomes. In the case of policy outputs, statistical significance is achieved in only 5 of 10 possible pairings.

We also note that income is more frequently related strongly to non-hospital variables than to hospital variables. Income is strongly related to 8 of 10 non-hospital policy variables, but it is correlated strongly with 4 of 11 hospital policy variables. Although this pattern is maintained in 1971, it is altered drastically in 1961 and 1951.

The Table also indicates that in 50% of the cases, where a statistically significant relationship is found, the relationship is a negative one. Thus, income is negatively related with the number of chronic beds, the number of general practitioners, the number

of community health staff, chronic beds' expenditures and community health expenditures.

Explanation of these patterns is varied. It may be that in the poorer areas, there are relatively fewer hospital facilities, especially for acute and psychiatric care. It may be that the age distribution differences of the various regions explain the relationship with chronic beds. Finally, the existence of the Highlands and Islands Medical Scheme, in which the role of health visitors and general practitioners has been emphasised for a long time, may also be a major factor.

Urbanisation:

The research conducted by T. Dye and R. Hofferbert indicated a relationship between the degree of urbanisation of an area and the nature of the policy outputs in that area. [3] On this basis, it was hypothesised that there is a significant relationship between the level of urbanisation of a Health Board Region and the policy outputs and outcomes of the region.

Table VIII-2 indicates that this is not the case in Scotland. In only 6 of the possible pairings is there a significant relationship between urbanisation and health policy. Only 29% of the possibilities support the hypothesis.

Table VIII-2

Urbanisation and Policy Variables

Policy Variable	r	r^2
Total beds/10,000	.2993	.08958
Psychiatric beds/10,000	.1659	.02752
Chronic beds/10,000	-.2094	.04384
General beds/10,000	.5038*	.25381
Hospital doctors/10,000	.6270*	.39312
Hospital nurses/10,000	.4618*	.21325
General practitioners/10,000	-.0476	.00226
Pharmacists' outlets/10,000	.0367	.00134
Dentists/10,000	.3635	.13213
Opticians/10,000	.1994	.03976
Community health staff/10,000	-.1677	.02812
Total expenditures/1,000	.5252*	.27583
Hospital expenditures/1,000	.5609*	.31460
General beds' exp./1,000	.5944*	.35331
Psychiatric beds exp./1,000	.1283	.01646
Chronic beds' exp./1,000	-.0892	.00795
General practitioner exp.	-.3073	.09443
Dental expenditures/1,000	.3140	.09859
Pharmaceutical exp./1,000	.1506	.02268
Optical expenditures/1,000	.3113	.09690
Community health exp./1,000	-.2237	.05004

*
Significant at p=0.05 level of confidence

Urbanisation appears to be related significantly only to hospital variables. These are the number of general beds, the number of hospital doctors, the number of hospital nurses, total expenditures, hospital expenditures and general beds' expenditures. 1951 provides an example of a deviant case in terms of this pattern where the situation is reversed. The pattern remains constant from 1961 onwards.

This may reflect the growing importance of the district and teaching hospitals in the urban areas as the centres of acute care in Scotland. If this is the

case, it appears that urbanisation is related to health policy to the extent that it explains a significant percentage -21% to 39%- of the variation in acute hospital health policy in Scotland.

Industrialisation:

Table VIII-3

Industrialisation and Policy Variables

Policy Variables	r	r^2
Total beds/10,000	.2086	.04351
Psychiatric beds/10,000	.3442	.11847
Chronic beds/10,000	-.5007*	.25070
General beds/10,000	.1152	.01327
Hospital doctors/10,000	.3853	.14845
Hospital nurses/10,000	.2003	.04012
General practitioners/10,000	-.5474*	.29964
Pharmacists' outlets/10,000	.0002	.00000
Dentists/10,000	.5993*	.35916
Opticians/10,000	.4005	.16040
Community health staff/10,000	-.5644*	.31854
Total expenditures/1,000	.1495	.02235
Hospital expenditures/1,000	.2912	.08479
General beds' exp./1,000	.2389	.05707
Psychiatric beds' exp./1,000	.3165	.10017
Chronic beds' exp./1,000	-.3674	.13498
General practitioner exp.	-.7433*	.55249
dental expenditures/1,000	.5344*	.27499
Pharmaceutical exp./1,000	.2590	.06708
Optical expenditures/1,000	.0537	.00288
Community health exp./1,000	-.5815*	.33814

* Significant at p=0.05 level of confidence

R. Hofferbert and Dawson and Robinson found a strong relationship between industrialisation and public policy in their studies. [4] For this reason, it was hypothesised that there is a significant relationship between the level of industrialisation of a health

region and the health policy outputs and outcomes of the region.

The data in Table VIII-3 indicate that only in 7 of the 21 possible pairings was statistical significance achieved. In only 33% of the cases is the correlation sufficiently strong to be statistically meaningful.

Industrialisation tends to be more frequently related to policy outcomes than policy outputs. Table VIII-3 demonstrates that industrialisation correlates significantly with 4 of 11 policy outcomes, but with only 3 of 10 policy outputs.

The Table also indicates that industrialisation appears to be more frequently related to non-hospital variables. Industrialisation correlates significantly with only 1 of 11 hospital policy variables, but with 6 of 10 non-hospital policy variables.

The patterns which emerge regarding industrialisation and health policy are very similar to the patterns between income and health policy. This may reflect the interaction between the two variables which was described previously.

It may be that in many areas the rate of industrialisation has been quite high. If the policy process is incrementalist, then one would expect that the time lag in terms of the porivision of hospital facilities and staff would be greatest. The planning,

building and tendering procedures for hospitals tend to be more cumbersome than is the case for the erection of a surgery for a new general practitioner.

It appears, however, on the basis of the data provided in the Table, that industrialisation does not successfully explain health policy variation in Scotland.

Region:

Table VIII-4

Region and Policy Variables

Policy Variable	f
Total beds/10,000	.344
Psychiatric beds/10,000	3.282
Chronic beds/10,000	6.975*
General beds/10,000	.050
Hospital doctors/10,000	1.757
Hospital nurses/10,000	1.546
General practitioners/10,000	7.987*
Pharmacists' outlets/10,000	.885
Dentists/10,000	5.912*
Opticians/10,000	2.476
Community Health Staff/	15.551*
Total expenditures/1,000	.373
Hospital expenditures/1,000	1.527
General beds' exp./1,000	.543
Psychiatric beds' exp./1,000	4.106
Chronic beds' exp./1,000	4.121
General practitioner exp.	10.915*
Dental expenditures/1,000	9.058*
Pharmaceutical exp./1,000	5.134*
Optical expenditures/1,000	.052
Community health exp./1,000	13.368*

* Significant at p=0.05 level of confidence

The studies by Sharkansky all indicated that regional differences explained a great deal of the

variation in public policy in the U.S. In the Scottish Health Service, the Highlands and Islands Medical Scheme was a concrete manifestation of an attempted response for the unique medical care problems of one geographic region. For these reasons, it was hypothesised that region has a significant relationship with policy outputs and outcomes.

Table VIII-4 indicates that this is not the case. Only 8 of the 21 possible pairings are statistically significant. In only 38% of the cases are the F ratios sufficiently large for one to claim that region is significantly related to health policy in Scotland.

There is a very clear pattern in terms of the relationship between region and health policy. Region is significantly related to only 1 of 11 hospital variables, but it is statistically very strongly related to 7 of 10 non-hospital variables. This may reflect the success of the Highlands and Islands Medical Scheme in building up the primary and community care services during periods when hospital construction was limited by government capital expenditure restrictions.

The data do show that our original hypothesis is not supported. They also indicate that a revision is in order. It appears that region may be significantly related to non-hospital policy variables in Scotland.

Crude Death Rates:

Table VIII-5

Crude Death Rates and Policy Variables

Policy Variable	r	r^2
Total beds/10,000	-.2843	.08083
Psychiatric beds/10,000	-.5136*	.26378
Chronic beds/10,000	.5072*	.25725
General beds/10,000	.0998	.00996
Hospital doctors/10,000	-.1804	.03254
Hospital nurses/10,000	-.1451	.02105
General practitioners/10,000	.4199	.17632
Pharmacists' outlets/10,000	-.3545	.12567
Dentists/10,000	-.1215	.01476
Opticians/10,000	-.0910	.00828
Community health staff/10,000	.6290*	.39564
Total expenditures/1,000	-.0209	.00044
Hospital expenditures/1,000	-.1496	.02238
General beds' exp./1,000	.0035	.00001
Psychiatric beds' exp/1,000	-.5210*	.27144
Chronic beds' exp./1,000	.4423*	.19563
General practitioner exp/1,000	.5135*	.26368
Dental expenditures/1,000	-.5866*	.34409
Pharmaceutical exp./1,000	-.2170	.04700
Optical expenditures/1,000	.0914	.00835
Community health exp./1,000	.6092*	.37112

* significant at p=0.05 level of confidence

The policy model suggested that health policy-makers in Scotland might attempt to respond to more direct indicators of health status such as crude death rates by adjusting the resources which they provided for various health service purposes.[6] Accordingly, we hypothesised that crude death rates are related significantly to policy outputs and outcomes for Health Board Regions.

Table VIII-5 indicates that this is not the

case. Only in 8 of 21 possible pairings is there a significant relationship between crude death rates and health policy. Only 38% of the possibilities support such an hypothesis. Although the support for such an hypothesis reaches 50% of the pairings for 1971, it declines dramatically in 1961 and fails to achieve a reasonably large proportion of the possible relationships in 1951 as well.

Crude death rates appear to be as frequently related strongly to hospital as to non-hospital variables. With the exception of 1961, crude death rates are related significantly with 40% to 50% of the hospital related policy variables. In the case of non-hospital variables, with the exception of 1961, the range of strong relationships is from 36% to 50% of the total number of possibilities.

In those cases where there appear to be consistent relationships over time, chronic care and general practitioner policy outputs and outcome appear frequently. This may reflect the regional features of the Scottish Health Service in which the higher crude death rates seem to occur in the Highlands and Islands areas, and in which a larger percentage of the population tends to be older than is the case elsewhere in Scotland.

Standardised Mortality Rates:

It has been suggested recently that standardised

mortality rates are to be used as indicators of health need in Scotland for policy-making purposes. [7] For this reason, it was hypothesised that there was a strong relationship between standardised mortality rates and the policy outputs and outcomes of the Health Board Regions.

Table VIII-6

Standardised Mortality Rates and Policy Variables

Policy Variable	r	r^2
Total beds/10,000	.2230	.04972
Psychiatric beds/10,000	.3842	.14750
Chronic beds/10,000	-.3836	.14714
General beds/10,000	-.0384	.00147
Hospital doctors/10,000	.1853	.03433
Hospital nurses/10,000	.0785	.00616
General practitioners/10,000	-.5169*	.26718
Pharmacists' outlets/10,000	-.1200	.01440
Dentists/10,000	.3449	.11895
Opticians/10,000	-.0099	.00009
Community health staff/	-.4703*	.22118
Total expenditures/1,000	.0194	.00038
Hospital expenditures/1,000	.1370	.01876
General Beds' exp./1,000	.0269	.00072
Psychiatric beds' exp/1,000	.2785	.07756
Chronic beds' exp./1,000	-.3926	.15413
General practitioner exp.	-.6155*	.37884
Dental expenditures/1,000	.3621	.13116
Pharmaceutical exp./1,000	.0998	.00996
Optical expenditures/1,000	.1548	.02396
Community health exp/1,000	-.4479*	.20061

* Significant at p=0.05 level of confidence

Table VIII-6 indicates that this is not the case. Only in 4 of the 21 possible pairings is there a significant relationship between standardised mortality rates and health policy. Only 19% of the

possibilities support such an hypothesis.

Standardised mortality appears to be more frequently related to non-hospital policy variables than hospital variables. From 1951 to 1976, standardised mortality rates are related significantly with only 10% of the hospital policy variables. For the other hospital variables, the range of strong relationships is from 36% to 80% of the total number of possibilities.

The variables with which standardised mortality rates are consistently related tend to be the same ones as for crude death rates. This difference exists however. In the case of standardised mortality rates, the relationships are negative ones. This, of course, is a result of the inverse relationship which exists between crude death rates and standardised mortality rates in Scotland. The policy pattern may again be the result of regional patterns of health care provision and status.

Infant Mortality Rates:

In the past the Scottish Home and Health Department has expressed its concern about high infant mortality rates and has undertaken special studies of this matter.[8] For these reasons, we hypothesised that there is a significant relationship between infant mortality rates and the policy outputs and outcomes of the Health Board Regions.

Table VIII-7

Infant Mortality Rates and the Policy Variables

Policy Variable	r	r^2
Total beds/10,000	.2269	.05148
Psychiatric beds/10,000	.4441*	.19722
Chronic beds/10,000	-.6729*	.45279
General beds/10,000	.0542	.00293
Hospital doctors/10,000	.3119	.09728
Hospital nurses/10,000	.1200	.01440
General practitioners/10,000	-.4667*	.21780
Pharmacists' outlets/10,000	.0119	.00014
Dentists/10,000	.5701*	.32501
Opticians/10,000	.1070	.01144
Community health staff/10,000	-.4284	.18352
Total expenditures/1,000	.0721	.00519
Hospital expenditures/1,000	.1992	.03968
General beds' exp./1,000	.1314	.01726
Psychiatric beds' exp./1,000	.3766	.14182
Chronic beds' exp./1,000	-.6080*	.36966
General practitioner exp.	-.6103*	.37246
Dental expenditures/1,000	.3493	.12201
Pharmaceutical exp./1,000	.2983	.08898
Optical expenditures/1,000	-.2246	.05044
Community health exp./1,000	-.5329*	.28398

*
Significant at $p \leq 0.05$ level of confidence

Table VIII-7 indicates that this is not the case. In only 7 of 21 possible pairings is there a significant relationship between infant mortality rates and health policy in 1976. Only 33% of the possibilities support such an hypothesis.

Infant mortality rates appear to be more frequently related to non-hospital variables. From 1951 to 1976, infant mortality rates are related strongly with only 0% to 40% of the hospital policy variables. For the other policy variables the range of strong relationships is from 33% to 67% of the total

number of possibilities.

The policy variables with which infant mortality rates are consistently related include the same ones as for standardised mortality rates and crude death rates. The pattern of relationships is similar to that found with standardised mortality rates and reflects the strong positive relationship which exists between these two health status indicators. This evidence does suggest again that the pattern may be a result of the regional patterns of health care provision and health status.

Total Staff:

Sharkansky found that the size of the staffing levels had a strong positive relationship with policy outputs. The influence of the bureaucratic inputs reflects the desire of all organisations to survive and grow over time. Anthony Downs has described this process well.[9] For these reasons, we hypothesised that there would be a significant statistical relationship between the number of regional Health Board employees per population and the public policy outputs and outcomes of the region.

Table VIII-8 supports such an hypothesis. It demonstrates that 12 of the 21 possible pairings are statistically significant. In 57% of the cases the correlation coefficients were strong enough to indicate a significant relationship between staffing

and policy. In the 12 cases the relationships are consistently positive and r^2 values indicate that staffing levels explain between 28% and 99% of the policy variation between regions.

Table VIII-8

Policy Variables by Total Staff

Policy Variable	r	r^2
Total beds/10,000	.8626*	.74407
Psychiatric beds/10,000	.6224*	.38738
Chronic beds/10,000	-.3417	.11675
General beds/10,000	.9056*	.82011
Hospital doctors/10,000	.9421*	.88755
Hospital nurses/10,000	.9950*	.99002
General practitioners/10,000	-.0942	.00887
Pharmacists' outlets/10,000	.4212	.17740
Dentists/10,000	.5581*	.31147
Opticians/10,000	.5326*	.28366
Community health staff/10,000	-.3562	.12687
Total expenditures/1,000	.9715*	.94381
Hospital expenditures/1,000	.9914*	.98287
General beds' exp./1,000	.9471*	.89699
Psychiatric beds' exp./1,000	.6956*	.49385
Chronic beds' exp./1,000	-.1805	.03258
General practitioner exp.	-.3071	.09431
Dental expenditures/1,000	.6561*	.43046
Pharmaceutical exp./1,000	-.1277	.01630
Opticians' exp./1,000	.0228	.00051
Community health exp./1,000	-.3669	.13461

* Significant at p=0.05 level of confidence

Staffing levels are more frequently related to policy outcomes than policy outputs. In terms of policy outcomes, the correlation coefficients are statistically strongly related in 7 of 11 cases. This occurs only 5 of the 10 times insofar as policy outputs are concerned.

An even more distinctive pattern emerges in

terms of hospital and non-hospital policy variables. Staffing levels are significantly related to 8 of 10 hospital variables, but only to 4 of 11 non-hospital variables. This may reflect the labour intensive nature of hospital care and the fact that hospital personnel constitute a large majority of the Health Board staff. Because of this majority position, their influence may be greater in obtaining additional resources for hospitals than is the case of staff involved in other health care sectors.

In general, the simple correlation coefficients support the original hypothesis. They also indicate that staffing levels are more likely to be strongly related to hospital policy than to non-hospital policy.

Teaching Hospitals:

In previous chapters we have indicated the very important role of the teaching hospitals in the health care system of Scotland. The Working Party on Revenue Resource Allocation recently indicated that teaching hospitals deserved special attention in terms of funding. [10] For these reasons the number of teaching hospitals was considered to be an important structural factor in our model and we hypothesised that there would be a significant statistical relationship between the number of teaching hospitals per population and the policy outputs and outcomes of the regions.

Table VIII-9

Teaching Hospitals with Policy Variables

Policy Variable	r	r^2
Total beds/10,000	.4659*	.21706
Psychiatric beds/10,000	.3030	.09180
Chronic beds/10,000	-.4026	.16208
General beds/10,000	.7354*	.54081
Hospital doctors/10,000	.8116*	.65869
Hospital nurses/10,000	.6771*	.45869
General practitioners/10,000	-.1027	.01054
Pharmacists' outlets/10,000	.5401*	.29170
Dentists/10,000	.5504*	.30294
Opticians/10,000	.6599*	.43546
Community health staff/10,000	-.2214	.04901
Total expenditures/1,000	.6952*	.48330
Hospital expenditures/1,000	.7239*	.52403
General beds' exp./1,000	.7799*	.60824
Psychiatric beds' exp/1,000	.4262	.18164
Chronic beds' exp./1,000	-.2651	.07027
General practitioner exp/1,000	-.3064	.09388
Dental expenditures/1,000	.5970*	.35640
Pharmaceutical exp./1,000	-.0150	.00022
Optical expenditures/1,000	.0357	.00127
Community health exp./1,000	-.3237	.10478

*
Significant at p=0.05 level of confidence

The data in Table VIII-9 tend to support such a conclusion. Of 21 possible pairings, 11 proved to be significantly related. In 52% of the cases, the relationship between teaching hospitals and health policy is strong. In each of these cases, the relationship is a positive one.

The Table also indicates that teaching hospitals are slightly more likely to be strongly related to hospital policy. Of 11 hospital variables, teaching hospitals correlated significantly with 6. It correlated strongly with 5 of the 10 non-hospital policy variables.

This pattern is logical in that one would assume that a hospital-related independent variable would have greater impact upon hospital-related dependent variables.

The number of teaching hospitals also tended to correlate significantly more frequently with policy outcome variables than with policy output variables. This variable was strongly related with 7 of 11 policy outcome variables, but to only 4 of 10 policy output variables. The difference is explained by the relationships between teaching hospitals and the number of pharmacists' outlets, the number of dentists and the number of opticians. This might result from a tendency on the part of such health care practitioners to locate themselves close to the areas in which they were trained. It might also result from the impact of intervening variables.

In general terms, the data presented support our hypothesis. They suggest that a revision might be in order. The number of teaching hospitals per population might be strongly related to policy outcomes.

The Policy Process:

This variable involved two different concepts. By relating current expenditures with previous expenditures, we were able to determine if the policy process was incrementalist.

Table VIII-10

Policy Variable by the Policy Process

Policy Variable	r	r^2
Total beds/10,000	.8811*	.77833
Psychiatric beds/10,000	.9580*	.91776
Chronic beds/10,000	.7085*	.50197
General beds/10,000	.9527*	.90763
Hospital doctors/10,000	.9366*	.87721
Hospital nurses/10,000	.9575*	.91680
General practitioners/10,000	.8765*	.76825
Pharmacists' outlets/10,000	-.1618	.02617
Dentists/10,000	.8096*	.65545
Opticians/10,000	.0039	.00001
Hospital expenditures/10,000	.9732*	.94711
General beds' exp/1,000	.9501*	.90269
Psychiatric beds' exp./1,000	.9892*	.97851
Chronic beds' exp/1,000	.7243*	.52620
General practitioner exp/1,000	.9461*	.89510
Dental expenditures/1,000	.8959*	.80263
Pharmaceutical exp./1,000	.5422*	.29398
Optical expenditures/1,000	.9163*	.83960

* Significant to $p=0.05$ level of confidence

We found in Table VIII-10 that 8 of 8 possible pairings between health service expenditures in 1971 and 1976 are significantly related. Previous expenditures explained between 29% and 97% of the variation in current expenditures. On this basis, we again concluded that the policy process was incrementalist.

The second aspect of the variable involves the relationship between previous expenditures and public policy variables. Sharkansky found this to be the most important relationship. Brotherston and Hunter have argued that this is the basis of planning in the Scottish Health Service. For these reasons, we hypothesised that there would be a significant statistical

relationship between the policy process and public policy outputs and outcomes.

The data in Table VIII-10 indicate that in 16 of 18 possible pairings, the correlation coefficient is statistically significant. This means that in 88% of the cases, the policy process successfully explains variation in policy outputs and outcomes in the Scottish Health Service. The significant correlations are all positive and indicate that the policy process explains between 29% and 97% of the variation in policy outputs and policy outcomes.

Previous expenditures (the policy process) appear to be strongly related to policy outputs more frequently than to policy outcomes. They are significantly related to 100% of the policy outputs and 75% of the policy outcomes. This evidence provides rather strong support for the original hypothesis.[11]

Partial Correlation:

One of the difficulties involved in attempting to come to any meaningful conclusions about the nature and extent of the relationships between the independent variables and the dependent variables on the basis of the preceeding analysis of simple correlation coefficients is that the results obtained from such a study may be very misleading. The reason for this

is that the independent variable-dependent variable relationships which appear to be strong, may be artificial. In other words, such relationships may exist because of the intervening effects of other independent variables. For this reason, it is essential that controls be introduced to the analysis to deal with this possibility.

For all of the variables, with the exception of region, partial correlation is the technique used. In the case of region, analysis of covariance is applied to the variables in question. In order to avoid repetition, each individual variable is examined only in terms of the policy variables with which it was strongly related in the previous section. In addition, because of the size of the population of this study, only those independent variables which were also significantly related to the policy variable in question are used as controls.

By examining each of the independent variables in turn, we shall be able to see if the patterns established after the analysis of simple correlations remain in force or if new patterns indicate an extensive effect of intervening variables.

Income:

Table VIII-11 provides rather surprising results in the context of the previous examination. The Table indicates that income is significantly

related to only three of the policy variables when controls for the effects of other independent variables are applied.

Table VIII-11

Policy Variables by Income

Policy Variable	r	r^2
Psychiatric beds/10,000	-.5910	.34928
Chronic beds/10,000	-.4660	.21715
General practitioners/10,000	-.3785	.14326
Pharmacists' outlets/10,000	.4570*	.20884
Dentists/10,000	.3610	.13032
Opticians/10,000	.3802	.14455
Community health staff	-.5254*	.27604
Psychiatric beds' exp/1,000	.2908	.08456
Chronic beds' exp/1,000	-.4613	.21279
General practitioner exp.	-.5452	.29724
Dental expenditures/1,000	.3345	.11189
Community health exp/1,000	-.5344*	.28558

There are some similarities with the simple correlation results, however, Income is more likely to be related significantly with policy outcomes than policy outputs. Per capita income is also more likely to be related strongly with non-hospital variables than with hospital policy variables.

These results indicate that income works in conjunction with one of more of the other independent variables to produce the significant correlations obtained previously. On its own, when the effects of other independent variables are controlled, income does not explain variation in the policy outputs and outcomes of the Scottish Health Service

to any great extent.

Urbanisation:

Table VIII-12

Policy Variables by Urbanisation

Policy Variable	r	r^2
General beds/10,000	-.1146	.01313
Hospital doctors/10,000	.4280	.18318
Hospital nurses/10,000	.0793	.00628
Total expenditures/1,000	.1502	.12256
Hospital expenditures/1,000	.8294*	.68790
General beds' exp/1,000	.4293	.18429

* Significant at p=0.05 level of confidence

Table VIII-12 indicates the rather uninfluential status of urbanisation as an independent variable in our model. In only one of six instances is urbanisation strongly related with the policy variables indicated by simple correlation analysis.

Because of the low frequency of strong relationships involving urbanisation, it is difficult to speak of patterns of relationships. Only in the 1976 data do we find that urbanisation is more likely to be related to policy outputs than to policy outcomes. This follows the pattern outlined by the simple correlation analysis. An exception to the simple correlation pattern occurs with regard to the hospital policy variables. In 1976 urbanisation appears to be more likely to be related to hospital rather than to non-hospital policy variables. Neither

pattern holds true for the 1971, 1961 and 1951 results, however, and the analyses for these years produce no discernible pattern at all.

The partial correlation measures reinforce the apparent weakness of urbanisation as an explanatory variable. When controls for intervening variables are applied, urbanisation becomes virtually useless in terms of explaining health policy decisions in the Scottish Health Service.

Industrialisation:

Table VIII-13

Policy Variables by Industrialisation

Policy Variables	r	r^2
Chronic beds/10,000	-.3140	.09859
General practitioners/10,000	-.0693	.00480
Dentists/10,000	.2497	.06235
Community health staff/10,000	-.2127	.04524
General practitioner exp.	-.6604*	.43612
Dental expenditures/1,000	.1912	.03655
Community health exp/1,000	-.2617	.06848

Table VIII-13 indicates that the position of industrialisation as an independent variable is quite similar to that of urbanisation. In only one of the seven cases which were found to be significantly related after simple correlation analysis, does industrialisation remain strongly correlated with a policy variable. The exception to this pattern occurs ith the 1961 data in which industrialisation remains a significant factor in three of the four cases even

after partial control techniques are applied. In 1971 and 1951, however, the pattern is similar to that found in 1976.

There appears to be only one consistent pattern in terms of strong correlation with a particular type of policy variable. Industrialisation appears to be more likely to remain strongly related to policy outputs than to policy outcomes. There appears to be no consistent pattern insofar as the hospital and non-hospital policy variables are concerned.

Although the simple correlation analysis indicated that industrialisation might be a more useful independent variable than urbanisation, the partial correlation analysis suggests that this is not the case. When controls for intervening variables are applied, industrialisation becomes a relatively unimportant potential explanatory variable in the context of policy-making in the Scottish Health Service.

Region:

By using analysis of covariance techniques for this nominal level variable, we were able to control for other metric independent variables.[12] Table VIII-14 indicates a similar situation with regard to region as has been outlined for the other three socio-economic variables. In only three of the eight relationships which were significant in simple correlation analysis,

does a strong correlation between region and policy remain after controls have been applied.

Table VIII-14

Policy Variables by Region

Policy Variable	f
Chronic beds/10,000	3.383
General practitioners/10,000	1.559
Dentists/10,000	0.005
Community health staff	5.490*
General practitioner exp.	6.079*
Dental expenditures/1,000	0.148
Pharmaceutical exp/1,000	7.695*
Community health exp/1,000	4.179

* Significant to p=0.05 level of confidence

In 1976 region is slightly more likely to be strongly related to policy outputs than policy outcomes. This situation is reversed in 1961. In 1976 region tends to be more frequently related to non-hospital policy variables than hospital variables, but this pattern is also reversed in 1961. Clearly, no consistent long-term pattern of relationships between region and the various types of policy variables exists.

Although the historical development of the Scottish Health Service and the analysis of variance results suggested that region might be an important independent variable, the analysis of covariance techniques produce results which indicate differently. It appears that intervening variables do explain many

of the strong relationships between policy and region which were discussed previously.

Crude Death Rates:

Table VIII-15

Policy Variables by Crude Death Rates

Policy Variable	r	r^2
Psychiatric beds/10,000	-.0022	.00000
Chronic beds/10,000	.6882*	.47361
Community health staff	.5269*	.27762
Psychaitric beds' exp/1,000	-.4703	.22118
Chronic beds' exp/1,000	.6575*	.43230
General practitioner exp.	.0276	.00076
Dental practitioners/1,000	-.5924*	.35093
Community health exp/1,000	.5106	.26071

* Significant to p=0.05 level of confidence

Table VIII-15 indicates that in 1976 crude death rates were correlated strongly with four of the eight policy variables. Once again we see a reduction of considerable magnitude in the number of significant statistical relationships between independent and dependent variables when partial correlation techniques are applied.

One pattern of relationships follows that of the previous analysis. Crude death rates seem to be as likely to be strongly related to hospital as to non-hospital policy variables. Crude death rates also tend to be more frequently related to policy outcomes than to policy outputs.

One interesting finding is that the 1976 results are not supported by any of the previous years' data. In 1951, 1961 and 1971, crude death rates are not related significantly to any of the policy variables. It may be that because mortality rates have only recently been viewed as indicators of need in a specific policy making perspective, it is only just now that they have begun to have some effect on policy decisions in the Scottish Health Service.

Despite the improvement of crude death rates as potential explanatory variables in 1976, their utility as meaningful independent variables remains very slight indeed when controls for the effects of intervening variables are included in the analysis.

Standardised Mortality Rates:

Table VIII-16

Policy Variables by Standardised Mortality

Policy Variable	r	r^2
General practitioners/10,000	-.4187	.17530
Community health staff/10,000	-.0814	.00662
General practitioner exp.	-.4069	.16544
Community health exp/1,000	.0693	.00480

Table VIII-16 indicates the extremely weak position of standardised mortality rates as potential explanations of policy variation in the Scottish Health Service. In no case is the standardised mortality rate significantly related to public policy.

This lack of influence is a consistent one. When partial control techniques were applied to the 1951, 1961 and 1971 data, no significant relationships emerged. Even though the standardised mortality rate has been pointed to as the best available indicator of need in the Scottish Health Service, it appears that from 1951 to 1976, standardised mortality rates have had no independent effect upon the policy decisions taken.

Infant Mortality Rates:

Table VIII-17

Policy Variable by Infant Mortality Rates

Policy Variable	r	r^2
Psychiatric beds/10,000	.6967*	.48539
Chronic beds/10,000	.2316	.05363
General practitioners/10,000	.5417*	.29343
Dentists/10,000	.2450	.06002
Chronic beds' exp/1,000	.2153	.04635
General practitioner exp.	.5768*	.33269
Community health exp/1,000	-.1116	.01245

* Significant to p=0.05 level of confidence

As was the case with crude death rates, Table VIII-17 demonstrates that there is a reduction in the number of policy variables with which infant mortality rates remain strongly related. In only three of the seven previously determined cases, do crude death rates remain strongly correlated with health policy variables.

The 1976 statistics suggest that infant mortality rates are more likely to be related to policy outcomes than policy outputs. They also indicate that infant mortality rates tend to be more frequently correlated with non-hospital than with hospital policy variables.

Just as in the case of crude death rates, infant mortality rates are not related strongly to any policy variable in 1951, 1961 or 1971. Given the rather small number of meaningful relationships in 1976, this finding should not be too surprising. What it does indicate, however, is that when the effects of other independent variables are controlled, infant mortality rates have little independent effect upon public policy.

Total Staff:

Table VIII-18

Policy Variables by Total Staff

Policy Variable	r	r^2
Total Beds/10,000	.0757	.00573
Psychaitric beds/10,000	-.3537	.12510
General beds/10,000	.6533*	.42680
Hospital doctors/10,000	.2836	.08042
Hospital nurses/10,000	.9708*	.94245
Dentists/10,000	.1500	.02250
Opticians/10,000	.0666	.00443
Total expenditures/1,000	.9458*	.89453
Hospital expenditures/1,000	.9101*	.82828
General beds' exp./1,000	.9286*	.86229
Psychiatric beds' exp/1,000	.1965	.03861
Dental expenditures/1,000	.4968	.24681

* Significant at p=0.05 level of confidence

Table VIII-18 demonstrates the pattern which has been experienced by all of the independent variables considered thus far. The total number of staff is correlated significantly with only five of the twelve policy variables determined by simple correlation.

The patterns of relationships follow those of the simple correlation. Total staff is more frequently strongly related with policy outputs than policy outcomes. Total staff tends to be more frequently correlated significantly with hospital than with non-hospital policy variables.

Although the simple correlations indicated that the number of total staff of a Health Board is likely to be an important independent variable, the partial correlation analysis suggest that intervening variables produced such a pattern. The independent effect of the total number of staff upon the policy outputs and outcomes of the Scottish Health Service appears to be a limited one.

Number of Teaching Hospitals:

Table VIII-19 demonstrates the relative decline in importance of the number of teaching hospitals when partial correlation techniques are applied. Only three of the ten relationships uncovered by simple correlation analysis remain strong when the effects of intervening variables are controlled.

Table VIII-19

Policy Variable by Number of Teaching Hospitals

Policy Variable	r	r^2
General beds/10,000	.1326	.01758
Hospital doctors/10,000	.5539*	.30680
Hospital nurses/10,000	-.6819*	.46498
Pharmacists Outlets/10,000	.2761	.07623
Dentists/10,000	.2439	.05948
Opticians/10,000	.5095*	.25959
Total expenditures/1,000	.0610	.00372
Hospital expenditures/1,000	-.3089	.09541
General beds' exp./1,000	.3432	.11778
Dental expenditures/1,000	-.0158	.00024

* Significant to p=0.05 level of confidence

The patterns of relationships follow the patterns discovered previously. The number of teaching hospitals is more likely to be related significantly with policy outcomes than policy outputs. It tends to be correlated more frequently with hospital than with non-hospital policy variables.

Although the simple correlation results indicated that the number of teaching hospitals was an important independent variable, especially insofar as hospital policy was concerned, the partial correlation analysis indicates that a great deal of this is due to intervening variable effects. Once again, it seems that the independent effect of one of our independent variables, the number of teaching hospitals is rather weak.

The Policy Process:

Table VIII-20

Policy Variables by the Policy Process

Policy Variable	r	r^2
Total beds/10,000	.3624	.13133
Psychiatric beds/10,000	.9463*	.89548
Chronic beds/10,000	.6698*	.44863
General beds/10,000	.7882*	.62125
Hospital doctors/10,000	.4857	.23590
Hospital nurses/10,000	-. 2523	.06365
General practitioners/10,000	.5838*	.34082
Dentists/10,000	.3994	.15952
Hospital expenditures/1,000	.7938*	.63011
General beds' exp/1,000	.8959*	.80263
Psychaitric beds' exp/1,000	.9642*	.92968
Chronic beds' exp/1,000	.6706*	.44970
General practitioner exp.	.6709*	.45010
Dental expenditures/1,000	.6201*	.38452
Pharmaceutical exp./1,000	.5422*	.29398

* Significant to p=0.05 level of confidence

Table VIII-20 provides evidence of a similar pattern insofar as the policy process is concerned. It also indicates that unlike the other independent variables, the policy process continues to be an important explanatory variable even after partial correlation techniques are applied. In eleven of the fifteen cases determined by simple correlation, the policy process remains strongly correlated with policy variables even after controls for intervening variables are introduced.

The data indicate that the policy process is more likely to be related to policy outputs than to policy outcomes. The 1961 data indicates a slight shift

in favour of the policy outcomes, but the 1971 statistics coincide with the 1976 pattern. The Table also demonstrates that the policy process tends to be more frequently related to non-hospital variables than to hospital variables. This pattern is reversed in 1961 and 1971. The old pattern is the more likely one, since the differences in 1976 are relatively minor and the differences in 1961 and 1971 are very strong. [13]

The major differences between the policy process and the other independent variables is that the policy process remains as an important potential explanatory variable even after partial correlation techniques are applied. This provides support for our hypothesis that the nature of the policy process is the most influential of the independent variables included in the policy model.

Conclusion:

In this chapter two types of statistical techniques were applied in order to facilitate an understanding of the relationships between the independent and dependent variables of the model outlined in Chapter III. At first simple correlation was undertaken. This procedure identified each of the dependent variables with which each of the independent variables was correlated strongly. Following this step, partial correlation techniques were applied to those cases identified by

simple correlation as being worthy of more intensive examination.

The simple correlation results indicated that per capita income, the total number of staff, the number of teaching hospitals and the policy process were related strongly to more than 50% of the health policy variables. This evidence provided some support for the hypotheses regarding these particular variables and public policy in the Scottish Health Service. When partial correlation procedures were applied, the policy process was the only independent variable which remained strongly correlated with more than 50% of the policy variables.

This finding provides support for only one of the relevant hypotheses - there is a strong relationship between the nature of the policy process and the policy outputs and outcomes of the various Health Board Regions in Scotland. The analysis also suggests that intervening variables play an important role in determining the existence of simple correlations. For this reason, it appears logical to assume that multiple correlation may reveal a great deal about the relationships between the three type of independent variables - socio-economic factors, health status indicators and government structure characteristics - and the health policy outputs and outcomes of the

Scottish Health Service. It is this aspect of the model which provides the focus of attention for the next chapter.

Chapter IX

The Relationship Between Multiple Independent Variables and Policy Outputs and Outcomes

Introduction:

The analysis presented in Chapter VIII suggested that, because of intervening variable effects, it might be important to examine the relationships between groups of independent variables and policy outputs and outcomes. Following the logic of the policy model outlined in Chapter III, this chapter examines three sets of independent variables - socio-economic factors, health status indicators and government structure characteristics - in terms of their relationships with public policy in the Scottish Health Service.

The statistical techniques employed are common ones. Initally, multiple regression analysis is used to obtain a multiple correlation coefficient. The square of this coefficient provides us with a value which indicates the percentage of the variation within the dependent variable which is explained by the dependent variable. Multiple partial correlation is also employed. Unlike partial correlation, multiple partial correlation does not control for the effects

of other independent variables. Rather, it indicates the percentage of unexplained variation which becomes explained when a new multiple variable is added to the equation.[1]

Once again, only the tables presenting the analysis of the 1976 data are included in the text of the chapter. The 1971 and 1961 analyses are provided in Appendices J and I. If the 1976 patterns and results do not coincide with the results for other years, this is duscussed in the text. Obviously, the 1951 data must be omitted at this stage because the policy process variable requires expenditure information from the preceeding interval and pre-1951 data is not available in this study. This data limitation also affects the government structure variable for 1961 because we were unable to obtain accurate information on the number of total staff for each Health Board for 1961. The reader is advised that the government structure variable for 1961 contains only two independent variables - the nature of the policy process and the number of teaching hospitals - rather than the customary three variables. Whether this change might affect the results of the analysis for 1961 may be determined below.

Health Status and Policy:

Table IX-1 indicates that in only three of twenty-one possible cases is health status significantly

related with policy outputs and outcomes in 1976. In only 14.3% of the available opportunities is there a reasonably strong link between the independent and dependent variables.

Table IX-1

Health Policy with Health Status

Policy Variable	r	r^2
Total beds/10,000	.32338	.10457
Psychiatric beds/10,000	.59898	.35878
Chronic beds/10,000	.79632*	.63413
General beds/10,000	.16843	.02837
Hospital doctors/10,000	.34196	.12694
Hospital nurses/10,000	.17194	.02956
General practitioners/10,000	.58648	.34396
Pharmacists' outlets/10,000	.45926	.21092
Dentists/10,000	.58869	.34656
Opticians/10,000	.20126	.04050
Community health staff	.69037	.47661
Total expenditures/1,000	.09210	.00848
Hospital expenditures/1,000	.22533	.05077
General beds' exp/1,000	.17644	.03113
Psychiatric beds' exp/1,000	.58126	.33670
Chronic beds' exp/1,000	.69007	.52328
General practitioner exp.	.72338*	.52328
Dental expenditures/1,000	.61774	.38160
Pharmaceutical exp/1,000	.40147	.16118
Optical expenditures/1,000	.57238	.32762
Community health exp/1,000	.71431*	.51024

* Significant at $p=0.05$ level of confidence

Even in cases where the relationship is significant, health status does not explain a great deal of the variation in health policy. In 1976, health status is more strongly related to the number of chronic beds per capita. It explains only 63.4% of the variation between Health Board Regions in

terms of the number of chronic beds per capita.

Health status is more likely to be strongly related to policy outputs than policy outcomes. It is significantly correlated with 20% of the policy outputs and 9.1% of the policy outcomes. Health status is also more likely to be strongly related to non-hospital policy variables than with hospital policy variables. It is correlated strongly with 18.2% of the non-hospital variables and with only 10% of the hospital variables.

Socio-Economic Factors and Policy:

Table IX-2 demonstrates that in only 7 of 21 possible cases was socio-economic status significantly correlated with health policy in Scotland. In 33% of the available opportunities, there was a resonably strong link between the two sets of variables.

In the statistically significant relationships, socio-economic factors tend to explain a greater percentage of the variation in the dependent variable than was the case for health status. In 1976, for example, socio-economic factors are most strongly correlated with general practitioner expenditures per capita. They explain 92% of the variation between Health Board Regions in terms of the expenditures on general practitioner services per capita.

Table IX-2

Health Policy by Socio-Economic Factors

Policy Variable	r	r^2
Total beds/10,000	.40245	.16196
Psychiatric beds/10,000	.56616	.32054
Chronic beds/10,000	.79989*	.63982
General beds/10,000	.55365	.30652
Hospital doctors/10,000	.70191	.49267
Hospital nurses/10,000	.55528	.30834
General practitioners/10,000	.90749*	.82804
Pharmacists' outlets/10,000	.55099	.30359
Dentists/10,000	.82750*	.68475
Opticians/10,000	.55058	.30314
Community health staff/10,000	.83215*	.69247
Total expenditures/1,000	.56264	.31656
Hospital expenditures/1,000	.62083	.38543
General beds' exp/1,000	.62756	.39383
Psychiatric beds' exp/1,000	.64499	.41601
Chronic beds' exp/1,000	.74771	.55906
General practitioner exp.	.95957*	.92077
Dental expenditures/1,000	.78847*	.62169
Pharmaceutical expenditures	.56555	.31984
Optical expenditures/1,000	.38344	.14703
Community health exp/1,000	.82759*	.68490

* Significant at p=0.05 level of confidence

In 1976 socio-economic factors are more likely to be strongly related to policy outcomes than to policy outputs. It is significantly related with 36.4% of the policy outcomes and 30% of the policy outputs. This 1976 experience does not reflect a long-standing pattern because there is no difference in frequency of strong relationships in 1971 between policy outputs and outcomes and the 1961 situation is the reverse of the 1976 pattern.

The most stable pattern over time applied to the tendency of socio-economic factors to be more

liekly to be related strongly with non-hospital rather than hospital policy variables. In 1976 socio-economic factors are correlated significantly with 54.5% of the non-hospital policy variables and only 10% of the hospital policy variables. This pattern continues in 1971 and 1961.

Government Structure and Policy:

Table IX-3

Health Policy by Government Structure

Policy Variable	r	r^2
Total beds/10,000	.92202*	.85013
Psychiatric beds/10,000	.96093*	.92338
Chronic beds/10,000	.78296*	.61302
General beds/10,000	.97336*	.94743
Hospital doctors/10,000	.97718*	.95487
Hospital nurses/10,000	.99800*	.99600
General practitioners/10,000	.92559*	.85746
Pharmacists' outlets/10,000	.43645	.19049
Dentists/10,000	.83051*	.68975
Opticians/10,000	.68717	.47220
Hospital expenditures/1,000	.99394*	.98791
General beds' exp/1,000	.99325*	.98655
Psychiatric beds' exp/1,000	.98972*	.97955
Chronic beds' exp/1,000	.74416*	.55378
General practitioner exp.	.94650*	.89585
Dental expenditures/1,000	.90750*	.82356
Pharmaceutical exp/1,000	.54774	.30002
Optical expenditures/1,000	.91984*	.84610

* Significant at p=0.05 level of confidence

Table IX-3 indicates that in 15 of 18 possible cases, government structure is correlated significantly with health policy in Scotland in 1976. In 83% of the available opportunities, there is a strong link between the two sets of variables.

In the statistically significant relationships government structure tends to explain a greater percentage of the variation in the dependent variables than was the case even for socio-economic factors. In 1976, for example, government structure is correlated most strongly with the number of hospital nurses per capita. It explains 99.6% of the variation between Health Board Regions in terms of the number of hospital nurses per capita.

As one might expect from a previous analysis, government structure is more likely to be related significantly with policy outputs than with policy outcomes. It is strongly related with 87% of the policy outputs and 80% of the policy outcomes in 1976.

Government structure is also more likely to be strongly related to hospital than to non-hospital policy variables. In 1976 government structure is correlated significantly with 100% of the hospital variables and 62.5% of the non-hospital policy variables.

This analysis of the multiple correlations tends to confirm our hypothesis that government structure is the most influential multiple independent variable of the three included in the policy model. Further evidence to support this conclusion may be obtained by examining the results of the multiple-partial correlation analysis.

Health Status and Policy:

Table IX-4

Policy with Health Status

Policy Variable	R^2
Total beds/10,000	.3235
Psychiatric beds/10,000	.3063
Chronic beds/10,000	.6041*
General beds/10,000	.2837
Hospital doctors/10,000	.3291
Hospital nurses/10,000	.1967
General practitioners/10,000	.8081
Opticians/10,000	.2257
Pharmacists' outlets/10,000	.8339
Dentists/10,000	.7063
Hospital expenditures/1,000	.2400
General beds' expenditures	.1588
Psychiatric beds' exp/1,000	.0681
Chronic beds' exp/1,000	.3956
General practitioner exp.	.4151
Dental expenditures/1,000	.8299
Pharmaceutical expenditures	.4451
Optical expenditures/1,000	.7909

* Highest percentage unexplained variation explained of the three independent variables

Table IX-4 indicates that health status explains between 6.8% and 82.99% of the variation within the policy variables which is not explained by socio-economic factors and government structure. The Table also indicates that in only 1 of 18 cases does health status explain a greater percentage of the unexplained variation than either of the other two independent variables. In 1976 health status explained 60.41% of the variation left unexplained in the number of chronic beds/10,000 after socio-economic

factors and government structure had been included in the regression equation.

Socio-Economic Factors and Policy:

Table IX-5

Policy with Socio-Economic Factors

Policy Variable	R^2
Total beds/10,000	.1536
Psychiatric beds/10,000	.5063
Chronic beds/10,000	.5317
General beds/10,000	.4099
Hospital doctors/10,000	.2145
Hospital nurses/10,000	.1145
General practitioners/10,000	.8319
Opticians/10,000	.3794*
Pharmacists' outlets/10,000	.7768
Dentists/10,000	.8910
Hospital expenditures/1,000	.6250
General beds' exp./1,000	.3187
Psychiatric beds' exp/1,000	.5580
Chronic beds' exp/1,000	.2497
General practitioner exp.	.7908*
Dental expenditures/1,000	.5908
Pharmaceutical exp/1,000	.4646
Optical expenditures/1,000	.5897

* Highest percentage of unexplained variation explained of the three independent variables

Table IX-5 demonstrates a pattern similar to that described earlier. Socio-economic factors tend to explain more of the unexplained variation more frequently than health status. Socio-economic factors in 1976 explain between 11.45% and 89.1% of the variation within the policy variables which is not explained by health status and government structure.

The Table also indicates that in only 3 of 18 cases - the number of dentists per capita, the number of opticians per capita and the expenditures on general practitioner services per capita - does socio-economic status explain a greater percentage of the unexplained variation than either of the other two independent variables. In 1976, for example, socio-economic factors explained 89.1% of the variation in the number of dentists per capita left unexplained after health status and government structure had been included in the regression equation.

Government Structure and Policy:

Table IX-6

Policy with Government Structure

Policy Variable	R^2
Total beds/10,000	.8808*
Psychiatric beds/10,000	.9581*
Chronic beds/10,000	.5170
General beds/10,000	.9673*
Hospital doctors/10,000	.9567*
Hospital nurses/10,000	.9953*
General practitioners/10,000	.8921*
Opticians/10,000	.1590
Pharmacists' outlets/10,000	.8470*
Dentists/10,000	.8750*
Hospital expenditures/1,000	.9958*
General beds' exp/1,000	.9861*
Psychiatric beds' exp/1,000	.9870*
Chronic beds exp/1,000	.4170*
General practitioner exp.	.7040
Dental expenditures/1,000	.9073*
Pharmaceutical exp/1,000	.5864*
Opticians' expenditures	.9699*

* Highest percentage of unexplained variation explained of the three independent variables.

Table IX-6 indicates the same type of pattern demonstrated by the examination of multiple correlation coefficients above. Government structure tends to explain more of the unexplained variation more frequently than either socio-economic factors or health status. In 1976 government structure explains between 15.9% and 99.58% of the variation within the policy variables which is not explained by socio-economic factors or health status.

The Table also demonstrates that in 14 of 18 cases government structure explains a greater percentage of the unexplained variation that either of the other two independent variables. In the case of hospital expenditures per capita in 1976, for example, government structure explains 99.58% of the variation left unexplained after health status and socio-economic factors had been included in the equation.

Conclusion:

The results of the analysis of multiple correlation and multiple-partial correlation statistics are not particularly surprising in the context of the analysis of single independent variables and policy in the previous chapter. Nevetheless, the regression based analyses confirm our hypothesis that government structure is more strongly related to health policy in Scotland than either socio-economic status or health status.

The multiple correlation coefficients demonstrated that government structure was significantly related to policy in 71% to 83% of the possible opportunities from 1961 to 1976. They also indicated that government structure was more likely to explain more of the policy variation more often than either socio-economic status or health status.

The multiple-partial correlation analysis revealed a similar pattern. Government structure was more likely to explain more of the unexplained variation more frequently than either of the other two multiple independent variables.

The results of this chapter and the preceeding analyses have clear implications for the original concerns of the dissertation which were presented in Chapter I. They also have implications insofar as the direction of health policy in Scotland is concerned. This discussion forms the basis of the concluding chapter which follows.

Chapter X

Conclusion

The research project described in this dissertation had two major objectives. The first of these was to assess the effectiveness of one aspect of public policy. Specifically, the initial effort was to determine the extent to which the NHS in Scotland had been able to achieve regional equality in health care expenditures, staffing and facilities during the 1951 to 1976 period. Although a few studies of this type had been conducted to analyse the effectiveness of the NHS in England and Wales, no such examination of the Scottish experience had been carried out previously.

The second major objective of the research project was to explain the policy variation which was found to exist between the Health Board Regions over time. By using an input-output approach, which had been pioneered in the U.S. by Dye, Hofferbert and Sharkansky, and developed in the U.K. by Boaden and Alt, we were able to develop a policy model. This model allowed us to test a number of hypotheses which reflected Dearlove's critique of input-output studies. The model, which was developed in Chapter III

was unique in the sense that it incorporated many of the suggestions by Alt and Sharpe of refining and disaggregating policy outputs into a number of expenditure items as well as establishing service items as policy outcomes. The policy model was also unique in terms of the particular independent variables selected for intensive investigation. Income, industrialisation, urbanisation and region allowed us to test for class bias and differential participation rate effects on policy. By using mortality rates we were able to create more direct indicators of need than those used by Boaden and Davies and, at the same time, reflect the recent official definitions of need established by the SHS. Finally, the inclusion of government structure factors - the nature of the policy process, the number of total staff and the number of teaching hospitals - allowed us to determine whether or not political factors had some effect upon policy outputs and outcomes.

In order to carry out the study and to conduct the required statistical analysis, a data base had to be developed. The data set which was established was an original one. It relied upon unpublished as well as published sources of information. In addition, considerable manipulation of the raw data was needed in order to have data which conformed to the regional boundaries created by the reorganisation of the NHS

in Scotland by the 1972 legislation.

An historical examination of the period prior to the creation of the NHS indicated a reasonable probability that regional variation had been a strong feature of the health care system in Scotland prior to 1948. The descriptive statistics presented in the dissertation demonstrated the lack of success of the SHS in achieving regional equality in the first 27 years of its existence.

This evidence clearly points out that the NHS in Scotland has failed to meet one of its original objectives. Regional equality, measured in terms of expenditures, health care staff and health care facilities, has not been achieved in Scotland. In fact, an examination of the values of the coefficient of variation over time shows that in several cases, the extent of variation between Health Board Regions is greater in 1976 than it was in 1951. Of 15 dependent variables for which we have both 1951 and 1976 data, 6 experience an increase in the extent of variation between regions. These include general beds' expenditures, general practitioner expenditures, dental expenditures, optical expenditures, the number of hospital doctors and the number of pharmaceutical chemists' outlets. In 40% of the available opportunities, the degree of differentiation between Health Board Regions has actually increased over time.

This result leads one to conclude that, even if Eckstein's notion of a rational,comprehensive, planning philosophy providing a stimulus for the creation of the NHS was correct, the implementation and development of the NHS in Scotland do not demonstrate the application of rational, comprehensive planning. Essential to rational planning in any of the rational planning models is evaluation and a concern for policy effectiveness. Obviously, there was no serious effort made by the SHS policy-makers to assess the extent to which they were achieving policy goals and to take corrective measures if necessary.

One might argue that the regional disparities reflect or are unintended consequences of major decisions taken during the period. The Hospital Plan and the effort to set up five centres of excellence in the Scottish Health Service may provide an example. The construction and alteration of hospital facilities in Aberdeen, Inverness, Dundee, Glasgow and Edinburgh demanded significant capita expenditures. Even if these decisions were rational from the perspective of limited capital expenditure resources, they may have produced distortions in ordinary revenue expenditure patterns. Once these new and/or expanded facilities were built, they had to be equipped, staffed and maintained from ordinary revenues by the various

SHS agencies. Since the total budget of the NHS in Scotland was limited throughout this period, other areas were unable to receive the additional revenues necessary to redress the growing imbalances which were appearing.

One other explanation of this situation may be that goal displacement took place during the period. To some extent, this perspective is supported by the recent Report of the Royal Commission on the National Health Service. It indicates that " a fundamental purpose of a national service must be equality of provision ",[1] but it also argues that " it is unrealistic to suppose that people in all parts of the United Kingdom can have equal ease of access to all services of an identical standard ".[2] The Commission went on to point out that the NHS has to be responsive to local needs.[3] It points out and discusses the special problems of rural and declining urban areas, yet it fails to provide any definition of need.

If one accepts the socio-economic factors or the health status indicators as reasonable measures of need, then the analysis indicates that the SHS has failed to meet even such a revised objective. Socio-economic and health status factors are only infrequently related to health policy outputs and outcomes in Scotland, and this indicates that the SHS has not

been responding effectively to local need.

Unlike the U.S. experience, one cannot blame this on a peculiar policy perspective on the part of the policy-makers. In the U.S., as Sharkansky and others have suggested,[4] politicians often assume that an increase in expenditure will produce an improvement in service. Sharkansky has demonstrated that in the U.S. this is not the case. The Scottish experience, however, is quite the reverse of the American situation. The relationships between policy outputs and policy outcomes are strong positive ones. As far as the SHS is concerned, there is a rather efficient translation of expenditures into staff and facilities.

This strong relationship might be the result of disaggregating policy outputs to much more precise measures than the gross expenditure items used in the American studies. By using health expenditures per capita and relating this to more precise service items such as the number of physicians per capita, Dye and Sharkansky allow for the possibility of shifting priorities in expenditure decisions from one aspect of health care to another. This study does not use such an approach but approximates it to some extent in the case of one independent variable. Previous hospital expenditures are related to three service indicators

(outcomes) in our study and the pattern over time is a consistent one. Previous hospital expenditures remains strongly correlated with the total number of beds, the total number of hospital doctors and the total number of hospital nurses. Such a pattern suggests the existence of an efficient translation of expenditures to services in a consistent fashion over time.

Inductive statistical analysis provided a number of additional insights. Socio-economic variables, including region, correlated significantly with health policy outputs and outcomes in an infrequent and spasmodic fashion. Table X-1, for example, indicates that only once in 18 opportunities did a socio-economic variable explain more of the variation than one of the other independent variables. Only in the case of the number of pharmacists' outlets/10,000 for 1976 is income the most powerful explanatory variable.

Tables IX - 1,2, and 3 indicate that on only two of 18 opportunities do socio-economic factors, as a group, explain more of the variation in dependent variables than one of the two other multiple independent variables in 1976. In the cases of the number of pharmacists' outlets/10,000 and pharmaceutical expenditures/ 1,000, socio-economic factors explain more of the variation than either health status or government structure characteristics. It should be noted, however, that in both cases, the statistical relationships are

not significant ones.

Table X-1

Policy Variables and Model

Policy Variable	4 Most Powerful Independent Variables	% Variation Explained 4 Variables	% Variation Explained All Variables
Total Beds/ 10,000	previous expenditures teaching hospitals SMR industrial-isation	89.25	90.95
Psychiatric Beds/ 10,000	previous expenditures SMR income total staff	97.02	97.89
Chronic Beds/ 10,000	previous expenditures crude death rate region total staff	90.87	93.23
General Beds/ 10,000	previous expenditures total staff industrial-isation income	96.68	97.99
Hospital Doctors/ 10,000	total staff teaching hospitals infant mortality rate previous expenditures	97.71	98.22

Policy Variable	4 Most Powerful Independent Variables	% Variation Explained 4 Variables	% Variation Explained All Variables
Hospital Nurses/ 10,000	total staff teaching hospitals previous expenditures crude death rate	99.62	99.70
General Practitioners/ 10,000	previous expenditures teaching hospitals region Infant mortality rate	93.87	98.73
Pharmacists' Outlets/10,000	income total staff SMR crude death rate	52.19	60.09
Dentists/10,000	previous expenditures infant mortality rate crude death rate industrial-isation	87.89	96.90
Opticians/10,000	teaching hospitals urbanisation region industrial-isation	77.74	94.36
Hospital Expenditures/ 1,000	total staff urbanisation previous expenditures infant mortality rate	99.72	99.77

Policy Variable	4 Most Powerful Independent Variables	% Variation Explained 4 Variables	% Variation Explained All Variables
General Beds' Expenditures/ 1,000	previous expenditures total staff urbanisation SMR	99.21	99.30
Psychiatric Beds' Expenditures/ 1,000	previous expenditures industrial-isation urbanisation total staff	99.37	99.42
Chronic Beds' Expenditures/ 1,000	previous expenditures crude death rate income region	82.13	83.86
General Practitioner Expenditures/ 1,000	previous expenditures region industrial-isation income	96.43	98.27
Dental Expenditure/ 1,000	previous expenditures crude death rate total staff SMR	91.44	97.73
Pharmaceutical Expenditures/ 1,000	previous expenditures region infant mortality SMR	72.56	80.23
Optical Expenditures/ 1,000	previous expenditures infant mortality crude death rate SMR	95.09	98.28

This provides us with some bases from which we can discuss the way in which policy is made in the SHS. It suggests that social class, defined as socio-economic status, does not produce a differential participation rate in which the more active middle and upper class citizens are able to pressure the NHS in Scotland to respond inequitably in their favour. It also suggests that the relative homogeneity of the senior civil service and upper and middle class sectors of the population does not produce a noticeable bias, in terms of policy decisions, which favours these groups. It is also apparent that, despite the numerous studies conducted on the subject of class-based deprivation, these more general indicators of need do not function as a stimulus to Scottish policy-makers which results in improvements for areas of relative deprivation. Clearly, this general environmental concept of need does not explain successfully, the pattern of policy decisions of the SHS from 1951 to 1976.

The mortality rates relationships are even more shocking. Despite the official pronouncements regarding the use of standardised mortality rates as indicators of need, the relationships of strong significance were rare with all three of the mortality rates used.

Table X-1 indicates that on none of the 18 opportunities does a health status indicator explain more of the variation in a dependent variable than one of the other independent variables. Tables IX-1,2 and 3 indicate that on only 1 of 18 opportunities does health status indicators, as a group, explain more of the variation in the dependent variables than one of the two other multiple independent variables. In the case of optical expenditures/1,000 health status factors explain more of the variation than either socio-economic factors or government structure characteristics. It should be noted, however, that in this case , the statistical relationship is not a significant one.

There are two important conclusions which can be drawn from this experience. If mortality is an accepted indicator of need, and if equality of service based upon need is an objective of the NHS in Scotland, then massive changes are required in capital as well as ordinary expenditure budgetary allocations. New facilities and increased staff must be provided for those regions in which mortality rates are high if such an objective is to be attained. It is also apparent that these more direct indicators of health need do not trigger a virtually automatic response from policy-makers in the SHS. Clearly,

this environmental stimulus does not function effectively in producing a response. This objective indicator of need, then, is either ignored to a large extent, or perceived in a distorted subjective fashion by those who make the policy decisions for the SHS.

The analysis of government structure variables with policy outputs and outcomes tended to confirm our hypotheses. These variables were correlated significantly with policy more frequently than the other independent variables.

Table X-1 indicates that on 17 of 18 opportunities, a government structure characteristic explains more of the variation in a dependent variable than one of the other independent variables in 1976. Tables IX-1,2 and 3 indicate that on 15 of 18 opportunities, government structure characteristics, as a group, explain more of the variation in the dependent variables than one of the two other multiple independent variables in 1976.

This suggests that the policy decisions must be viewed as the result of internal rather than environmental pressures. In particular, Table X-1 demonstrates the crucial importance of the policy process (previous expenditures) as an explanatory variable . In 13 of 18 opportunities, previous expenditures is the most powerful independent variable.

This evidence supports the case study conclusions reached by David Hunter.[5]

We may be able to appreciate this process of expenditure decision-making by refering to some of the available literature on this subject.

When one examines studies of expenditure policy-making at the national level in Britain, one is struck by the number of different perspectives used by researchers in their analyses of the process. One is also struck by the similarity of their conclusions insofar as the results of the policy-making process are concerned.

Ashford, for example, feels that adversarial politics characterise the British political system. In a number of case studies, he demonstrates that " adversarial behaviour is pronounced and dramatic, but focused less on the assessment and goals of existing and future choices than on supporting the existing structure " [6]. Because of this, policy innovation and experimentation are not particularly valued qualities of ministers.[7] This is reflected in policy decisions. " The precedents in expanding social security are obligations to the future and do not easily accomodate the new needs and preferences. "[8]

Heclo and Wildavsky, in their revealing examination of expenditure decision-making processes

at Whitehall, point out some of the more inflexible areas insofar as change is concerned. " Spending on cash transfers is treated as one of the most inflexible elements in the entire system of expenditure control. " [9] They also note that " the expenditure process exhibits a second over-arching social policy influence by deemphasising redistribution questions ". [10]

Smith outlines the obstacles which prevent the implementation of more fully rational policy-making processes in Part III of his book. [11] This " ' bounded rationality ' leads to incremental and marginal adjustments to existing goals and policies ". [12] This conclusion is supported by Heclo and Wildavsky's examination of some of the steps taken to rationalise the expenditure policy process. " In short, PESC has enshrined incrementalism with a vengeance....Both sides find it more difficult to depart from the historical debate." [13]

The studies of expenditure decisions for the NHS in England and Wales again emphasise the incrementalist nature of the process. In his excellent review of " Policy-Making in the NHS ", Klein makes this point frequently. " To take the geographical distribution of resources first, the figures suggest that the single most important factor in explaining the present allocation of funds is history. " [14] He notes that "... with very few exceptions, the high-spending areas inherited by the NHS have remained the high-spending regions of the seventies ". [15]

" All this suggests that NHS policy-making, as far as the rationing of resources in concerned, takes place in the cracks and crannies of incrementalism." [16] Maddox's discussion of decision-making in the NHS for England and Wales take us one step further. It describes the process in the late 60's and " relates this to Lindblom's model of disjointed incrementalism ". [17]

The pattern at the national level in Scotland appears to be very similar. Wiseman's review notes that policy-making in the SHS in the past bears strong resemblances to muddling through. [18] His analysis pointed out that " no consistent or coherent basis for settling priorities currently existed ". [19] Lind and Wiseman's examination of policy-making in the SHHD indicated that policy processes " were geared very much towards the administration and management of existing services ". [20]

All of these studies indicate that our findings should not come as a shock to the reader. Unfortunately, they fail to tell us why or how such incrementalist decisions are made by Health Boards in Scotland. Fortunately, David Hunter's research on this subject does provide a good deal of this kind of information.

Hunter examined the expenditure decision-making processes of two medium-sized Health Boards in Scotland after re-organisation. He noted that most of the funds allocated to Health Boards were already set aside for

existing commitments. [21] Insofar as these funds were concerned, Hunter claimed that " it would not be unfair to describe the decision-making process ... as consisting largely of administering and maintaining an on-going system rather than of making changes in it ".[22]

Because of this, Hunter looks specifically at the allocation of development funds. Development funds are new money which " enables a health board to develop new services, improve existing ones, or to change direction as a result of the particular emphasis placed on certain services ". [23] In essence, this is funding without a " history " which might be more likely to be disbursed in a non-incremental fashion. Hunt

Hunter's research indicates that even with the development funds, the process follows an incrementalist pattern. He describes the constraints which produce this pattern as follows:

> 1) Existing Services - A health board is stuck with the services it inherits from the past. Once services are established, a board is committed to maintaining them....
> 2) Time - This is an obvkous constraint which affects decision-makers in any organisation....Because of this tight timetable, administrators lack time to prepare detailed cases supporting every submission....
> 3) Lack of Information - Information is sometimes available, but may not be used because of the amount of time involved in assembling it. This results in greater weight being attached to the persuasiveness of a particular officer in putting a case for a development....
> 4) Consultation - There is a necessity to

> consult widely before final decisions on DF can be reached....Officers are not keen to cause offence to anyone, particularly the medical profession....
> 5) Consensus Decision-Making - The executive groups at Area and District levels operate as consensus-forming teams....
> 6) Priority-Setting - Officers experience great difficulty in placing requests in some order of priority.... Decisions about priorities between different disease or dependence groups pose complext problems. ..and they raise fundamental value questions.... Decision-makers face these dilemmas when allocating DF and it is easy to reduce priority-setting to a matter or life and death criteria.
> 7) Local Authority Influence - .... The cuts in local government expenditure have had an effect on the provision of home helps which makes it much more difficult for health boards to speed up discharges from hospitals.
> 8) Senior Levels of Government - The SHHD imposes constraints on decision-makers in Health Boards....It also means reinforcing the institutional bias in health care provision.... [24]

For these reasons, the decision process is " fluid, random and messy ". [25] " From the start, decision makers are involved in a reactive process as opposed to an anticipatory one. " [26] Each submission is reviewed in isolation without reference to particular goals. " The overall tendency is to review each development in a vacuum. " [27] Generally speaking, this process tends to " reinforce the pattern of care and the board is then committed to this pattern ". [28]

Even within this process, however, change is not impossible. Hunter points out that " the emphasis

upon community health services is a good example of how change can occur, albeit gradually ". [29] This supports Smith's contention that " whether it is possible to achieve as much change as rapidly through a sequence of incremental steps as through more radical innovation depends entirely on the type of changes being defined ". [30]

This process of disjointed incrementalism [31] which Hunter finds characteristic of expenditure policy-making in Scottish Health Boards is compatible with our findings. His case study indicates that all of the important constraints are features of what Klein has called the " Organisational Process Model " [32], or what this project has discussed as government structure characteristics. Even the " Tension Points " in the process outlined by Hunter can be considered as elements of government structure at the Health Board level. [33]

It appears that policy-makers in the SHS do apply an incrementalist approach to their policy-making process, not only at the Health Board level, but also throughout the system. It might be suggested then, that it is at the level of the proximate policy-makers that goal displacement takes place. Given the resource constraints, those people closest to the centres of decision-making in the SHS apply pressure on the basis of their perceived needs. The influence of the government structure characteristics, then, appears to be one which distorts or displaces national goals with more immediate

perceived needs of those more closely engaged in the conversion process. What this suggests is a rather different phenomenon than that outlined by Dearlove. Rather than reacting to perceived needs in the environment, policy-makers may, in fact, respond to more narrow and immediate concerns and responsibilities of their closest colleagues and themselves. If this is the case, then the policy-making system runs the risk of being incapable of reacting to the citizens it was created to serve. It may be that the increased public input and the need to involve the Community Health Councils in the formative stages of policy development recommended by the Royal Commission will provide a means of alleviating this problem.[34]

The success of the policy model can best be demonstrated by its ability to explain a large percentage of the policy variation which was found to exist in Scotland. In 1976, the independent variables together explain between 60.1% and 99.8% of the total variation for the policy outputs and outcomes and, on average, explain 93.6% of policy variation. From 1971 to 1976,the independent variables combined explain from 60.1% to 99.8% of the total variation for the policy outputs and outcomes and on average, they explain 90.9% of the policy variation. If we limit the independent variables to the most influential ones involving government structure,

the model still explains a large proportion of the policy variation between health board regions. In 1976, government structure variables explain between 19% and 99.6% of the total variation for the policy outputs and outcomes and, on average, explain 77% of policy variation. From 1971 to 1976, government structure explains from 0.3% to 99.6% of the total variation for the policy outputs and outcomes and, on average, explains 71.4% of the policy variation. [35]

The discrepancies between the extent of variation explained by all independent variables and the extent of variation explained by government structure variables result from the inclusion of socio-economic and health status variables in the former case. Table X-1 demonstrates this clearly. In 14 of 18 cases, one or more of the socio-economic variables appears as one of the four most powerful independent variables. Income appears 5 times; industrialisation appears 4 times; urbanisation appears 4 times; region appears 6 times. This similarity in the frequency of appearance of these 4 variables indicates that, although in specific cases one or more of the socio-economic variables adds very little to the explanation of public policy in the SHS, in terms of the total number of dependent variables, each of the socio-economic variables adds to our understanding of policy variation between regions. In the case of health status factors,

a similar conclusion seems to be appropriate. In 14 of 18 cases, one or more of the health status variables appears as one of the 4 most powerful independent variables. Standardised mortality rates appear 7 times; infant mortality rates appear 6 times; crude death rates appear 7 times.

This result is important in the light of criticisms made of input-output studies of public policy. The model indicates that politics, as defined by government structure, does have an important effect upon public policy. This finding lends support to the research results of Sharkansky and several of the British studies of local authorities.[36] It is in direct contrast to the research results more frequently reported by scholars like Dye and Hofferbert, who find that policy variation is a function of variation in the socio-economic environment.

The explanatory power of the policy model also refutes Dearlove's criticism that output studies cannot tell us how policy is made. The results of this analysis demonstrate quite clearly that incrementalism is the dominant policy-making process of the NHS in Scotland. This cupports the case study evidence presented by Hunter and indicates that output approaches can be far more useful in this type of research activity than Dearlove has suggested.

Although this research project is an exploratory one, it has been reasonably successful in meeting its own

objectives. It provides the first examination of this aspect of health policy in Scotland. It refines output models of policy-making and it successfully explains a high percentage of the policy variation between Health Board regions.

Because it is an exploratory study, this project is also suggestive in terms of further research. Three areas which follow directly from the project are apparent.

One avenue of research involved the more detailed examination of policy change over time. Following the examples of Peters and Sharkansky,[37] further analysis might concern itself with revisions to the model which would attempt to explain policy change from interval to interval. One possibility might be to use the 1971 values of the independent variables to explain policy outputs and outcome levels for 1976. Another possibility would be to correlate changes in the independent variables over time with changes in the dependent variables over time.

A second research project might involve even greater dissaggregation of expenditures, staff and facilities. For example, hospital beds could be classified in greater detail to include coronary care beds, maternity beds, cancer treatment facilities and other, more specialised facilities. By using disease-specific mortality rates as indicators of need, appropriate ratios of demand for beds might be developed for each major

category of illness treatment facility.

Related to this is a third type of research project which attempts to determine suitable indicators of health care need. A comparative study of different types of mortality and morbidity rates, as well as multiple indicators such as Q and G indices is possible. [38] Based on the relationships between the rates determined in the dissertation project, such a comparative study would probably reveal different findings depending upon which indicator was used. By applying each indicator to bed stock requirements by region, additional useful information would be provided for Scottish Health Service planners and policy-makers

One major requirement of a doctoral dissertation is that it must make a contribution to knowledge. This research project does so in four ways. It provides a unique data base which can be used for further study of the Scottish Health Service. It provides the first systematic examination of one important feature of the NHS in Scotland. It refines and demonstrates the usefulness of output approaches to the study of public policy. It suggests related areas of further research in the important area of health policy.