

P. R. KAIM-CAUDLE **DENTAL SERVICES IN IRELAND**

The Economic & Social Research Institute

**THE ECONOMIC AND
SOCIAL RESEARCH INSTITUTE**

**Dental Services
in Ireland**

P. R. Kaim-Caudle

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P. R. Kaim-Caudle is a Research Professor with the Institute on secondment from University of Durham. The paper has been accepted for publication by the Institute. The author is responsible for the contents of the paper including the views expressed therein.

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I. INTRODUCTION

Purpose of Paper

This is the first of several papers which will be concerned with various branches of the health services. The object of these papers will be fourfold:

1. To describe the service and attempt an evaluation of its costs and benefits.
2. To compare the service with those of other countries.
3. To ascertain whether changes in the organisation of the service might increase the benefit it renders without appreciably increasing costs.
4. To assess the benefits which might be obtained if increased expenditure were to be devoted to the service.

Economic and Social Environment

This differs in many important respects relevant to the organisation and standards of health services from that of other western European countries.

1. Ireland is a small country with a population of less than three million people.
2. Almost one quarter of the population live in the Dublin conurbation, most of the remainder are widely scattered and nearly half live in settlements of less than two hundred. The population density is 40 per square kilometre.
3. The remarkable population characteristics of the Irish—a high fertility rate, a low marriage rate, a late age of marriage and a propensity to emigrate—are well known and require no elaboration.
4. The proportion of children under 15 in the population is 31 per cent, one of the highest rates in Europe (the ratio in Britain is 23 per cent). The proportion of older people over 65 is, at 11 per cent, about average by European standards.

The proportion of the population of working age is, however, exceptionally small. A hundred people aged between 15 and 65 had in 1966 to support 73 people of dependent age. The corresponding ratio in Britain was 55, in Western Germany 52 and in Denmark 54.

5. Ireland compared with its neighbours is a poor country. The national income per head is about the same as that of Italy but only some 50—60 per cent of that of Britain, Germany or Denmark.
6. Economic progress in recent years has been considerably more rapid than in the past and appreciably greater than in Britain. Between 1948—58 real product increased by less than 15 per cent while between 1958—68 it increased by 46 per cent (an average rate of 3.9 per cent per annum). The corresponding ratios for Britain were 28 per cent and 38 per cent.
7. In 1966 some 38 per cent of all males working had agricultural occupations. The predominance of the farming sector explains why only 56 per cent of the labour force are employees—the corresponding ratios for Britain are 89 per cent, Germany 85 per cent, Denmark 74 per cent and New Zealand 82 per cent.

Nature of Dental Services

Dental services are those health services which are concerned with maintaining and improving the health of teeth and related structures. Dental diseases are some of the most common forms of illness and are the cause of much misery, discomfort, embarrassment and economic loss. There are two major types of dental disease: decay of teeth known as dental caries and disease of the soft supporting tissues known as periodontal disease; the other most frequent disorder is faulty or irregular positioning of the teeth known as malocclusion. Early treatment is desirable as dental disease and disorder may impair the proper chewing of food, normal speech, facial appearance and personal relations. It is even more necessary for those comparatively rare forms of dental ill health which have systemic effects, aggravate other illnesses and in a few cases can be fatal.

All the population are at risk, for even the toothless of any age, infants as well as the very old, may suffer from inflamed and bleeding gums. Modern dentistry, quite as much as other branches of medicine, places much emphasis on prevention. There are five well proven preventive measures: (1) fluoridation of water (this

reduces the incidence of dental caries); (2) control of diet (sweet and sticky substances foster caries while raw and fibrous foods help to clean the teeth and gums); (3) brushing of teeth and gums and mouth rinsing (this reduces the incidence of periodontal disease and to a lesser extent that of caries); (4) periodic dental examination; (5) scaling and polishing of teeth.

The first of these, fluoridation, is a public health function; the second and third, diet and oral hygiene, are the subject of health education while the fourth and fifth, examination and scaling, are an inherent part of dental services. None of the five known preventive measures are easy to apply, all present a variety of difficulties which will be discussed in later sections. A sixth preventive measure, the topical application of fluoride and mouth rinsing with fluoride solutions, has shown favourable results in some experiments.

II. STATE OF DENTAL HEALTH

Surveys of Children's Teeth

In Ireland, as in most other countries, information about the state of dental health of children is more readily available than information relating to adults. This is explained by two factors: the prevalence of dental caries is much greater amongst children, and school children in any case are for all kinds of enquiries a captive population about whom it is relatively easy to gather facts.

In 1952 the Minister for Health (Dr James Ryan, T.D.) requested the Medical Research Council of Ireland to undertake a survey of dental caries amongst school children.¹ The purpose of this survey was not primarily to measure prevalence of dental caries but rather to ascertain whether there were significant differences amongst school children living in different areas of the country and whether such differences, if they existed, could be related to variations in the dietary intake of the children. When the survey was being planned it was decided to gather information also relating to the actual diet of children in different periods of their childhood and of their mothers during pregnancy and lactation. Additional information was obtained referring to the social and economic status of the children's families.

The enquiry covered about 2,265 children aged between five and thirteen. The results of the survey are summarised as follows:—

- (1) The prevalence of dental caries among school children is very high. The attention paid to the filling of teeth is negligible. Little is done to arrest the progress of decay.
- (2) The prevalence of dental caries among children in different areas does not in general show any significant difference.

The magnitude of dental caries brought out by the survey is given in the table below. Nearly half of the deciduous teeth of children aged 7–8 were decayed or missing, none of their teeth

¹ A1.

were filled; of the permanent teeth nearly one quarter were decayed. At the age between 12 and 13 when the average number of permanent teeth was already 25, more than a quarter were decayed, missing or filled. But even at this age only two permanent teeth were filled for six missing and 57 decayed.

The hypothesis that the dental condition of school children living in the Congested Districts (overcrowded areas on the west coast) were less unfavourable than in other parts of the country, could not be substantiated. This hypothesis had been based on the finding of the Nutrition Survey that the diet in these areas was simple and plain.

The survey also did not confirm the view that dental caries related to social class. For children living in three areas of Dublin city having different social composition, designated respectively as slum, artisan and middle class, the DMF rate (decayed, missing and filled teeth as a proportion of all teeth) for 12-13 year olds showed no marked difference. Even for children from the middle class area (Glasnevin and Drumcondra) the number of filled teeth was less than 10 per cent of those decayed and missing. An analysis by family income per head per week appeared to confirm these findings.

Between 1961 and 1963 the Minister for Health (Mr Sean MacEntee) requested the Medical Research Council of Ireland to carry out a survey of the incidence (prevalence) of dental caries in a representative sample of pupils attending full time day schools in the areas of all the 27 health authorities. This was in compliance with the provisions of the Health (Fluoridation of Water Supplies) Act, 1960. The results of these surveys which are summarised in Table 2, confirmed the prevalence of dental caries found ten years earlier. However, the more comprehensive and elaborate surveys of the 1960's showed a higher prevalence of caries in Munster than in the other three provinces. This may be due to geological factors and their effect on the chemical composition of the water.

The broad generalisation that half the deciduous teeth of the seven year olds and a quarter of the permanent teeth of both the seven and the twelve year olds are decayed, missing or filled, appears as true for the early 1960's as it was for the early 1950's.

Survey of Old People

Very little is known about the state of dental health of adults. Dr Corridan, in 1965, carried out a survey of 506 old people, above the age of 65, in the chronic sick wards of St Finbarr's Hospital, Cork, the County Home in Midleton and three cottage hospitals

Table 1

Average number of defective teeth per child in Ireland 1952

Age	Deciduous Teeth						Permanent Teeth							
	Total No.	Sound No.	De-cayed* No.	Missing No.	Filled No.	DMF*		Total No.	Sound No.	De-cayed* No.	Missing No.	Filled No.	DMF*	
						No.	%						No.	%
5-6	19.3	12.4	6.4	.5	—	6.9	35.8	1.5	1.2	.3	—	—	.3	20.0
7-8	14.2	7.6	5.8	.8	—	6.6	46.5	9.0	6.7	2.2	—	—	2.2	24.4
12-13	1.3	.7	.6	—	—	.6	46.2	25.1	18.6	5.7	.6	.2	6.5	25.9

Note: DMF is a dental term referring to decayed, missing and filled teeth.

*These include teeth in which sites of caries of grade THREE or more were included i.e. the American method for charting records.

SOURCE:

Dental Caries in Ireland Report, 1952, Table 2, Medical Research Council of Ireland.

Table 2

Average number of decayed—missing—filled teeth (DMF)* for children at specific ages in selected areas

Age	Deciduous Teeth					Permanent Teeth				
	1952	1963				1952	1963			
	Dublin	Dublin	Cork	Limerick	Waterford	Dublin	Dublin	Cork	Limerick	Waterford
5-6	6.1	5.7	7.0	7.1	6.8	.1	NA	.1	.1	.1
7-8	6.6	6.5	7.6	7.1	7.3	1.1	NA	1.4	1.1	1.5
12-13	.4	—	.5	.3	.03	4.6	6.1	5.7	5.0	5.7

*These include teeth in which only sites of caries of grade FOUR or more were included, i.e. the British method of charting records.

SOURCE:

1952: Dental Caries in Ireland Report, 1952, Table 2, Medical Research Council of Ireland.

1963: Health (Fluoridation of Water Supplies) Act, 1960—Cork, Limerick and Waterford, Report by the Minister for Health Table XI, and Table IV.

NA—Not available.

in County Cork.² A small facet of this survey was concerned with the dental state of elderly patients. His findings are summarised in Table 3 below. He defines natural teeth as adequate if there are six or more teeth in reasonable alignment. It is interesting to note that the proportion of females having dentures is almost three times as great as that of males, while the proportion of women who are completely edentulous (without teeth) is somewhat smaller (but the difference is not statistically significant). The overwhelming proportion of the patients in these hospitals come from the lowest social class and they are not representative of all old people in Ireland, nor are the ages of these institutional patients typical of the population aged over 65. The proportion of very old people amongst these patients was very large and they are, therefore, also in this respect unrepresentative of old people above the notional retirement age of 65 years.

Table 3

The dental state of the elderly in county homes and cottage hospitals in Cork, 1965

	Men	Women
	%	
Edentulous	50	43
Dentures but did not use them	5	5
Inadequate teeth	26	15
Adequate (6 or more) natural teeth	7	4
Upper/Lower dentures	12	34

SOURCE:

Paper by John P. Corridan, M.D., D.P.H., in the Journal of the Irish Dental Association, Vol. XI, No. 6.

Army Cadet Candidates, Apprentices and Recruits

The only other two groups of adults for whom information on their dental condition could be obtained were (1) Irish Army Cadet Candidates and (2) Irish Army Apprentices and Recruits. The Director of the Army Medical Corps and the Assistant Director in charge of dental services have provided data relating to 287 cadet candidates aged about 18, 124 apprentices aged 16 and 167 recruits aged between 17 and 18. The social background of the cadet candidates is so different from the others that they are best considered as a separate group.

² A2.

Table 4
Dental condition of Irish army cadet candidates, apprentices and recruits, 1966

Number	Cadets			Apprentices			Recruits		
	287			124			167		
<i>State of Teeth:</i>									
Average DMF Teeth per Man	12.9			14.2			15.0		
% with 15 or more DMF teeth	28			40			53		
Treatment Received	D	M	F	D	M	F	D	M	F
Average Teeth per Man	4.7	4.2	4.0	6.7	5.9	1.6	7.0	6.1	1.8
% with no teeth	16	8	37	1	—	60	4	1	60
% with 5 or more teeth	50	43	34	76	66	14	74	62	16
Treatment Required	E		F	E	F		E	F	
Average Teeth per Man	.3		4.3	.8	6.0		1.5*	6.8*	
% requiring 5 or more	—		48	—	66		—	79*	
% requiring 1 or more	18		—	43	—		60*	—	

N.B. D—Decayed M—Missing
 F—Filled E—Extraction.

*Refers to 147 recruits but not the same as in the other parts of the table.

Note: The age of the Cadets is about 18, that of the Apprentices 16 and that of the Recruits 17–18. Amongst the Cadet Candidates 35 were examined in 1968.

SOURCE:

Letter from Department of Defence dated 7th February 1969.

The average number of decayed, missing and filled teeth (DMF) which is mainly an indication of the prevalence of caries is somewhat lower for the cadets at 12.9 than for the apprentices and recruits (about 14.7) (See Table 4). The relative magnitudes of decayed, missing and filled teeth are an indication of treatment received in the past. The figures show that the number of missing teeth is some 30 per cent less for the cadets than for the other two groups. The cadets also have on average two and a half times as many fillings as the others and have many fewer decayed teeth. In general there is clear evidence, as indicated by the smaller number of missing and the larger number of filled teeth, that the cadets have received more dental care. The assessment of treatment required is for a different group of recruits. The cadet candidates are shown to require less than half of the number of extractions but as much as 70 per cent of the fillings needed by the apprentices. All the same, the cadet candidates require on average more than four fillings and almost half of them require five or more fillings. The apprentices need on average six fillings and two-thirds require five or more fillings. The recruits who on average are two years older than the apprentices require 6.8 fillings and four-fifths of them require five or more fillings. A fifth of the officer cadets, two-fifths of the apprentices and three-fifths of the recruits require at least one tooth extracted. Already in their teens the apprentices and the recruits have more than seven teeth missing (including teeth which ought to have been extracted).

In assessing the meaning of these figures two factors should be borne in mind. All these young men are volunteers and may well be in better general health than others of the same age. Secondly, the cadet candidates know that dental fitness is one of the requirements for acceptance by the army and virtually all of them received dental treatment a few months before their army dental examination. This, of course, would not affect their DMF rate but certainly does decrease the number of decayed teeth and increase the number of filled teeth. It might be mentioned that these figures are based on an examination by probe and mirror without an X-ray. As indicated in the table there is a considerable dispersion around the mean.

III. DENTAL MANPOWER

The Dental Register

The Dentists Act, 1928, paragraph 45, lays down that "it shall not be lawful for any person to practise or to represent or hold himself out whether directly or by implication as practising or being prepared to practise dentistry or dental surgery unless such person is a registered dentist". Persons may have their names placed on the Register if they possess a degree or licence in dental surgery granted by a university or college in the Irish Republic, which has been granted the power to issue such awards. The three bodies which at present issue licences in dentistry are the Royal College of Surgeons, the University of Dublin (Trinity College), and the National University (UCD and UCC).

The Act permitted the practice of dentistry also to three other groups of persons:

- (1) Those whose principal means of livelihood during the ten years immediately preceding the passing of the Act was dentistry. This now represents a very small proportion of practitioners—5.3 per cent.
- (2) Registered Medical Practitioners and in emergencies, for the extraction of teeth only, a pharmaceutical chemist.
- (3) Persons holding dental qualifications from other countries, usually on a reciprocal basis.

The Act specifically permits the employment of mechanics or apprentices by a registered dentist to carry out any work which is usually done in a dental workshop.

The Dentists Act restricts the practice of dentistry to a small group of professional people. No other person is permitted to perform any operation in the oral cavity even if this does not require the use of instruments. At present newly qualified dentists must have received a post-secondary education of a minimum of five years and one term, at least two years and one term of which were spent at a dental hospital.

It is interesting to note that the practice of medicine is not restricted to anything like the same extent. Registered medical practitioners are qualified by law to sign medical certificates, prescribe certain dangerous drugs and practise midwifery, otherwise an unregistered person may give medical treatment but may not be employed in the public service as a medical practitioner.

Medical services are rendered by persons who need not have any formal qualifications at all such as osteopaths (practitioners of manipulative surgery, colloquially known as bone setters), homeopaths (colloquially known as herbalists) or lay psychoanalysts concerned with healing mental disturbances. Members of the medical auxiliary professions such as midwives practising obstetrics, nurses giving injections and syringing ears, radiographers taking X-rays, opticians testing eyes and prescribing glasses, all undertake work which may be and often is undertaken by a medical practitioner.

Numbers and Distribution

The number of registered dentists on the 31st December was at no time since 1951 less than 600. Between 1951 and 1956 it gradually increased from 600 to 682, between 1956-61 it declined to 630 and since then increased steadily until 1967 when it was 712. These figures are based on practitioners who pay their annual registration fee and represent the total number of people who were on the Register at any time during the year, not the actual number practising dentistry full time during that year. Some dentists will have died, some may have retired and others emigrated during the preceding 12 months. Nor are all dentists on the Register working full time; some are married women working part-time, others are in semi-retirement, others are known to have retired completely but maintain their registration all the same.¹

In 1968, of the total number of dentists registered, 93 or about 14 per cent are female. (See Table 5.) Dentistry is a rather youthful profession. If one assumes that the active working life of a dentist is about 40 years, between 24 and 64, then almost two-thirds of all male dentists and three quarters of female dentists are in the younger half of working age. About one-tenth of all registered dentists are above the age of 65, the normal retirement age for professional men in the public service.

Rather less than one-fifth of all dentists but possibly as much as a quarter of all full time active dentists are employed in the public service—by the Defence Force, by the two teaching hospitals, by

¹ B1.

Table 5

Registered dentists and local health authority dentists, 1968

Age Groups	All Dentists				Local Health Authority Dentists*			
	Men		Women		Men		Women	
	No.	%	No.	%	No.	%	No.	%
20—24	27	5	4	4	—	—	—	—
25—29	95	16	18	19	9	12	9	32
30—34	69	12	14	15	17	22	10	36
35—39	112	19	22	24	13	17	3	11
40—44	68	12	11	12	11	14	1	4
45—54	89	15	8	9	11	14	2	7
55—64	66	11	12	13	9	12	1	4
65—70	46	8	2	2	2	3	—	—
70+	18	3	2	2	1	1	—	—
Age unknown	—	—	—	—	4	5	2	7
Total	590	100	93	100	77	100	28	100

*In full-time employment.

SOURCE:

The Dental Register of Ireland, based on the assumption that dentists qualify at the age of 23, and the Local Health Authority Returns to the Department of Health.

the government but most by the local health authorities. The age of local health authority dentists is even more youthful, about 65 per cent of men and 83 per cent of the women are in the first half of their working life.²

Any estimate of the number of people per dentist is liable to appreciable error. The population per registered dentist is 4,200 but this figure has very little meaning as the number of non-active and semi-active registered dentists is not known. The population per dentist working full time is more likely to be 5,000 and per dentist in private practice will be in the region of 6,200.

The geographical distribution of dentists is very uneven. The population per dentist in the Dublin County Borough is about 2,600 and in Cork County Borough 2,300. These figures are, however, distorted by Dublin dentists providing services for a number of patients in the surrounding counties and by the concentration of dentists in public employment in these two cities. The population per dentist in Connacht, including those in public employment, is 6,600 and in the three counties of Ulster it is only very slightly less.

² B2.

Dental Education

Four colleges offer full courses in dentistry, UCD, TCD, and the RCSI in Dublin and University College, Cork; University College, Galway, offers the pre-dental course only, after which students transfer to UCD. The length of the course at TCD and RCSI is six years, of which the first three years are common to medical and dental students. The courses at the National University of Dublin and Cork are five years and a term. All undergraduates in Dublin receive their clinical training at the Dublin Dental Hospital where they attend for two years and one term. Cork students receive their clinical training at the Cork Dental Hospital. In the early 1960's the British General Dental Council reported unfavourably on the general organisation of dental teaching and clinical training of dental students and there was a possibility of it recommending to the Privy Council the withdrawal of recognition. This would have meant that Irish graduates would not have been permitted to practise in the United Kingdom but would not have affected their right to practise within the State.

From some points of view this withdrawal of recognition might have been favourable to the country. Irish dentists would have had to work at home and this might have led to a highly desirable increase of dental services and almost certainly to a lowering in the cost of providing these services. Withdrawal of recognition would have resulted also in some actual and potential disadvantages. It might have been the thin edge of the wedge leading to the withdrawal of recognition of other university and professional qualifications especially in medicine and most important for arts graduates as qualified teachers. It might also have discouraged Irish men and women from studying because of the reduced earning prospect in that profession if they were confined to practise within the State. Finally, the criticisms of the General Dental Council were recognised as well, founded and the continuation of the pre-1961 conditions would have led to a deterioration of dental standards. These conditions are possibly best illustrated by the fact that the salary of the ten part-time members of the staff in Cork dental hospital in 1962 came to a total sum of £900. This included two professors and five lecturers. As a result of the unfavourable report of the General Dental Council the organisation of the Dublin Dental Hospital was greatly modified and the hospital itself completely reconstructed and re-equipped.

The number of dental students qualifying in the pre-war years was about ten per year, but had increased by 1960-61 to as many as 68. In recent years this number has declined and is now in the

lower fifties. Dentistry is a less popular subject than medicine and at TCD and the RCSI where students take the same course for the first three years many who started off intending to take dentistry change their minds. At the National University this is not possible as dental students take a different course after the first year.

Table 6
Intake of students into the Dublin Dental Hospital, 1965-1971

Year	Number	Year	Number
1965	45	1969	25*
1966	39	1970	34*
1967	40	1971	37*
1968	34		

*Projected on students in 3rd, 2nd and 1st year of dental course.

SOURCE:

Letter from Secretary of Dublin Dental Hospital, 22nd February, 1969.

The intake of students into the Dublin Dental Hospital between 1965 and 1968 and the anticipated intake between 1969 and 1971 are shown in Table 6. The reduction over the years leading to an intake of a mere 25 in 1969 is mainly due to the Royal College of Surgeons and Trinity College failing to take up their quota of fifteen and six places respectively. The sudden reduction in the number of students which has taken place since 1968 is the result of a decision by the Council of the Royal College of Surgeons, which was later rescinded, to shorten the pre-clinical course. As this would have meant that two years of students would arrive at the clinical part of the course simultaneously the College accepted no dental students for a year. Partly as a result of these changes in policy the number of students applying for the dental course at the College has declined. In any case most students who wish to study dentistry may well prefer the shorter course at UCD leading to a degree than the longer course at Trinity or the equally long course at the RCSI leading to a licentiate. It is not expected that the decline in the number of students will be permanent but even the anticipated intake for 1971 of 37 students is nine less than the quota. The cost per student is, of course, greatly increased if in a hospital meant to cater for an intake of 47 students some 20 per cent less present themselves.

At present the Government is committed to build (1) a new dental hospital in Dublin for an annual intake of 50 students, at a cost which was estimated at £1m in the early 1960's and (2) a

dental hospital in Cork for an annual intake of 25 students at a cost which was then estimated at £750,000. The present annual net cost of the Dublin Dental Hospital is about £211,000, of which £63,000 is borne by the Hospitals Trust Fund and £148,000 by the Department of Education. The hospital receives a grant of £5,000 from the Dublin Health Authority for providing dental treatment for the lower income groups (the value of this treatment is assessed at £10,500). Other items of income include £1,200 from the Dublin Health Authority for treatment of National School Children and £8,000 from private patients. The total staff of the hospital includes five full-time professors, seven junior consultants and one senior consultant, six registrars, four house surgeons as well as some 40 part-time dental surgeons. Assuming that the teaching cost is that share of the hospitals expenses borne by the Department of Education and that the total number of students averages about 90, the cost per student per year is £1,550 or about £3,500 for the seven terms he spends at the dental hospital. Well under a tenth of this cost is covered by the fees paid by the student. It may well be that the share borne by the Hospitals Commission includes some of the cost of undergraduate teaching and that the above estimates are therefore too low.

Over the last ten years several proposals for the location of the new Dublin Dental Hospital have been discussed. The Board of the hospital considered a site at the Mater Hospital, at St. Kevin's and at the new St. Vincent's Hospital at Elm Park and decided in favour of the Mater site. When planning permission for this site was refused they reconsidered the relative advantages of St. Kevin's and Elm Park and opted in favour of Elm Park. The reason for this decision was a desire by the Board and the staff of the hospital to be associated with one of the undergraduate medical teaching hospitals. The site selected is in one of the most prosperous areas of Dublin and far from any of the big housing estates. A dental hospital is concerned virtually only with out-patients and therefore its situation in a reasonably accessible location for its potential clients is a matter of some importance. For this reason St. Kevin's Hospital grounds would have been preferable but was not acceptable to the Dental Hospital Board as it was at that time not a teaching hospital. It is a delicate question to decide whether proximity to a teaching hospital or proximity to its clients is the more important. The members of the Dental Hospital Board may possibly give more weight to one rather than the other of these advantages.

As regards the dental hospital in Cork there are great and obvious advantages in not concentrating all educational facilities in the

capital city. It is also widely felt that the existence of a dental hospital does have a beneficial effect on the standard of dentistry practised in the region where such a hospital is situated. All the same, the wisdom of building a dental hospital in Cork is doubtful. This would involve a capital cost of £13,000 per student place per year, i.e. £30,000 per student graduating. Expressed in a different way, the annual capital cost (assuming capital charges to be 10 per cent) per student will be not much short of £1,300 or £3,000 per student graduating. All these figures are based on building costs in the mid-1960's.

A dental school with an intake of 25 students per annum may well be an uneconomic unit. If it were desired to have 75 students per year qualifying the cost might well be lower, and possibly appreciably lower, if all teaching was concentrated in Dublin.

The sums of money involved are so large, the issue of policy so important, that even at this late stage it may be desirable to appoint a committee to consider afresh the arguments in favour of two rather than one dental hospital in the State.

A large number of dentists go to work abroad as soon as they qualify. A certain proportion of these return at a later stage but a substantial number do not. How far it is reasonable and desirable for the Irish State and the Irish people to educate large numbers of men and women to be dentists who later emigrate, is a delicate political question. The extent to which dentists return to this country after having worked for a time abroad is discussed in detail in Appendix I.

IV. ORGANISATION OF DENTAL SERVICES

In Ireland three groups of the population are entitled to free dental services: most employees are insured compulsorily under the Social Welfare Acts; children attending child welfare clinics or at national schools; and the holders of medical cards—the so-called lower income group.

Social Insurance Treatment Benefit

The great majority of persons insured under the Social Welfare Acts have coverage for dental benefit. Such persons are mainly employees who are engaged in a manual capacity or, if engaged in a non-manual capacity, earn less than £1,200 per annum. Dental benefit covers fillings, scaling and extraction without any charge to the patient. Dentures are provided as a benefit subject to the patient paying approximately two-thirds of the cost. Persons under 21 years of age are qualified for dental benefit on the payment in respect of them of 26 employment contributions. This means that persons starting work at 16 years of age can become entitled to benefit after having been employed for six months. Persons over 21 years of age must have had at least 156 employment contributions paid in respect of them to qualify. This represents roughly three years employment. In addition they must have 26 paid or credited employment contributions in the contribution year which governs the benefit year of claim.

The number of men entitled to benefit is approximately 467 thousand, and women, approximately 243 thousand.¹ The number of claimants over the last seven years has increased by about 50 per cent (see Table 7). During this period in which the regulations giving entitlement have remained unchanged, the number of insured persons entitled to benefit increased by only 13 per cent. The claims by men increased from 48,000 to 70,000 and those by

¹ C1.

women from 53,000 to 79,000. The proportion of men annually claiming dental benefit is about 14 per cent and that of women as much as 30 per cent of those entitled.

Table 7

Dental benefit claims received under Social Welfare Acts, 1961-62—1967-68

Year	Men		Women	
	No. 000's	Index 1961-62=100	No. 000's	Index 1961-62=100
1961-62	47.8	100	52.7	100
1962-63	48.2	101	51.3	97
1963-64	49.0	103	56.1	106
1964-65	53.8	113	61.2	116
1965-66	59.6	125	66.0	125
1966-67	67.8	142	73.8	140
1967-68	70.4	147	79.1	150

SOURCE:

Department of Social Welfare letter dated 7th January 1969.

It is interesting to note that men and women receive quite different types of treatment. Amongst women claiming benefit, 39 per cent receive treatment which involves fillings only and 13 per cent have extractions only. The corresponding proportions for men are quite different, 25 per cent for fillings and 21 per cent for extractions. Treatment involving the supplying of dentures is required by 27 per cent of the men but only 20 per cent of the women. There appears to be no clinical reason why men should receive different treatment from women. The only explanation which fits the facts is that women are more interested in having a clean mouth and in keeping their teeth.

An analysis of the age of claimants (see Table 8) clearly shows that for both men and women the proportion claiming is inversely related to age. There is a noticeable decline in claims after the age of 30—58 per cent of all male and 76 per cent of all female claims are by persons below this age. For all ages the proportion of those entitled who claim dental benefits is decidedly higher amongst females than amongst males. The excess of female over male claims is about 80 per cent for ages under 40 and for all ages is 117 per cent. The relation of benefit claims to age and sex as well as the strong upward trend in the claims received in the last few years are relevant in estimating the cost of a possible extension of free or subsidised dental services. The rise in claims over the last few

Table 8

Dental benefit claims paid under Social Welfare Acts analysed by sex and age in the year 1967-68

Age	Men			Women		
	No.	Proportion of Total Claims	Claims per 100 Insured	No.	Proportion of Total Claims	Claims per 100 Insured
	000's	%		000's	%	
Under 21	14.0	22	20	26.5	36	38
21—25	12.6	19	21	19.4	26	38
26—30	10.4	16	23	10.4	14	41
31—35	6.8	11	17	4.5	6	30
36—40	5.2	8	13	3.2	4	22
41—45	4.2	7	10	2.5	4	18
46—50	3.6	6	8	2.4	3	18
51—55	3.0	5	7	1.7	2	13
56—60	2.4	3	7	1.4	2	12
61—65	1.3	2	5	.9	1	10
66—70	.7	1	4	.5	1	8
70+	.3	.5	—	.2	.2	—
Total	64.5	100*	14	73.5	100*	30

*Due to rounding off the individual proportions do not add exactly to 100.

SOURCE:

Department of Social Welfare letters dated 24th December 1968 and 7th January 1969.

years shows a marked increase but does not appear to follow any regular pattern. The regional distribution of claims for dental treatment benefit shows that the number per 1,000 people entitled is substantially greater in the Dublin area and Leinster than in Connacht and the three counties of Ulster. This discrepancy however is very probably due to the larger proportion of females amongst insured persons in the Dublin area and to a lesser extent, is a reflection of generally higher standards of living.

The expenditure on dental treatment benefit was £606,000 in 1967-68, of which about 10 per cent was in respect of partial payment for dentures. The average cost to the Department per claim was about £4-8 and per person insured 18/-. The average payment received by a dentist from the Department under this scheme was £1,200 per year plus £250 per year as the patients' contribution to the cost of dentures. It appears that virtually all dentists in private practice are on the Department's panel, but the payments made to individual dentists would depend on the extent of their participation in the scheme.

Child Dental Services

The second group of the population entitled to free dental treatment is the vast majority of children under fourteen. Under Section 20 of the Health Act, 1953 and Part 5 of the Maternity and Child Health Services Regulations, 1954, health authorities have to provide dental treatment and appliances for defects discovered in child welfare clinics or at examinations of pupils at National Schools. Dental treatment for children under five is very exceptional and for all practical purposes the only children treated are from amongst the half-a-million children who attend National Schools.

The nature of the treatment received, by any standards, is fairly rudimentary. About one-third of all children in National Schools have a dental examination during the year. The total number of deciduous teeth extracted under this scheme in 1967 was 151,000 while the number filled was 13,000, i.e. twelve deciduous teeth extracted for every one filled.² The rate for Dublin was rather more favourable, about six teeth extracted for every one filled, while in other counties, for example Kerry, Offaly, South Tipperary and Cork, fillings of deciduous teeth were so rare as to be virtually non-existent. The total number of permanent teeth extracted was 79,000 compared with 125,000 filled, i.e. 1.6 fillings for every extraction. Here again the rate for Dublin was better—2.4 teeth filled for every one extracted—while in Kildare 0.4 teeth were filled for every one extracted, the corresponding rate for Waterford was 0.6 and for Westmeath 0.3. On the basis of these statistics it appears that about 140 permanent teeth are extracted and 220 filled for every 100 National School children before they reach the age of fourteen. The number of teeth decayed but not treated, on the basis of the Medical Research Council's findings in 1963, would thus be at least 250.

In every local health authority area the dental treatment children receive is clearly unsatisfactory though it is more unsatisfactory in some areas than in others.

Total public expenditure on dental services for children in 1967–68 was £342,000, say 14/- per year for every child attending National School (it is assumed that the expenditure on dental services for pre-school children is minimal). The cost per child varied considerably between counties—in Donegal it was as little as 6/-, in Clare 8/- per year while in Limerick it was 16/- and in Longford 18/-. These differences are partly the result of difficulties in filling established posts and of the dental facilities

² B2.

available. Like all other social services the costs for highly scattered populations are of course larger than for densely populated urban areas.

Lower Income Group Services

The third group of persons entitled to free dental services is the lower income group. These persons are defined in the Health Act, 1953 as persons who are 'unable to provide by their own industry or other lawful means the medical or surgical treatment or medicines, or medical or surgical appliances necessary for themselves or their dependents'. Under Section 14 of this Act dental treatment and such appliances as dentures may be provided free. At present such dental services exist only in a very restricted form. Approximately 30 per cent of the population are classified as belonging to the lower income group. About one third of these may be assumed to be children who already are covered for dental treatment if they attend National Schools or child welfare clinics. The adults eligible for free dental treatment are thus about one fifth of the total population, say 580,000 persons, of these 38,000 had a dental examination in 1967. The total number of teeth filled for this population was four thousand, while the number of extractions was 80,000. The total number of dentures supplied was about 7,000 and it requires no elaboration to show that this service is quite inadequate and that large numbers of people who require dentures do not receive them. The total of 4,000 persons, who, according to local health authority returns to the Department of Health, are on the waiting list for dentures, is a reflection on the way the service is provided rather than an indication of need.

The shortcomings of the service are referred to in the White Paper on 'The Health Services and their Further Development' published in 1966.

'Because of shortage of personnel and the high incidence of dental caries, the dental services of the health authorities fail to cater adequately for the needs of all the persons at present entitled to them and a system of priorities has been applied in the services. First priority is given to children. Others who require treatment for medical reasons are next in the order of priority. The operation of this priority system results in unavoidable delays in the provision of dental treatment for some persons in the eligible classes, particularly for those in neither of these two categories. Similar delays occur in the provision of dentures for eligible persons.' Para. 95.

The local health authorities, particularly in Dublin and Cork, make grants to persons entitled to treatment benefit under Social Welfare Acts to enable them to pay for their share of the cost of dentures. The aggregate expenditure under this heading came to £15,000 in 1967.

The total expenditure on dental treatment for adults belonging to the lower income group was £110,000 in 1967-68, approximately 4/- per year per person entitled. The services to the lower income group are provided by the same staff who look after National School children—full-time dentists, supplemented, to a fairly limited extent for adults, by general dental practitioners. (See Appendix III.)

Staff of Public Services

The health authorities provided dental services in 1967 for eligible children and the lower income group through 77 male and 28 female full-time dental officers. (The maximum salary for senior dental officers is £3,002 and for public dental officers £2,565 at present.)

In addition to the full-time staff, local health authorities contracted with general dental practitioners to provide services for children on a sessional basis. In 1967, forty-six dentists gave 468 sessions per month in health authority clinics and forty-eight dentists gave 333 sessions per month in their own surgeries. The fees for these three hour sessions were £6 for a dentist working in his own surgery (from April 1968 it was increased to £8), and £4 15s. if he worked in a health authority clinic. The aggregate payment to private dental practitioners for local health authority work was some £50,000.

The 800 sessions per month are equivalent to approximately 22 dentists working full-time. The notional number of full-time dentists is thus 127, giving a ratio of about 4,000 children per school dentist in 1967-68. It is estimated by the World Health Organisation that to provide a satisfactory standard of service for school children requires one dentist for every 500-700 children.³

Appointment of Dentists

Public dental officers are recruited centrally by the Local Appointments Commission and recommended to Local Authorities for appointment. Their appointment after recommendation is almost automatic.

In the first nine months of 1968 nine women and 31 men

³ c2.

dental surgeons were recommended for appointment to various local authorities. Half of these were merely transfers of public dental officers from one health authority to another. Eleven of the nineteen transferred moved to Dublin, Cork or Limerick. Two others came from outside public services—one from Britain and one from Northern Ireland. Eighteen dentists transferred from private practice—nine from within the State, one from Northern Ireland and eight from Britain. Only two dentists recruited from private practice were above the age of 45, and another four were between 40 and 44 leaving twelve recruited from private practice under the age of 40.

Not all vacancies advertised could be filled; six applicants were not recommended for appointment. These included some who were considered as unsuitable for employment, others who had competed for posts where there was an excess of candidates. Amongst those not recommended two were over 45 and one between 40–45. During the same period two recommendations were made for senior dental officers, both of whom came from the public health service in the State. The competition for these appointments was rather keen—27 applications were received, 19 from public dental officers, of whom 13 were from within the State, four from Northern Ireland and two from Britain. Amongst the candidates for senior appointments was one woman.

Table 9

Regional distribution of public dental officers, April 1969

	Approved Posts No.	Vacant Posts No.	Proportion of Vacant Posts %	National School Children per Approved Post
Leinster	61	5	8	3,972
Munster	46	11	23	3,241
Connacht	22	5	23	3,206
Ulster (three counties)	12	6	50	2,884
	141	27	19	3,500

SOURCE:

Communication from the Department of Health, letter dated 13 May 1969.

At the end of April 1969 out of 141 approved posts of public dental officers 27 were vacant. The proportion of posts vacant (see Table 9) was only 8 per cent in Leinster but as high as 50

per cent in Ulster (three counties). The number of children per established post was rather lower in Ulster than in Leinster. This may be due to the fact that the sparsity of population requires the dentist to spend much more time in travelling.

The difficulty of recruiting dentists to the public service is likely to be due not to one but to a number of factors. Amongst these the scope for higher earnings in private practice in Great Britain and at home is certainly important. The English public service, though salaries are broadly similar, has a number of advantages. There are greater opportunities for promotion to senior posts, increments for previous experience in private practice are more liberal and certain fringe benefits are more generous. Lastly, positions in rural Ireland appear to be less popular than posts in English towns, though both carry salaries which are more or less the same.

Private Practice

The total number of private practitioners practising full-time in the State is equivalent to about 430. This figure is based on a paper prepared by the Secretary of the Irish Dental Association in 1968 and on the assumption that two part-time dentists or four semi-retired dentists are equal to one working full-time. It excludes a notional 22 dentists in respect of the 800 sessions per month which private dentists work for the school dental service.

About the work and income of these dentists virtually nothing is known. There appears to be an understanding on a regional basis to agree on certain minimum fees for different operations. It is the nature of such agreements that they are difficult to substantiate. However, an article by Lucius McClean, O.F.M., under the title 'Professional Fees' which appeared in the Journal of the Irish Dental Association, April 1965, is at least circumstantial evidence. In this article, which is reprinted from the *Sunday Independent*, Father McClean discusses the ethical position of professional men being required by their association to charge minimum fees and their obligations of charity towards those who cannot afford to pay these fees. In any case minimum fee agreements of this kind can only be a gentleman's understanding. They cannot be enforced easily nor is any form of sanction readily available. The fact of undercutting is also difficult to substantiate.

The present salary of public dental officers is £2,565 per annum plus the employers' contribution to the superannuation scheme of approximately 8 per cent. The total gross salary is therefore about £2,760. The Local Government Appointments Board experiences

considerable difficulty at that salary level to fill all vacancies in the public service. Even in the Dublin area recruitment is difficult and in the West it is even more so. This is the case even though the recruitment for public dental officers has now been extended to the age of 55. Irish remuneration for public dental officers is at present much the same as that in Northern Ireland and England, though at times it has been lagging behind. It is therefore of interest to note the views of the Review Body on Doctors' and Dentists' Remuneration in their Ninth Report published in May 1968:

'while it was clear that over the age span of the profession as a whole recruitment to the salaried dental services was markedly better than it was to the general dental service . . . while this may be so the bias suggests that the salaried services may possibly be more attractive, for whatever reason, than the general service, perhaps, as the profession's representative suggested, for the older dentist in particular'.⁴

The work of public dental officers is not exceptionally arduous. It may therefore be argued *prima facie* that dentists in private practice who are not interested in joining the public service either are enjoying, or expect ultimately to enjoy, higher incomes in private practice than in public employment. Due allowance in individual cases must of course be made for family and personal circumstances. A man with three or four children at school would obviously experience difficulty in giving up a private practice and moving to another area of the country as a public dental officer. The pattern of vacancies is, however, so widespread that personal circumstances cannot be the explanation for the reluctance of private practitioners to join the public service.

In the United Kingdom general dental services it is estimated that 57 per cent of a dentist's gross earnings is spent on covering expenses.⁵ If it is arbitrarily assumed that the corresponding rate in Ireland is 50 per cent one can conclude that the average gross income of dentists in private practice is at least about twice that of a public dental officer, say of the magnitude of £5,500 to £6,500 per year. In strict logic this would be the minimum income of dentists in private practice; allowing for unwillingness and inability to move, preferences for certain localities and similar factors referred to by economists as friction, it is conservatively assumed that the £5,500 to £6,500 is the average; the actual average almost certainly will be higher.

⁴ C3, para, 165.

⁵ C3, para, 175.

The average number of hours worked annually per principal in the British dental services is 2,000 and in 1963 was as high as 2,120.⁶ No evidence is available to ascertain whether Irish dental practitioners work the same, shorter or longer hours.

⁶ C3, para. 176.

V. DENTAL HEALTH AND SERVICES IN OTHER COUNTRIES

For the purpose of better understanding the nature of dental services in the State it is of interest to review briefly the position in some other countries. This will also make it possible to judge in what ways and to what extent measures, regulations and practices employed abroad could usefully be adopted here. The four countries which will be reviewed are Northern Ireland, on account of its proximity, Denmark, a small country having well developed social services, New Zealand, another small country which has some exceptionally interesting features in public dental services, and finally the United States, a rich country which relies mainly on private dental services.

Unfortunately the nature of the information about dental health and dental services is not the same for all countries. Even if the information available for two countries is the same it is often misleading to make a comparison. Thus the DMF rate can be assessed in a number of ways which give quite different results, for example, inspection using mouth mirror and explorer only cannot discover proximal caries which can only be detected in the early stages by X-ray. Even the number of dentists is recorded differently and there is the additional problem of ascertaining the proportion of dentists working full-time. For all these reasons no attempt is made to compare countries with each other but for each country as much information is given as is readily available.

NORTHERN IRELAND

Manpower

The Northern Ireland Government, according to the Province's constitution has power to decide on the nature, structure and quality

of social services. The services need not be the same as those in other parts of the United Kingdom. It has, however, been the policy of all Northern Ireland Governments since 1922 to provide social services virtually identical to those of England and Wales. This applies as much to dental as other services.

There is no separate dental register for Northern Ireland. Dentists have to be registered with the General Dental Council for the United Kingdom. The number of dentists in the province in 1967-68 is estimated to have been 506, excluding dentists employed in the armed services. The distribution of dentists was approximately 398 in general practice (including 72 assistants), 65 in the school dental service and 43 in hospitals and government services.¹ The population dentist ratio is about 3,000 to 1. The population dentist ratios of different countries are difficult to compare as not all registered dentists are working full-time.

In Northern Ireland two types of ancillaries are permitted to practise dentistry in a restricted field. The Dentists Act (1957) empowered the General Dental Council of the United Kingdom 'to make regulations establishing a class of dental hygienists who, on qualification, are entitled to enrolment in the roll of Dental Hygienists held by the Registrar of the General Dental Council. Qualification refers to holders of the Certificate of Proficiency in Oral Hygiene awarded by the Minister of Health or the Certificate of Proficiency in Dental Hygiene awarded by the Central Examining Board for Dental Hygienists'. Under the Ancillary Dental Workers Regulation (statutory instrument [1968] No. 357) 'a dental hygienist shall not be permitted to carry out dental work amounting to the practice of dentistry except (a) under the direction of a registered dentist; and (b) after the registered dentist has examined the patient and has indicated to the dental hygienist the course of treatment to be provided for the patient'. The regulations also provide that: 'except in the course of providing national or local authority health services, a dental hygienist shall carry out dental work amounting to the practice of dentistry only under the direct personal supervision of a registered dentist who is on the premises at which the hygienist is carrying out such work at the time at which it is being carried out'.²

The training takes place over a period of at least nine months in a dental hospital or dental branch of the armed services. The permitted work of the dental hygienist covers (a) the removal of calculus (scaling); (b) the cleaning and polishing of teeth; (c) individual and group instruction in oral hygiene and dental health

¹ D1.

² D2, p. 8.

education; (d) the topical application of fluorides or other prophylactic solutions.³

The total number of dental hygienists employed in the United Kingdom in June 1967, was 317,³ two of these were employed in the Northern Ireland school dental service. The British Dental Association considers dental hygienists as an accepted part of dentistry.⁴

Another ancillary employed in Northern Ireland is designated Dental Auxiliary. The Ancillary Dental Workers Regulations, 1968, permit a dental auxiliary 'to extract deciduous teeth under local infiltration anaesthesia, to undertake simple fillings, to clean, polish and scale teeth, to apply prophylactic solutions and to give advice on oral hygiene provided that the work is carried out in the course of providing national or local authority health services—in effect this means in hospitals, the priority and school dental services of local authorities and in health centres—and under the direction of a registered dentist after that dentist has examined the patient and indicated in writing to the auxiliary the specific treatment to be provided.'⁵ It is not necessary for the dentist to be within call when a dental auxiliary is extracting or filling a tooth.

Dental Auxiliaries receive a two year training course at the New Cross Hospital in London. The agreed salary scale for such auxiliaries, as from September 1966, was £695 rising by twelve instalments to £1,075. The total number of Dental Auxiliaries employed in 1966 in the United Kingdom was 224,⁶ the Northern Ireland school service employed seven in 1967.⁷

This class of ancillary has met with strong and persistent opposition from the British Dental Association. Both Labour and Conservative Governments in the United Kingdom ever since 1950 have attempted to introduce in the dental school service an ancillary similar to the New Zealand dental nurse (see below). Only in 1956 was the necessary enabling legislation passed. The first training course started in 1960. The BDA succeeded in hedging the permitted duties of these ancillaries with many restrictions, e.g. auxiliaries were only permitted to work in national or local authority health services, they were not permitted to extract permanent teeth, they were only permitted to fill and extract teeth after the patient had been examined by a dentist, and prior to the 1968 Ancillary Dental Workers Regulations becoming effective in 1969, the dentist had to

³ D2, p. 4.

³ D2, p. 4.

⁴ D2, p. 13.

⁵ D3, p. 233.

⁶ D2, p. 4.

⁷ D4.

be on the premises while the auxiliaries' work was in progress. As part of the agreement of accepting dental auxiliaries the BDA obtained an assurance from the UK Government that no prosthetic ancillaries would be allowed. At present the number of auxiliaries being trained is very limited; it is a mere 55 per year for the whole of the United Kingdom. The maximum number anticipated to be employed by 1978 is 1,000.⁸ The conditions under which dental auxiliaries are trained appear to be unduly generous in staff and equipment and possibly therefore unnecessarily expensive. (See BDJ, October 5th 1965, p. 290.)

General Dental Service

Persons who are ordinarily resident in Northern Ireland are entitled to dental treatment under the National Health Service. A patient may choose any dentist willing to accept him under the service and the dentist is free to accept or refuse any patient. The maximum charge to the patient for any conservative treatment is 30/- or the full cost if this is less and for treatment involving the supply of dentures the maximum is £5. Three groups of the population are exempt from charges:—

- (1) Children under 16 or attending full-time grammar or intermediate course at school;
- (2) Young people under 21 who have left school (these are liable to pay for dentures only);
- (3) Expectant mothers and mothers of children under one year.

These three groups account for 57 per cent of all courses of treatment provided.

Persons in receipt of Supplementary Benefit (Welfare Assistance subject to a means test) and other persons having very low incomes, have charges in respect of dental treatment refunded by the Supplementary Benefits Commission.⁹

Almost all dental treatment in the province is provided under the National Health Service, private practice outside Belfast is virtually non-existent and even in Belfast is very limited indeed.

The National Health Service expenditure on general dental services in 1967-68 was £2.5m, of this £0.3m was paid by patients.¹⁰ The average cost of dental treatment per head of the population under the general scheme came to £1. 13s. per year. In addition the cost of the dental hospital in Belfast was about £160,000 and the school dental service very approximately £300,000. Total expen-

⁸ D2, p. 12.

⁹ D1, p. 16.

¹⁰ D1, p. 15.

diture on dental service was therefore almost £2 per head of the population of which about 4/- was contributed by the patient. The aggregate estimated annual cost of approximately £3m is equivalent to 0.3 per cent of the estimated GNP.

The total number of applications for treatment was 584,000. On the assumption that nobody received more than one course of treatment during the year, and this at best is an approximation, the number of treatments in the general dental service per 100 population was about 39. The average cost of treatment per course was £4. 5s. of which the patient paid 11/-.

The demand for dental services in Northern Ireland has increased rapidly in recent years. While the population has increased between 1960 and 1968 by less than 8 per cent the number of dental claims paid increased from 366,000 to 584,000, i.e. by 59 per cent. The average contribution paid by the patient during this period has remained constant at about 11/- while the cost per claim to the Board has increased by 13/8, i.e. by 23 per cent.¹¹ During the same period the number of principals and assistants providing general dental services has increased from 323 to 396. The average gross income per dentist under the National Health Service was therefore £4,100 in 1960 and £6,300 in 1968.¹⁰

The productivity of dentists shows a marked increase. In 1960 the average number of claims per dentist was 1,124, by 1968 this had increased to 1,468. This rise may partly be explained by changes in dental techniques and partly by a greater public demand for services.¹¹

School Dental Service

In addition to the general and the hospital dental services there is a school dental service for all school children. Irrespective of age about half of all children had their teeth inspected in 1967 and almost two-thirds of these were found to be in need of treatment. The children are given the option of receiving treatment by the school dentist or by a general dental practitioner. Only 53,000, about half those whose teeth were found to be defective, were treated by the school dentist. This proportion varies in different parts of the province and was as low as 25 per cent in Belfast. It is generally thought that in the large urban centres the school dental service caters mainly for children whose parents have relatively low incomes. Treatment provided under this service included 74,000 fillings and 6,000 extractions—a ratio of extraction to

¹¹ D1, p. 48, 49.

¹⁰ D1, p. 15.

fillings of 1 to 11.5. They also filled 35,000 temporary teeth and extracted 29,000, a ratio of 1 to 1.2.¹²

The volume of treatment undertaken by general dental practitioners in respect of children aged between 5 and 15, for deciduous teeth, is about twice as great, and for permanent teeth four times as great as treatment provided under the school dental service. Under the general dental practitioner service the ratio of extractions to fillings of permanent teeth is 1 to 6 and of temporary teeth is 1 to 0.7.¹³ (These figures are based on a 10 per cent sample of claims submitted in the three months ending March 1968. They are thus subject to a sampling error and based on the assumption that the March quarter represents 25 per cent of the year's claims.)

It is worth commenting on the fact that in a society where all dental services are completely free for all children under 16 the number and proportion of defective teeth discovered in school examination is still very large. The National Health Service providing very heavily subsidised dental services (i.e. the patient pays on average about 13 per cent of the cost) has existed since 1948 but the demand for treatment is consistently and rapidly increasing every year.

(See also Appendix II)

DENMARK

Manpower

The total number of practising dentists is approximately 3,250 giving a population dentist ratio of about 1,500. The average age of dentists is 43 years, 61 per cent are below the age of 45. The proportion of women dentists is 39 per cent. There are only two dental colleges in the country, these produce approximately 200 graduates annually. This relatively high number in relation to the number of practising dentists may well be due to the large proportion of women in the profession. 2,300 dentists are engaged in private practice, 620 are working full-time in the school dental service and about one eighth of all dentists are married to a dentist.¹⁴

As in other countries the distribution of dentists between different parts of the country is rather uneven. Approximately half of all dentists live in Copenhagen and its suburbs which contain only one quarter of the population. Thus large areas of the country have only one dentist for 5,000 persons while there is one dentist per 1,000

¹² D4.

¹³ D5.

¹⁴ D6.

in Copenhagen.¹⁵ This maldistribution in part is of course due to the concentration in Copenhagen of dentists in various forms of public service.

Denmark is the only European country except Switzerland which permits dental technicians to make dentures and to fit them. There are at present more than 600 technicians who undertake such work as private practitioners. They work under an act which is more than 100 years old, have not necessarily received any formal training and are not officially recognised. Neither the number nor the age distribution of these technicians is known nor has any attempt been made to assess the quality of their work. There are a further 600 qualified laboratory technicians, who receive a training lasting more than four years, who could practise privately but in fact do not do so and instead work full-time in dental laboratories. Technicians are not permitted to extract teeth but very occasionally have been known to do so. Dentists in Denmark, as in other countries, are opposed to technicians fitting dentures and allege that this results in many bad fittings and consequent mouth cancer.¹⁶

School Dental Service

The origin of the school dental service goes as far back as pre-1914. The nature of the service altered several times. Under the so-called private plan there were provisions for local authorities to refund a proportion of the dental bill for families sending their children to a private dentist. This system was recognised to have the disadvantage that only children of conscientious parents received treatment. Those who needed treatment most received no care at all. At present, there are three basic types of municipal school clinics depending on the size of the community. One dentist is thought to be able to look after 500-700 children. Any authority having that number of children will employ a full-time dentist. If the number of children exceeds about 700, one or more additional part-time dentists will be employed. If there are less than 500 children in an area a dentist will be employed on a part-time basis and will be permitted to rent the school clinic for private practice. The dentist is therefore able to treat economically the adult patients in the community.¹⁷

A third system operates when a number of small communities jointly establish a school dental clinic. This may provide work for three to five dentists looking after 2,000-3,000 children. The disadvantages of this system are that the children have to be trans-

¹⁵ C2.

¹⁶ D7.

¹⁷ C2.

ported from the schools to the clinic, lose class time and often have to wait for long periods.

Of a total population of 700,000 school children, 300,000 have the opportunity of systematic examination and treatment by public school dental officers, regardless of family income. Between 95 per cent and 100 per cent of eligible children avail themselves of this service.¹⁷ However, in 1966 the majority of children were still not covered by the public dental scheme. Most of the children not covered by the public service came under the private plan.

The Danish school dental service claims to be unique in its working conditions and organisation. It is considered a great advantage that dentists have special knowledge and skill in the practice of children's dentistry on which they concentrate full-time. Throughout the country they work only during regular school hours and have the same holidays as school children. This is a particular advantage as the majority of school dentists are women, many of them married with children of their own. In 1966 all women graduating from the Royal Dental College in Jutland started work as school dentists. The school dental service is comprehensive and covers preventive and curative treatment as well as giving special emphasis to dental health education.¹⁷

Public authorities in Denmark are on the whole opposed to fluoridation of water supplies but recently programmes of mouth rinsing with fluoride solutions were introduced in certain schools.¹⁷ This programme is considered a marked success. In 1966 it was expected that the school dental service would soon become mandatory on all local authorities but would remain voluntary for the children. This however has not yet happened.

The cost of the school dental service in 1968 was approximately 200-250 Danish Kroner, say £10-£12. 10s. per child. (The cost in Ireland of the school dental service is 14/- per child per year). They are just starting to use chairside assistants but there is no formal training for them as yet.¹⁷

Dental Services for Adults

Virtually the whole population in Denmark are members of health insurance funds. There are two types of funds—known as 'A' division and 'B' division. Income is the deciding factor of which division a person is a member. Heads of families having incomes of less than 42,000 Danish Kroner (£2,300) or single persons with incomes below 31,700 Danish Kroner (£1,700) are in division 'A'—those having higher incomes are in division 'B'. The health insurance funds have made agreements with the dentists that 'A'

¹⁷ c2.

members receive conservative dental care, e.g. fillings, and members born in 1945 or later preventive dental examinations as well. The fees for the various treatments are fixed in the agreement. The fund pays two-thirds of the amount direct to the dentist, and three-quarters for members who are covered by the arrangement of regular dental examination. The rest is paid by the member to the dentist, together with any special treatment not included in the agreement. 'B' members must pay their bills directly to the dentist but are reimbursed by the fund for the same amount granted to 'A' members.¹⁸

The arrangement for regular dental examination was introduced in 1965. At present it covers only persons between 16-23, but the age limit will be increased by one year every year, i.e. it will be 25 in 1970. Everyone is permitted to join on having completed school. Anybody who wishes to join two years after leaving school must have himself made dentally fit before being permitted to do so. If a person under this scheme does not attend as requested he loses entitlement automatically. He too must have himself made dentally fit before being permitted to rejoin.¹⁹

Dental fees are fixed by agreement with the health insurance funds. The fees are adjusted twice a year to allow for changes in the value of money; between 1965-68 they increased by 23 per cent. The fees appear to be rather high. Some examples from the official agreement will illustrate this:—a filling on one side of the tooth only—34/6; a filling covering two sides—44/-; a filling covering three or more sides—58/-; coronal amputation, including paste, put in but excluding filling—48/-. All these fees increase proportionally if more than one tooth is treated.²⁰

The payment of dental fees by the approved sickness funds in 1965 came to £3.6m almost exactly equal to a £ per head of the population over 15. If the one-third of dental fees paid by the patient is added to this the cost comes to 30/- per head.²¹ Since that date dental fees have increased by 23.4 per cent²⁰ giving an estimated expenditure on dental fees in 1968 of 37/- per person over 15.

The health insurance funds give financial assistance to all members in respect of conservative treatment and to some members for preventive dental examination. Members however have to pay the full cost of dentures irrespective of by whom they are fitted. In the fitting and supply of dentures qualified dentists compete with technicians without the patients of either being entitled to claim for financial assistance to the insurance. Only persons who are supported by public assistance receive all dental care free of charge. They have their dentures fitted by qualified dentists.

¹⁸ D8.

¹⁹ D7.

²⁰ D9.

²¹ D10.

NEW ZEALAND

Manpower

New Zealand has a population of 2.6 million and thus is even smaller than the Irish Republic. It is, however, a much richer country and has long established high standard social services. The population doctor ratio at 670 is one of the lowest in the world. There were in 1965, 924 dentists giving a comparatively high overall population dentist ratio of 2,800 to one, equal to a ratio of 3,300 per practising dentist. Excluding children treated by dental nurses the ratio was 2,600.²² The remarkable feature concerning dental services is, however, the much more widespread employment of auxiliaries than in any other country. There were in 1968, 1,182 school dental nurses.²³ Detailed accounts of the New Zealand school dental service have been published. There is no need to give more than a brief outline.

Prior to 1921 no person other than a registered dentist was permitted to practise dentistry. In that year the law was amended and the Minister of Health was authorised to permit 'the performance in any public dental service of dental work by any person in accordance with conditions approved by the Minister'.²⁴ The school nurses are full-time officers of the Department of Health which select, train and employ them. They have no degree or licence enabling them to practise dentistry. They are awarded by the Department of Health, after the completion of a two year training course, a certificate of proficiency in Theory and Technique in Preventive and Operative Dental Care of Children. The Department has laid down 'that the dental nurse is not to be regarded as a lower grade of dentist, but as an auxiliary worker enjoying professional standing in her own right in the status indicated by her designation'.²⁵ All dental nurses must be female, hold a school certificate, have a good general physique, normal eye sight, a healthy mouth and throat and sound natural teeth.

The work the nurses are trained and permitted to perform includes fillings in both deciduous and permanent teeth using local anaesthetics and prophylaxis. No root treatment is undertaken but pulp capping is done as well as simple gum treatments. Dental health education is part of the regular duties of the dental nurse.

²² D11, p. 35.

²³ D12.

²⁴ D13, p. 87.

²⁵ D13, p. 88.

School Dental Service

Dental nurses are school centred and work in one or two surgery clinics which are placed in the school grounds. Each nurse is responsible for the dental health of about 500 children throughout their primary school life up to the age of 14 years. Thus an urban school of 1,000 children will have a two surgery clinic and a village school with as few as 100 children will have its one chair surgery with a part-time dental nurse. Smaller schools will be visited by a mobile clinic and the nurse will stay in the village for two or three weeks twice a year.²⁶ Treatment for children which is beyond the scope of the school dental nurse is provided by private dental practitioners on a fee for service basis.²⁷

Almost three-fifths of all pre-school children from two and a half years onwards are seen at the request of the parents by the nurse. In 1966 some 98 per cent of all children attending primary and intermediate schools received regular dental care, 88 per cent by the school nurse and 10 per cent were enrolled with dentists under the General Dental Benefit Scheme.

The school dental service has expanded considerably in the post-war period, only 65 per cent of all children at school were covered in 1952.²⁸ The state of dental health of children receiving the service, using the simple criteria of extractions per 100 fillings, has greatly improved. This ratio was 72 in 1925 at the start of the service, had fallen to 30 by 1930, to eight by 1950 and at present is three.²⁹

The service has been disparaged as concentrating on treatment rather than prevention. This is countered by the National Health and Medical Research Council of Australia in their publication 'Dental Auxiliary Personnel' published in October 1965.

'Some criticism has been levelled at the New Zealand Dental Service on the grounds that the treatment given is aimed at conservation rather than the early prevention of dental diseases. This is without substance as in actual fact these auxiliaries do spend a considerable proportion of their time in dental health education and the like. Further, early conservative treatment is preventive and when fluoridation is introduced, the full effects of this preventive measure will be seen.'

In addition there is a dental service for adolescent children up to the age of 16. To a small and diminishing extent this is provided by government employed dentists in departmental clinics, but in the

²⁶ D14.

²⁷ D11.

²⁸ D15, p. 118.

²⁹ D15, p. 120.

main by private dental practitioners who contract with the Department to treat children on a fee for service basis. The children they take over from the school dental service are trained in taking care of their teeth and have clean and well cared-for mouths.

In 1967 about 518,000 pre-school and primary school children were treated in the school dental service staffed by school dental nurses and 48,000 children in primary and intermediate schools were enrolled with dentists under General Dental Benefits. The total cost of the school dental service came to NZ \$4.1m. (£1.9m.), i.e. £3. 7s. per child.³⁰

Private dentists treated 165,000 children under 16—48,000 in primary and intermediate schools, 30,000 in secondary schools and 87,000 children between 14 and 16. The cost of this treatment was NZ \$2.7m. (£1.3m.), i.e. nearly £8 per child.

Dental State of Adolescents

In 1968 the Department of Health published the findings of a survey conducted between 1962 and 1964 into the dental fitness of adolescents aged 15 to 21.³¹ The aim was to explore the consequence of cessation of general dental benefits on the 16th birthday. The random sample covered 2,145 persons. Each examination took approximately 15 minutes and included six radiographs for each subject. The Report concludes:—

'Both sexes showed a quite high level of dental fitness as measured by the relative magnitudes of the components of the DMF teeth index, the levels being higher in the female than the male.'³²

The mean number of months since the last dental visit for 18 year old males was found to be 11.3, and for females 8.0.³³ Amongst the males 62 per cent and amongst the females 69 per cent of the 18 year olds had received regular treatment at every age of their life.

For that age group 35 per cent of the boys and 27 per cent of the girls had not received regular treatment by a dentist after the age of 16.³⁴ Brushing of teeth appears to be a common practice in New Zealand. Only 18 per cent of the boys and three per cent of the girls admitted to not brushing their teeth at least once a day.³⁵

The incidence of dental caries in New Zealand is undoubtedly

³⁰ D12.

³¹ D16.

³² D16, p. 85.

³³ D16, p. 80.

³⁴ D16, p. 77.

³⁵ D16, p. 59.

very high. The mean number of DMF teeth amongst 18 year olds is 19·8 for males and 18·8 for females.³⁶ The number of teeth which were extracted and which ought to have been extracted for males averaged 1·8 and for females 1·6 (Irish Army Cadet Candidates 4·5, Recruits 7·6, Apprentices 6·7) while the number of teeth which had been filled was as high as 14·4 for males and 14·7 for females. (Cadet Candidates 4·0, Recruits 1·8, Apprentices 1·6). The figures of 19 and 20 year olds are not significantly different.³⁷ It seems doubtful whether such a record of dental treatment can be equalled by any other country.

UNITED STATES

The USA is not only the richest country in the world but also the country providing better documentation and statistics for all kinds of activities than any other state. In this section four aspects of dental care—dental manpower, the state of dental health, dental services and expenditure on dental fees—will be considered. All the figures quoted are derived from official publications of the US Department of Health, Education and Welfare in the National Center for Health Statistics Series.

Manpower

The total number of dentists in 1967 was approximately 112,000, of which some 13,000 had retired or were engaged in non-dental activities. About 8,000 were working as dentists in the Armed Services thus leaving 91,000 providing dental services to the civilian population.

The population dentist ratio was higher in 1967 than it had been in the early post-war period. In 1950 there were 2,000 persons per dentist (excluding those in the Armed Forces) and by 1967 this figure had increased to 2,180. The distribution of dentists between the States is quite uneven. At its lowest, the population dentist ratio was 1,470 in New York and at its highest it was 4,350 in South Carolina; in twelve states mainly in the south it was in excess of 3,500; the Armed Forces had one dentist for every 430 personnel. The median age of practitioners not in the Armed Forces was 48 years. This is evidence of a settled profession which has not expanded rapidly in the recent past. About 10 per cent of the dental profession are recognised as specialists.

³⁶ D16, p. 44.

³⁷ D16, p. 44.

There are 50 schools offering a dental qualification, nine of these have been established since 1950. Some 3,360 students graduated from these schools in 1967, an average of only 67 per school.

It is estimated that 15,000 dental hygienists were in practice in 1967—about 16 per 100 practising dentists. Their number has almost doubled since 1950. In the last few years the training facilities for dental hygienists have greatly expanded; in 1967 some 4,300 students started their training.

The number of dental chairside assistants in 1967 was 95,000—rather more than one for each practising dentist. Traditionally, these assistants have been trained on the job by their employers but recently there has been a shift to more formal education.³⁸

State of Dental Health

The general state of dental health is astonishingly poor though the well-known concern of Americans with hygiene and with high standards of dental care would lead one to expect the opposite. Conservative estimates based on the examinations of 6,672 persons (a random sample of the civilian non-institutional population aged 18-79 in 1960-62³⁹) show that at least one in every four adults had no natural teeth remaining in either one or both jaws. For every 100 persons some 18 had no natural teeth at all,⁴⁰ 9 had natural teeth in only one jaw, and a further three had teeth which ought to have been extracted and which would have left them edentulous. Only just over one per cent of persons aged 18-24 were without teeth, but in each succeeding age group the proportion increased. In the 35-44 age group about six per cent of the men and 10 per cent of the women were edentulous, while in the 75-79 group some 56 per cent of the men and 65 per cent of the women were toothless.⁴⁰ About 80 per cent of all edentulous persons had satisfactory dentures.⁴¹

Amongst non-edentulous persons of all ages the average number of decayed, missing or filled teeth was 18. This average increased with age being about 14 for the age group 18-24 and 25 for those aged 75-79.⁴² Young men aged 20-24 had on average 2·2 teeth decayed, 5·0 missing and 6·5 filled. For young women the averages were—2·0 decayed, 5·3 missing and 7·1 filled.⁴³

³⁸ D17, p. 27 and 28.

³⁹ D18, p. 2.

⁴⁰ D19, Table 1.

⁴¹ D19, Table 2.

⁴² D20, Table 5.

⁴³ D21, Table 5.

The proportion of all adult men suffering from some degree of periodontal disease was almost 80 per cent, that for women, at 70 per cent, was somewhat lower. Destructive periodontal disease was endured by one quarter of all adults and was strongly associated with age. The incidence was 10 per cent for the youngest age group and as high as 50 per cent for the oldest age group. These estimates of prevalence and severity are conservative. In addition many of the edentulous persons are likely to have had at some time the severe destructive disease.⁴⁴

The dental state of persons is closely related to their income. The incidence of periodontal disease⁴⁵ as well as complete loss of all teeth⁴⁶ shows a strong inverse relation to income. Men and women with greater means or higher schooling had more DMF teeth than poorer persons or persons with less education. A larger number of filled teeth was not quite offset by fewer decayed or missing teeth.⁴⁷

Dental Services

The number of visits to the dentist was estimated on the basis of household interviews of the civilian non-institutional population. These covered a random sample of 42,000 households containing 134,000 persons.⁴⁸ The estimates based on this survey show an average of 1.6 dental visits per person in the year ending June 1964. The frequency of dental visits varied with both age and sex. It was least for the under fives and the over sixty-fives and rather higher for females (1.7) than for males (1.4).⁴⁹

There was a strong direct relationship between family income and the number of visits per person. For example, those with family incomes of less than \$2,000 per year made 0.8 visits compared with 2.8 visits in families where the income exceeded \$10,000.⁵⁰ Similarly there was a strong direct relationship between the number of dental visits and the level of education obtained.⁵¹ The higher income groups obtained more services of all kinds, except for extractions, especially 'cleaning' and 'examinations', than persons with lower incomes.⁵² Only 42 per cent of the population made at least one visit to the dentist during the year. The annual rate of

⁴⁴ D22, Table 1.

⁴⁵ D22, Table 6.

⁴⁶ D19, Table 3.

⁴⁷ D20, Table 17.

⁴⁸ D23, Page 2.

⁴⁹ D23, Table 4.

⁵⁰ D23, Table 3.

⁵¹ D23, Table 6.

⁵² D23, Table G.

visits amongst persons who made at least one visit was approximately 3.8.⁵³

Dental visits by women exceeded those by men by about 21 per cent.⁵⁴ This divergence between the sexes was greatest for the age group 15-24, when 58 per cent of the girls and 52 per cent of the men had visited the dentist within the previous 12 months. However, even at this age more than a quarter of all young persons had not been to the dentist for at least two years.⁵⁵ Professor J. M. Dunning in 'Principles of Dental Public Health' 1962, refers to the fact that the present efforts of the dental profession in America accomplish hardly more than one third or one quarter of the needed dental treatment.⁵⁶

Expenditure on Dental Fees

Estimates of expenditure on dental fees are based on mail-in questionnaires left with the household health interview respondents during the last six months of 1962. These covered 22,000 households containing 71,000 persons.⁵⁷

About 15 per cent of the aggregate health expenses were for dental care.⁵⁸ The variation in dental care expenditure for various sections of the population was considerably greater than that for any other type of health expenditure. The proportion was lowest for persons under 5 and over 65 years of age, persons with less than nine years education, those with low incomes and those with chronic diseases. For families having income of less than \$3,000 only 8 per cent of aggregate health expenditure went on dental care, while for families having an income in excess of \$10,000 the proportion was 21 per cent.⁵⁹ (See Table 10.) Average dental expenses per person were \$19 but they were as little as \$9 for those whose family income was below \$2,000 and as much as \$37 for those of family incomes of more than \$10,000 per year.⁶⁰ The average dental expenditure in 1962 for children aged 6-16 was \$18 (£6-£7 at the then rate of exchange).⁶¹

As income rises the proportion of total family income spent on health services declines.⁶² The pattern of expenditure on dental fees

⁵³ D23, Page 4.

⁵⁴ D23, Table 2.

⁵⁵ D24, Table 2.

⁵⁶ D28, Page 504.

⁵⁷ D25, Page 2.

⁵⁸ D25, Table C.

⁵⁹ D25, Table J.

⁶⁰ D27, Table 4.

⁶¹ D27, Table 1.

⁶² D25, Page 13.

Table 10

Private expenditure on all health and dental services for the USA, 1962

Dollars	Proportion of Income spent on:—	
	All Health Services	Dental Service
	%	%
Over 10,000	< 6	> 1.1
7,000—9,999	6	1.1
5,000—6,999	8	1.1
3,000—4,999	10	1.1
Under 3,000	> 10	< 1.0

SOURCE:

Calculated from Table J Series 10 number 41, National Center for Health Statistics.

is completely different—as income rises the proportion spent increases.

On the assumption that the average expenditure on dental fees is \$19 per person, that there were 182 million persons in the civilian non-institutional population and that there were 91,000 dentists, excluding those serving in the Armed Forces, the average gross income per dentist was \$38,000 (£13,000). This average excludes expenditure by the Uniformed Services Dependents Medical Care Program, by the Veterans Administration, by charitable and welfare organisations and by Federal State, City, or County authorities.

A study of the American dental situation shows up clearly that even in a wealthy society without provision of public dental services the state of dental health of the people remains astonishingly low. The income of dentists is high even by American standards, but large sections of the population do not visit the dentist for many years. Finally, it is interesting to note that the population dentist ratio in some European countries—West Germany, Norway, Sweden and Denmark—is lower than it is in the United States.

Some of the findings from the studies of different countries are summarised in Table 11. To compare these, as has been pointed out earlier, may be misleading but it was thought that the table may be of interest in spite of its many limitations.

Table 11
Selected findings from studies of different countries, 1967

	Ireland			Northern Ireland	Denmark	New Zealand		U S A	
	Cadet Candidates	Army Apprentices				Males (18 years)		Males (20-24 years)	
Average Teeth Extracted	4.5	6.7				1.8		5.0	
Average Teeth Filled	4.0	1.6				14.4		6.5	
Average Teeth Decayed ¹	4.7	6.7				3.6		2.2	
Person per Dentist			4,200 ²	3,000	1,500		2,800		2,200
Average Annual Cost of Dental Care per child ³ £			.7 ⁴	1.6 ⁵	11.0 ⁶		3.4 ⁷		6.5 ⁸

SOURCES:

Details are given in text.

Notes:

- (1) Not strictly comparable, Irish examination by probe and mirror, New Zealand and U S A by X-ray.
- (2) Per registered dentist.
- (3) Converted to £ at October 1967, official rate of exchange.
- (4) Public Dental Services per child at National School.
- (5) Aggregate estimated cost of General and School Dental Services for all children aged 5 to 15.
- (6) Refers to just over two-fifths of children of school age covered by School Dental Services., i.e. those residing in larger urban areas.
- (7) Refers to pre-school and Primary school children treated by School Dental Nurses., i.e. about 90% of all children receiving dental treatment.
- (8) Private dental expenditure for children aged 6 to 16, national random sample.

VI. PREVENTIVE AND CURATIVE DENTAL SERVICES— SOME ISSUES

The purpose of the Dentists Act, 1928 was to improve the general standard of dentistry. There can be no doubt and it requires no detailed discussion that in this objective the Act has been outstandingly successful. The extraction of teeth without a proper anaesthetic as well as jaws and teeth broken in extraction are now things of the past.

At the present time it is not so much the quality of dental care which is unsatisfactory but the general state of dental services. The limited evidence available indicates that the state of dental health is bad. Any improvement will have to be the result of a combination of three factors: (1) more effective application of proven preventive measures; (2) an extension of conservative treatment and (3) an increase in the supply of dentures. One day there may be other possibilities—some new prophylactic devices against both caries and periodontal disease. There are references in the literature to this.¹ At present, however, such advances seem so far ahead that it would not be reasonable to plan on these hopes being realised. Some forms of prevention are themselves the function of dental services and therefore it seems logical to discuss first any possible changes in the structure of the dental services which may be desirable.

The Public Service

Four factors relating to public dental services in Ireland need to be highlighted. First, the salaries of public dental officers at present are very similar to those in Northern Ireland and Britain. In recent years when salary levels were lower, recruitment of dentists to the public service became virtually impossible. In a society where average income per head is only 50 per cent or 60 per cent of that of Britain,

¹ E1, Page 60.

the payment of approximately the same salaries presents a heavy burden on public revenue. The fact that dentists are not unique in this position and that similar conditions exist in other professions, for example school and university teachers, is not a justification or even an explanation. If it is necessary, and there can be little doubt about the necessity, to pay dentists salaries of such a magnitude, it is all the more desirable to utilize their services in the most efficient way. Second, even at these salaries it has not proved possible to recruit the number of dentists required into public service. While it is comparatively easy to attract staff to Dublin and some of the other large towns there is a considerable reluctance on the part of dentists to accept appointments in the rural areas, particularly in the west of the country. Third, as the number of dentists employed is quite inadequate to provide satisfactory treatment, public dentists are frequently employed in rendering an emergency service. For a man who had five years of university training this may be demoralizing. The fact that dentists in rural areas often have to travel long distances to visit schools and outlying clinics does not make the work more attractive. Fourth, the Dentists Act of 1928, which restricts all performances in the oral cavity to registered dentists, may well have contributed to the inadequate state of dental services provided. The employment of various grades of ancillary staff would enable the scope and the quality of the service to be increased.

Auxiliaries

The World Health Organisation Expert Committee on Auxiliary Dental Personnel in a report published in 1959² enumerates four distinct grades of such ancillary staff—chairside assistants, dental laboratory technicians, dental hygienists and school dental nurses. Chairside assistants are already employed to a considerable extent in the public services. They are usually trained by the dentist whom they assist and receive no formal training. The majority of local health authorities recruit secondary school leavers specifically for this task, while a few employ public health nurses. It must be considered as extremely doubtful whether a woman with the training and experience of a public health nurse ought to be employed as a chairside assistant. This may well be more expensive and a misuse of skilled manpower.

The Expert Committee suggests that it is desirable to have a formal course of training of one year's duration. They suggest that the dental chairside assistant who had the benefit of a formal course

² E2.

of training can adapt herself to the varying needs and skills of individual dental surgeons in differing environments, whereas the assistant who has received her training from one person only, in the form of apprenticeship, is less likely to be able to do this.

A few years ago the Dublin Dental Hospital introduced a training course for Dental Surgery Assistants which has a duration of two years and includes some secretarial training. Their salary after they have completed their training increases by five increments from £580 to £755. This is appreciably higher than the salary paid by local health authorities, where in some the maximum was £450 per annum for assistants who had received no formal training. However, in Dublin the Health Authority salary scale rises from £510 to £637 per annum.

The second type of ancillaries enumerated in the WHO Report are dental technicians. A survey of these ancillaries was undertaken in the Republic by the Voluntary National Apprenticeship Committee for Dental Technicians, in 1964. At that time a total of 179 were employed—98 in commercial laboratories, 64 by private dentists, 13 in the Dental Hospital and four in the Army. The technicians now serve a five year apprenticeship and attend part-time lectures at Kevin Street College of Technology in Dublin and at the Crawford Technical School in Cork. The courses they attend are based on the City and Guilds syllabus. The present minimum salary for dental technicians is £16. 10s. for a 41½ hour week plus an allowance of £50 per year in respect of having passed the finals of the City and Guilds Institute examination for dental technicians.³ These are minimum scales and are the rates normally paid by commercial laboratories. Private dentists frequently pay above this scale, say up to £20 per week.

The Expert Committee emphasises that dental technicians should not take impressions of the mouth and that they should not have contact with patients. (This statement is not supported by any argument or evidence.) As mentioned above, certain classes of dental technicians in Denmark are permitted to take impressions for dentures. In the early 1960's dental technicians in the Canton of Zurich obtained the right to limited practice on patients and there are approximately 50 of them exercising this right.⁴

In the State of Alberta in Canada the Dental Technicians Act 1961 permits dental technicians to have direct dealings with the public rather than exclusively through a dentist.⁵

³ E3.

⁴ D11, Page 38.

⁵ D13.

The third type of dental ancillary discussed is dental hygienists. Such a grade at present does not exist in Ireland and indeed would not be permissible under the Dentists Act 1928. The Expert Committee were satisfied that dental hygienists are most valuable in the field of preventive dentistry and by virtue of the practice of simple dentistry can extend the benefits of oral health to large sections of the community. The Committee did not consider that the recruitment of dental hygienists needed to be limited solely to females. The functions of dental hygienists would include—(1) the cleaning of teeth; (2) the removal of calculus; (3) dental health instruction; (4) the cleaning of the mouth before treatment is instituted; (5) the topical application of fluoride or other prophylactic solutions; (6) the screening or primary examination of groups, such as school children, for dental defects in order that they may be referred to qualified dentists for treatment.

The dental hygienist has a dual role, working either as an ancillary to the dentist in private practice or as a member of the public health team. It was thought that a minimum period of training of one year would be appropriate. Hygienists introduced by the 1956 Dentists Act in the United Kingdom, which applies to Northern Ireland, may perform only the first four functions recommended by the WHO Expert Committee. They are not permitted to chart teeth or screen groups such as school children (in order that they may then be referred to qualified dentists for treatment). At the Annual General Meeting of the Irish Dental Association, April, 1969, limited approval appears to have been given for the introduction of the grade of dental hygienist (neither the proceedings of the Association nor the resolutions passed are published). Lt. Col. Whelan, the Honorary Secretary, writes:

'the organisation of community dental services is not yet at the stage where full use can be made of dental hygienists . . . Indeed, it is more than likely that if they were introduced they could be more beneficially employed by private practitioners at present. Also it must be remembered that many dental practitioners in this country are not fully employed, and while this situation exists, the introduction of hygienists is obviously still a subject for discussion by the profession.'

(Irish Times, 9 May 1969.)

The fourth grade of ancillary referred to is school dental nurses. These have been employed in New Zealand for some 40 years and recently have been introduced in some European countries. These ancillaries are trained specifically to deal with pre-school and school

children and function as members of the dental health team. Through their employment, according to the WHO Expert Committee, large numbers of children can be maintained in a state of sound dental health, with a minimum number of dental surgeons directing, controlling and complementing their work. It was suggested that the minimum training period should be two years. The functions of these nurses would include (1) examining patients and charting the dental condition; (2) performing prophylaxis; (3) placing fillings in both permanent and deciduous teeth; (4) extracting teeth under local anaesthesia; (5) making topical application of preventive medicaments; (6) recognising malocclusion and lesions whose treatment is beyond their scope and referring them to a dentist; (7) teaching the principles of dental health to children and groups of adults.

The functions recommended by the WHO Committee are the same as those actually performed by school dental nurses in New Zealand. The dental auxiliaries in Northern Ireland have much more restricted functions. They may only extract or fill teeth 'under the direction of a registered dentist and after the dentist has examined the patient and has indicated in writing to the auxiliary the specific treatment to be provided.'⁶ The dentist has also to ensure that the treatment prescribed is satisfactorily carried out. Furthermore, she may not chart the dental condition. These restrictions reduce significantly the usefulness of this ancillary grade and appear to be quite opposed to the spirit of the WHO Report. The agreed salary for dental auxiliaries in Northern Ireland in September 1966 was £695 by twelve increments to £1,075.⁷ At that time the rate for public dental officers was £1,500 by eight increments to £2,260.⁸

Doctor Letherman, Secretary-General, Federation Dentaire Internationale, addressing the Irish Dental Association's Annual General Meeting in 1967 strongly supported the use of this type of ancillary:

'It is my belief that the future will show an increasing need to introduce the New Zealand type of dental nurse into the team, and that an intelligent delegation of work of a repetitive value (*nature*) to well trained auxiliaries will become part of the pattern of the future.'⁹

At present about 114 dentists are employed in the public dental service in Ireland. To provide a service on New Zealand or Danish standards would require about 1,000 dentists; even allowing for the beneficial effects of fluoridation, which should become manifest in

⁶ D3, page 233.

⁷ D2, page 11.

⁸ E4, page 351.

⁹ E1, page 62.

the next few years, about half that number would be required. This estimate would provide a service for national school children only and would not cover children of corresponding ages in private or secondary schools nor any children above the age of 14. Even if it was possible to recruit 500 dentists (at an approximate cost of £1.5m.) for the public service this would represent a disproportionate and heavy burden on local health authority budgets.

'The dentist, however, can make an important contribution to dental manpower resources by utilising to the utmost the dental auxiliaries which are authorised in his country. There is overwhelming evidence that the proper utilisation of properly trained dental auxiliaries (1) increases the productivity and economic reward of the dentist; (2) deepens the pools of dental manpower without the costly, and, perhaps, needless, multiplication of dentists to cope with the national needs.'

(Dr. H. Hillenbrand, Secretary of the American Dental Association, addressing the Annual Meeting of the Irish Dental Association, April 1966.)¹⁰

This same view is expressed by Dr. Letherman:—

'Dentistry must solve its manpower problems by accepting, training and using more and more auxiliary personnel as well as training more dentists.'¹¹

(Address to UCD Dental Students Society, March 1965.)

There is universal agreement about the importance of prevention. Four of the five known methods of prevention are well within the field of competence of dental auxiliaries. There is no reason to think that dental health education relating to diet and care of teeth can be given more effectively by dentists than specifically trained ancillary staff. Three other preventive measures—periodic examination, the scaling and polishing of teeth and the topical application of fluoride solutions in localities not supplied with fluoridated water—can also be performed by auxiliaries with a high degree of proficiency. It may be that in very rare circumstances in a periodic examination a dentist would discover a defect which an auxiliary would overlook. However, this is compensated by the large number of defects which would be discovered by the more regular inspection which auxiliaries could undertake. The hope of providing a high standard of preventive dentistry without dental hygienists, in the public service, in Irish conditions, appears to be quite illusory.

The introduction of a grade of ancillary similar to the Northern Ireland dental auxiliary or the New Zealand school dental nurse is

¹⁰ E5, page 11.

¹¹ E6, page 19.

much more controversial. Dentists in most countries have now readily accepted the dental hygienist but there is still widespread opposition to auxiliaries filling and extracting teeth. Dentists consider this as a dilution of their profession, which they fear might lead to a deterioration of their status in the community and a lowering, or at least potential lowering, of their income. The danger of reducing the dentists' status by the introduction of a more senior grade of ancillary appears ill-founded. The introduction of ancillary staff of various grades would make the professionally qualified dental surgeon the leader of a team which would consist of clerks, chair-side assistants, mechanics, hygienists and auxiliaries, a position not unlike that of a doctor in a hospital or a general practitioner in the Northern Ireland Health Centres.

The price of any commodity or service in the long run is determined mainly by the operation of forces affecting supply and demand. A high level of demand and a low level of supply will make prices rise and a low level of demand and high level of supply will make them fall. This is as true of remuneration of dentists as of any other price. The work performed by ancillaries will increase the total supply of dental services and in that sense may reduce the earnings of dentists. This reasoning is however based on the *ceteris paribus* assumption. In a dynamic society where standards of living are increasing the demand for dental services will rise. American evidence seems to indicate that dental services have a high income elasticity of demand, which means that when incomes rise private expenditure on dental care increases more than proportionately. The same is true of public dental services for which no charges are made. In recent years the number of claims for free treatment under the social welfare scheme have increased steeply. The experience of Northern Ireland also supports the supposition that increasing standards of living lead to more than proportionate increases in demand for dental care, even if dental services are virtually free.

There is also the political and ideological problem of the morality of the State giving a monopoly of the right to perform services to a single group of people. This is justified only if such a monopoly is clearly and undoubtedly in the public interest. No reasonable and fair-minded person looking at what is happening abroad and pursuing the professional literature can possibly claim that the employment of ancillaries involves a health hazard which requires the restrictions of the 'practice of dentistry' to registered dentists.

The interests of different groups of the population such as shareholders and employees, producers and consumers, teachers and pupils, solicitors and house purchasers, doctors and patients, are often potentially in conflict. The nature, structure and condition of

dental services similarly are a potential source of conflict between the dental profession and those who pay for the service—the State and the patient. To Lt. Col. Whelan (see page 48) and to Dr. Owens (see page 53) the fact that not all dentists in private practice are fully occupied is a valid argument for delaying the introduction of various types of ancillary staff—Lt. Col. Whelan, the dental hygienist and Dr. Owens, the dental nurse—but the views of the State representing the community might be rather different.

This view was persuasively expressed by Viron L. Diefenbach, Assistant Surgeon General, Chief Division of Dental Health, US Public Health Service,¹² in addressing the Annual Meeting of the Irish Dental Association in 1966:

'The time has come when the public is entitled to a voice in the organisation, financing, scope and delivery of health services. With sound professional guidance, the public's participation will be a contribution to improved systems—not an interference in professional practices.

In a democratic society, there must be ways of accommodating different points of view and different ways of doing things. Tolerance enables a free society to work. In the development of better systems of health care, new methods and reasonable alternatives must be tested. There is no place for professional inflexibility. New programmes must be hammered out after acceptable solutions have been agreed upon. The same critical spirit that has produced remarkable advances in the health sciences can produce the best health care for the greater number of people.'

Similar views are expressed by Michael Romano.¹³ He asks: 'What will happen to the demand for dentistry when an affluent, well-educated society is bombarded with the facts concerning the desirability of optimum oral health,' and replies, 'In most other areas of human endeavour we have seen an increase in demand resulting in the development of a new, better, more efficient way of satisfying the demand . . . hospital auxiliaries, medical technicians, oral hygienists, dental assistants, and high speed hand-pieces are examples of this phenomena . . . What the public wants in greater quantity it usually wants and gets at lower cost,' and then he proceeds to ask two other questions. 'How diligent have we been in attempting to bring better dentistry to the public at lower cost? For instance, have we utilized wherever possible the lowest salaried personnel capable of doing a particular job well?'

¹² E7, page 132.

¹³ E8.

Recent British and American literature contains many writings in the same vein. We have given mainly quotations appearing in Irish journals for convenience of reference. It must, however, be admitted that all these are by foreigners, though very eminent in the international dental profession. The only Irish dentist who in recent years has written on ancillaries is Dr. Owens of the Dublin Dental Hospital, the present Chairman of the Irish Dental Board. His viewpoint is rather different. He concludes an article on 'Auxiliary Dental Personnel' with the sentence, 'However, until all our present dental surgeons are fully employed we do not wish to have any dilution by introducing a category of Dental Nurse.'¹⁴

Fluoridation of Water Supplies

By far the most important advance in preventive dental science has been the discovery that fluoridation of water to the extent of 1.0 to 1.5 parts of fluoride in 1 million parts of water has a beneficial effect on teeth and reduces the incidence of caries in children who consumed such water since birth by approximately half. Fluoride was first added to water in a few areas in the United States and Canada some 24 years ago and in 1965 some 60 million people in the US and four million in Canada were reported to consume fluoridated water.

In continental Europe the introduction of fluoridation has been rather slow, though a number of experiments, most of them on a small scale, were carried on in the 1950's. The purpose of these experiments was to test whether differences in water consumption and living conditions would require a different level of fluoridation than in North America. There was also some doubt about the effect of differences in dietary habits and standards of living, both of which affect caries prevalence.¹⁵ It is possible to add fluoride to bread and to milk but it is generally recognised that addition to water is the most effective. The reason for this is that fluoridation has only a limited effect on teeth which have already erupted and is most beneficial if it is available continuously from conception while the teeth are forming and calcifying. The fact that very young children eat little or no bread and that milk consumption is least for children from poorer homes greatly limits the effectiveness of fluoride added to these substances.

In most European countries the proposal to fluoridate water met with opposition in spite of support by the medical authorities in the United States and in the World Health Organisation. The Expert

¹⁴ E9.

¹⁵ E10.

Committee on Water Fluoridation of the World Health Organisation summarises its conclusions:—

- (1) Drinking water containing about 1 p.p.m. of fluoride has a marked caries-preventive action. Maximum benefits are conferred if such water is consumed throughout life.
- (2) There is no evidence that water containing this concentration of fluoride impairs the general health.
- (3) Controlled fluoridation of drinking water is a practicable and effective public health measure.¹⁶

In many countries the objection against adding fluoride to water was based on the alleged undesirability of mass-medication and this agitation was aided by the Pure Water Association who operate in many countries. In Ireland the Minister for Health set up a Fluoride Consultative Council which reported in 1958. The membership of this Council covered a large variety of different interests including dentistry and medicine. The Council's Report was unanimous in recommending that it was desirable to provide for fluoridation of public water supplies to a level of '1 part per million F'. The Government implemented these recommendations in the Health (Fluoridation of Water Supplies) Act, 1960 with the full support of the Irish Dental Association.¹⁷ In the debate in the Dail the opposition argued against making the fluoridation of water mandatory on the local health authorities. They favoured permissive legislation leaving it to the discretion of each authority whether or not to fluoridate. Permissive legislation has been the rule in most European countries including Britain and Northern Ireland. The result has been a very slow spread of fluoridation. This can be seen by the fact that in 1967 one million people in the Irish Republic were receiving fluoridated water but only three million in the rest of Europe.

There are more than 650 separate public piped water supplies in the State but the vast majority of these are very small and are not suitable for inclusion in the scheme. A total of 192 supplies are scheduled for fluoridation. By mid 1968, 20 supplies were fluoridated. These covered a total population of 1,063,000, including the four county boroughs. The earliest fluoridation was in Dublin in July 1964. Originally this had been scheduled for 1962, but was delayed by a lawsuit claiming that the fluoridation of water was unconstitutional. This plea was rejected by the High Court and on appeal, by the Supreme Court.

¹⁶ E11, page 21.

¹⁷ E12.

The fluoridation programme will be completed by 1970 and will then cover approximately half the population of the State. In planning the future organisation of dental services it must be remembered that one half of the population is likely to have a much lower caries prevalence rate than the other. The Department of Health is at present experimenting with a variety of schemes in the areas not covered by piped water supplies or by supplies too small to be suitable for fluoridation. One of these is fluoride mouth washing supervised by public health nurses. There seems every hope that such measures will have a limited success but experience abroad indicates that preventive measures which operate only after the teeth have erupted are of restricted efficacy.

Water fluoridation was an innovation which the government pursued with vigour and determination. The decision to make fluoridation mandatory has proved in retrospect eminently desirable and has given Ireland an advantage over all European countries. The benefit of the 1960 Act in spite of its implementation being delayed by a long drawn out lawsuit will soon result in a marked and steady decline in the caries rate among children. Water fluoridation is possibly the most outstanding measure in the public health field undertaken since the foundation of the State.

VII. DEMAND FOR DENTAL SERVICES

Factors Affecting Demand

Dentistry as an academic profession goes back only to the beginning of this century and obtained statutory recognition less than 50 years ago. During this period techniques employed by dentists have undergone great changes and the nature of dental disease has almost certainly altered, though the evidence for this cannot easily be obtained.

The need for dental treatment with the objective of making a person dentally fit is much greater than the willingness of people to undergo this treatment, even if it is rendered free of charge. When dental services are subject to fees this accentuates the general reluctance of the public to visit the dentist. The desire for dental treatment appears to be related to general standards of living, to culture and to social class.

Two other factors which affect the public's willingness to receive dental treatment are accessibility and surgery times. The further people have to travel to visit the dentist the less likely are they willing to do so. There is some evidence both in Ireland and other countries that in rural areas the rate of dental consultation is remarkably lower than in urban areas. The willingness to visit the dentist at night or on Saturday mornings outside normal working hours may in certain conditions be greater than if a visit to the dentist requires taking time off work.

The prospect of reducing the incidence of caries by change in dietary habits, especially of children, seems remote. In a society where the probability of cancer has only a minimal effect on habits of smoking it does not appear likely that parents will restrain their children from eating sweets and ice cream in order to protect them against attack by dental caries. Brushing of teeth amongst children may well have only a limited affect on the incidence of caries, as was shown in a study done in Dundee.¹ The trend towards eating the

¹ F1.

kind of food detrimental to dental health appears strong and irreversible. The improvement in the state of health which could result from health education is undoubted and considerable. The efficacy of such education must be considered very dubious.

In future the spread of dental caries will be reduced as a result of fluoridation of water and also possibly by the discovering of a vaccine. The ill-effects of caries may be reduced further by conservative treatment being enjoyed by more children and adolescents. This decline in the incidence of caries may well result in an increase in periodontal diseases for which treatment is still of more limited efficacy. The position in this respect would be somewhat similar to the decline in mortality in early ages of life increasing the number of people who die from the diseases of old age, such as cancer.

In discussing dental services in Northern Ireland it was shown that in recent years the demand for these services greatly increased even though the services are completely free for three-fifths of patients and for the remainder at a maximum charge of 30/-. It appears that the increase in demand is one of the effects of increases in the general standard of living. This supposition is also borne out for Ireland by the remarkable increase in demand for dental services under the social welfare scheme which, except for dentures, is completely free.

Dental Consultation Rates

The volume of dental consultations in the United States in 1963/64 is shown in Table 12. This shows three outstanding characteristics of demand for dental services, all of which are rendered at unsubsidised fees. First, the consultation rate for females at all ages is higher than for males. Second, the consultation rate for males and females rises steeply with income. It is for all ages, on average, almost four times as high for persons with family incomes over \$10,000 than for those with incomes under \$2,000 per year. Third, the consultation rate declines with advancing age.

No statistics giving income and age of patients for any recent years are known to exist for any country other than the USA but for England and Wales the Survey of Sickness, 1950, provides statistics based on a random sample of some 36,000 interviews.² (See Table 13.) This survey refers to a period between 18 and 30 months after the introduction of the National Health Service during which time dental treatment was provided completely free. Virtually all the consultation rates quoted would at that time refer to National Health Service patients. It is interesting to note that the three

¹ F2.

Table 12

Mean annual rate of dental consultations per 100 persons by family income, sex and age, USA, July 1963–June 1964

Dollars	Men					Women				
	15–24	25–44	45–64	65+	All Ages	15–24	25–44	45–64	65+	All Ages
Under 2,000	110	•	90	•	70	150	110	70	50	80
2,000—3,999	100	80	80	•	70	130	140	130	80	100
4,000—6,999	160	140	110	90	130	210	190	180	120	160
7,000—9,999	210	210	170	•	180	250	230	200	•	210
Above 10,000	310	240	280	230	260	370	310	320	•	300
All Incomes	180	160	150	80	140	220	210	180	80	170

*Sample too small to give reliable rates.

N.B. These rates in the US publication are given per person and have been multiplied by 100 to make them easily comparable with the English rates.

SOURCE:

National Center for Health Statistics, Series 10, No. 23, Table 3 (USA).

characteristics highlighted in respect of fee-paying dental consultations in the USA are also prevalent in the free dental service for England. Even if services are not paid for, the consultation rate in the highest income group is two to three times as great as in the lowest group. The demand for dental services appears not merely to be related to the ability to pay but to cultural and educational factors, which usually are closely related to income. In England too the demand by females is larger than that by males. The inverse relation between dental consultations and age is also present, but much more accentuated than in the USA.

The volume of consultations in the USA in 1963/64 is almost three times higher than it was in England in 1950 but the English figures since then have increased very sharply. The total number of claims between 1950 and 1967 virtually doubled. Prior to the introduction of the British Health Service—July-December 1947—the mean annual consultation rate for males was 26 and for females 30 per 100 interviewed, i.e. it was twice as much in 1951 as it had been four years earlier.³

The English figures are analysed by income groups of persons interviewed while the American figures are analysed by family income. However, these differences do not affect the validity of the comparison.

No information is available about dental consultation rates for the Irish social welfare dental services under the treatment benefit scheme; the only records kept refer to claims, that means courses of treatment, and these may involve one or several visits to the surgery.

³ F3, page 47.

Table 13

Mean annual rate of dental consultations per 100 persons by income group of person interviewed, sex and age, England and Wales, 1950

Actual Income	1968 Equivalents £	Men				Women			
		16-44	45-64	65+	All Ages	16-44	45-64	65+	All Ages
Up to £3 per week	9	71	29	18	37	68	39	20	38
Over £3 and up to £5	9-15	50	36	15	39	64	44	17	51
Over £5 and up to £7 10s.	15-23	58	31	52	49	74	31	21	60
Over £7 10s. and up to £10	23-30	75	36	.	61	111	50	.	91
Over £10	30+	110	70	.	88	127	79	.	104
All Incomes		65	36	22	51	81	41	18	59

*Sample too small to give reliable rates.

SOURCE:

W. P. D. Logan, A Survey of Sickness, 1943 to 1952, General Register Office, 1957, Table 11.

VIII. FUTURE PATTERN OF SERVICES

Extension of Public Services

In the White Paper on Health Services it is suggested that 'the scope of the (*dental*) service be extended in accordance with section 21 of the Health Act 1953 so as to make it available at charges to whole-time pupils at Vocational and Secondary schools, and the middle income group generally. In the case of insured persons, the last mentioned service would replace the dental benefits which they may receive under the scheme now administered by the Department of Social Welfare.' Paragraph 96.

This passage in the White Paper proposes an extension of a subsidised service to certain groups of the population who at present are entitled to none and appears to suggest the introduction of charges to social insurance contributors who now receive conservative treatment and extractions free of charge.

The number of people in the State above the age of 15—the minimum school leaving age after 1970—was 1,984,000 in 1966. They may be classified into five groups:—

- (1) 82,000 aged between 15-16½ who are not entitled to any dental benefit.
- (2) 710,000 aged between 16½-70 who are insured employees for all benefits including free dental services except for dentures, which they can receive at a subsidised fee.
- (3) 248,000 (estimated as one-eighth) belonging to families where the head of the household earns more than £1,200 per year, the so-called higher income groups, who are with few exceptions not entitled to any free or subsidised health services.
- (4) 735,000, the remainder aged between 16½-70, a heterogeneous group including adult dependents of insured workers, small farmers, shopkeepers and their dependents and family members assisting them.

(5) 209,000, aged above 70 and assumed to have retired. Amongst the 1,654,000 people in groups (2), (4) and (5) are about 586,000 who belong to the so-called lower income group. They have received a General Medical Card after an income and means test, and are entitled to receive all medical services free of charge. The dental service they actually receive is very rudimentary, more or less an extraction service. The cost of this treatment in 1967/68 was £110,000, less than 4/- per head.

The cost of providing free dental services (excluding dentures) under the social insurance scheme for 710,000 persons was £542,000 in 1967/68. The cost of providing a free conservative and extraction service for group (4), those aged 16½–70 who are neither insured employees nor belong to the higher income group, would be about £561,000 on the assumption that the claim rate for this group would be the same as that for insured employees. This is a very conservative assumption; the actual rate would almost certainly be lower as the rural population would claim less than urban employees and as the average age of this group is higher than that of employees. These two factors would only be partly offset by group (4) containing a larger proportion of women. Contribution by patients of 20/- per claim would amount to approximately £118,000. If it was also decided to charge persons in Group (2), those covered by the social insurance treatment benefit scheme, a fee of 20/- per claim, this would yield approximately £113,000.

To provide a free service for adolescents aged 15–16½ would be relatively expensive as the claim rate for this age group is high, say 30 per cent. The cost might be about £95,000.

In considering these estimates it must of course be borne in mind that the cost would rise annually, as past experience at home and abroad shows that demand for dental services rises more than proportionally when incomes increase.

Experience in Northern Ireland and in Denmark indicates convincingly that in the treatment of children a school dental service is more efficacious than free or subsidised treatment by general dental practitioners. In spite of dental treatment in Northern Ireland being completely free for children under 16, 65 per cent of all children whose teeth are inspected are found to require treatment.¹ A large proportion of children in rural areas and many children, particularly those with an unsatisfactory home background in urban areas, only receive treatment if this is provided by public dental officers. This is also the case in Denmark where it was found

¹ D4.

under the private plan that 'only children of conscientious parents receive treatment. Thus many of those who need treatment the most are not cared for'.²

The principle of a public dental service for national schools is re-affirmed in the White Paper:

'It is proposed as a first step to expand the dental staffs of health authorities and the facilities at their clinics, so that there can be a fully effective treatment and follow up service for the children and others now entitled to priority of treatment.'
Paragraph 96.

To provide a high standard of dental service for the 500,000 children in Irish national schools would require, even after the beneficial effects of fluoridation will have materialised in a few years time, some 400 to 500 dentists. These it would be difficult, if not impossible, to recruit. If the work was done by private practitioners it would require a virtual doubling in their numbers and would be a great financial burden on public authorities. In the care of children's teeth a public service staffed by a dental team containing all grades of ancillaries has great advantages from all points of view. The cost of treatment by an auxiliary rather than a dentist would represent a saving of about one third (see Appendix IV).

Remuneration of Dentists

Dentists giving treatment under a Public Health programme can be remunerated in three ways:— (1) Remuneration based on time, (2) capitation fee, (3) fee for service, or a combination of any two or three of these. The first method might either take the form of a monthly salary or a sessional fee. The former is incompatible with private practice but sessional fees have proved reasonably acceptable and popular to dentists in Ireland. They have, however, the disadvantage of not establishing any relationship between remuneration and quantity and quality of work performed. Capitation fees for dentists present a number of difficulties.* The idea of paying a dentist per person registering with him would have the advantage of encouraging high quality work. No country is known to have attempted this method of payment. Remuneration on a fee for service basis is by far the most common. It is of course the normal basis of charging private patients and is used in remunerating dentists in the social welfare scheme of Denmark and New Zealand (for 14 and 15 year olds only) as well as in Northern Ireland. The latter scheme is not a straight fee for service scheme but has some peculiar features. The net earnings before tax are determined by the

*These are discussed in the Tattersall Report BDJ October 1964.

² C2.

Review Body of Doctors' and Dentists' Remuneration. The Dental Study Group then establishes fee scales for each operation which, related to a certain number of hours worked per year and after deduction of expenses agreed by the Inland Revenue, should give the average income determined by the Review Body. This system implies that increased output of the individual dentist will increase his earnings while an overall increase in output will lead to a reduction in the scale fees. This is implicit in the Review Body determining average earnings and the individual dentist's remuneration being directly related to his output.

The dual advantage of this system is that it encourages output and prevents any escalation of cost. Its great disadvantages are that the incentive to earn more by working faster may result in low standard of work and that it may lead to over prescribing. The Northern Ireland system of remunerating dentists might at its worst encourage the bad dentist to fill a tooth using all kinds of short cuts in five minutes and thus reaping three advantages: the patient will have been pleased to be kept only for a short time in the unpopular dentist's chair and will become a regular client; second, he will become a steady client as his filling will not last many months and thirdly, the patient will tell his friends how speedy the dentist is. This system of remuneration may lead to a situation where bad dentistry drives out good dentistry. There is, however, no evidence whatsoever that this has actually happened in Northern Ireland.

Public authorities fixing scale fees can encourage or discourage certain operations by making them more or less profitable. Any scale of fees is likely to influence the dentists' clinical freedom.

Looking into the more distant future Dr. Letherman writes:—

'I am sure that the future pattern of practice must develop with teams working in clinics, run at first by the state and privately, but I believe that ultimately the state will almost exclusively build and maintain health clinics with the dental service manned by a director, acting as administrator. Consultants, or specialists, dentists and auxiliary staff all working together.'³

This appears an intelligent and perceptive prognosis which would be shared by an increasing number of far-sighted people in the dental profession all over the world. The projected health centres in Northern Ireland may ultimately provide the full range of services which would of course include dental care, preventive as well as conservative.

In the future people requiring dentures may be exceptional but for the children and young people of today over the next 50 years or

³ E1, page 15.

so the need for dentures will be great. For the Government to underwrite an open-ended commitment to supply dentures free or at heavily subsidised rates might result in very considerable expense. Dentures supplied by a private practitioner will rarely cost less than £21 and may well cost twice as much. For dentures under the Social Welfare Treatment Scheme the dentist receives £14 10s. of which the patient pays £10 11s. The demand for dentures for people who are edentulous and have been so for some time is very difficult to estimate.

From the clinical point of view it appears desirable to have conservative treatment, extractions and supply of dentures provided by the same dentist. From the point of view of cost and the best use of resources there may be an argument for free and subsidised dentures to be supplied only in health centres. Such centres in any case might well be, in the urban areas, the natural place for the dispensing of dental services. An efficiently run dental hospital like the one in Dublin appears to be popular with the patients and capable of the economic use of equipment. In such centres the employment of ancillaries should also be an integral part of the system.

Regional Differences

Anybody looking at the present position of various kinds of community services in the State must be conscious of the great differences between Dublin, Cork and some of the smaller urban centres on the east coast on the one side and the midlands and the west on the other. In considering the development of dental services it may be mistaken to think of a uniform structure, system and practices throughout the country. There may well be a strong case in many of the western counties to appoint public dental officers part-time and allow them to have private practice. Such a scheme would have the dangers to which reference is made above but it could have the advantage of keeping a dentist in a small town where he would have insufficient private patients to earn a reasonable livelihood. Such appointments might also have the advantage of economising capital equipment and preventing lengthy journeys by public dental officers.

The kind of pattern for school dental services might not be unlike that recommended for the child welfare service in the recent Report on Child Health Services.⁴ It might be argued that such dental surgeons combining public employment with private practice should be remunerated in respect of their work with school children on a fee for service basis. On balance, however, this seems undesirable,

⁴ F4.

as it could not easily be reconciled with the employment of various grades of ancillary staff and proper preventive care. It would hardly be proper in public employment to remunerate the dentists on a fee for service basis while the other members of his team are paid a monthly salary, nor would it be proper and possibly even dangerous to pay ancillary staff by piece-work. The kind of conditions appropriate for the remuneration of such dentists may well be like that of medical and dental officers in the Northern Ireland hospital service or employment in the Dublin Dental Hospital.

Finally, dentists like other professional people appear to be increasingly attracted by work in large towns. As it is in the public interest to provide reasonable health services in all areas of the State it may be necessary in future to have salaries differentiated by area in such a way as to contain an inducement for dentists to move to less popular places.

Two Level Dentistry

Some dentists object to 'two level' dentistry. They suggest that all patients should receive the same treatment from fully qualified dentists and appear to imply that this is the position in Ireland today. This is true only in the narrow sense when using the term two level to distinguish between treatment by a person with a professional qualification and a person who has no such qualification. Using the term two level in its literal sense the situation is certainly quite different. A very large proportion of all children and adults actually receive no treatment whatsoever and many of those who do, amongst the lower income group and sections of the middle income group, receive an extraction service rather than professional dental treatment. On the other side of the social spectrum well-off patients who require certain types of periodontal treatment or whose children require orthodontic treatment have every right to expect that their dental general practitioner will refer them to a specialist. In Ireland today, dentistry is 'many levelled'— from the minimal to the very best. There will always be a comparatively small number of people who desire and can afford the highest standard of dentistry in conditions of privacy in a pleasant environment. In this type of practice there will be fewer ancillaries and the patient will expect to be treated as a person of consequence, with some social chit-chat being inter-mingled with first-rate professional care. Of course this type of practice can never be the pattern for a service covering the whole population.

Not for many years to come, if ever, will it be possible to provide a much better standard than in the past. Fluoridation will reduce the

need for treatment and the employment of all grades of ancillaries, especially dental hygienists and the New Zealand type of school dental nurse, would make this economically feasible. The professional dental surgeon will find his work much more rewarding and interesting once he has understood what is meant by being the leader of a team rather than an all-purpose provider of services. He will be relieved of much of the tedious repetitive routine and will be able to concentrate on encouraging and advising his staff and will himself undertake only work requiring the higher levels of professional skill.

An amendment to the Dentists Act to enable the Minister for Health to make regulations for the establishment of classes of ancillary dental workers deserves urgent consideration. The regulations could prescribe the qualifications required for these dental workers and the work they would be permitted to undertake. It might also be desirable to establish a roll or register of all such persons. The New Zealand type school dental nurse should be introduced, at least in the public service. These might be known as 'dental therapists', a description rather more prestigious than 'dental nurse', and much superior to the British term 'dental auxiliary'. It would also put these ancillaries on the same level as such para-medical staff as physiotherapist, speech therapist and occupational therapist—people who are competent technicians and recognised as such by the public but do not aspire to be technologists. The training of dental therapists would take two years after Leaving Certificate instead of $5\frac{1}{2}$ to 6 years for a dental surgeon and would be correspondingly cheaper as it would be restricted to a more limited field. Ideally dental therapy students ought to be trained in the same hospital as undergraduates. The remuneration of dental therapists would be at the same rate as other para-medical staff—say at about 75 per cent of a national school teacher. There is also a case for introducing a grade of dental hygienist who would be permitted to work in the public service and be employed by dental surgeons in private practice.*

*For discussion of current and capital cost of employing dental therapists, see Appendix IV.

IX. PRIORITIES IN PUBLIC EXPENDITURE

Public expenditure on dental services in 1967–68 under the social insurance benefit scheme was £606,000, for child dental services was £342,000 and for lower income group services £110,000—a total of £1,058,000. For 1969–70 this may well be £1,400,000. To maintain the present level of services and the present policy requires an annual increase in expenditure. This is partly due to the general inflationary trend and partly to the increasing claim rate under the social insurance scheme.

If the government were to decide to spend some additional funds on dental services what benefits could be derived from such an expenditure? About £561,000 at 1967–68 prices would be sufficient to provide free dental services, excluding dentures, for all persons in the lower and middle income groups aged between 16½–70 who are not eligible at present. If all those persons and those eligible at present under the social insurance treatment benefit scheme were charged £1 per course of treatment, the cost would be reduced by about £231,000.

A free service for adolescents between 15 and 16½ years would cost about £95,000 at 1967–68 prices. The employment of an additional dental officer in the public service including travelling expenses, consumables, capital charges, rent, replacements and salaries of chairside assistants, costs about £4,000 to £5,000. Thus, approximately 20–25 officers could be employed in the public service for each £100,000. This would present an increase in staff in the child health services of about one-fifth.

The Government's decision to increase the number of public dental officers has led to an increase in their salaries and in the number of approved posts from 118 to 141, between October 1967 and February 1969.

This has as yet only resulted in an increase in the number of posts filled by 15, while the number of posts vacant increased from 20

to 28. Any recruitment at salaries approximately similar to those across the channel is likely to prove as difficult in the future as it has been in the past. If salaries were raised significantly above those paid in Britain, further recruitment should be possible.

The provision of free dental services to children under 15 years by private practitioners on a fee for service basis has proved unsatisfactory and insufficient in other countries. A properly organised dental service employing a dental surgeon at the head of a team of auxiliaries would provide a service which would be more extensive and more economical.

The Irish Dental Association claims that many of its members are not fully occupied. It should therefore be possible for the dentists at present in private practice to treat more patients under a scheme similar to the present social insurance treatment benefit scheme. As a first step, free treatment might be provided for all persons between 15 and 21 in the lower and middle income groups who are not at present covered by social insurance. As a second step, subsidised treatment at a charge of £1 per claim might be extended to those aged 21–30. The additional cost of the first step (at 1967–68 prices) would be £181,000 and of the second step would be £161,000. Such a gradual extension of benefit would test the ability of dental practitioners to provide this service and possibly attract some to return to Ireland.

For an annual expenditure of some £20,000 to £25,000, it would be possible to train ten dental therapists per year. The cost of providing dentures in Northern Ireland is about £12 and in the Republic, under the dental benefit scheme, £14 10s. On this basis some 70,000 dentures might be provided for an expenditure of £100,000. This compares with the provision of 7,000 to the lower income groups in 1967–68.

The allocation of additional funds between various dental services is a matter of political judgement. The purpose of this section has merely been to indicate what could be achieved for different levels of expenditure. In the author's view, the small expenditure for training of dental therapists deserves the highest priority.

SUMMARY

I Introduction

The introduction covers a statement of the objectives of the paper followed by a brief outline of the relevant economic and social conditions peculiar to Ireland. Dental services are defined, the main dental diseases are enumerated and the nature and importance of preventive measures are stressed.

II State of Dental Health

The state of dental health of school children was surveyed in the early 1950's and the early 1960's. The findings of the surveys are very similar. Half the deciduous teeth of the seven-year-olds and one-quarter of the permanent teeth of both the seven and the twelve-year-olds were found to be decayed, missing or filled. The number filled was negligible.

Little is known about the state of dental health of adults. A survey in Cork County Homes in 1965 showed that half the men and almost half the women were edentulous and that very few had adequate natural teeth.

Dental examination of Irish Army cadet candidates showed an average of 12.9 DMF teeth. Half of the candidates had five or more decayed teeth, and more than two-fifths had five or more missing. Amongst Irish Army recruits and apprentices three-quarters had five or more teeth decayed and more than three-fifths had five or more missing.

III Dental Manpower

The practice of dentistry under the 1928 Dentists Act is restricted to registered dentists, virtually all of whom are qualified dental surgeons. No type of ancillary is permitted to perform any operation in the oral cavity. The practice of medicine is not restricted to anything like the same extent.

The population/dentist ratio is very high by European standards. In 1967 about 700 dentists were on the register, of these 14 per cent were women. Two-thirds of the men and three-quarters of the women were in the first half of their working life. About one-quarter of all active dentists were employed in the public service.

Primary dental qualifications are provided in four colleges and students receive their clinical training in either the Dublin or the Cork Dental Hospital. An Irish primary dental qualification confers entitlement to practise in the United Kingdom. The standard of the courses is inspected periodically by the British General Dental Council. The number of students qualifying fluctuates from year to year and is about 60 at present. It is intended to build a new dental hospital in Dublin to provide facilities for qualifying 50 students per year and a new hospital in Cork for 25 students per year. A large proportion of all dentists who qualify work abroad. (See Appendix I).

IV Organisation of Dental Services

A treatment benefit scheme provides free conservative dental services and subsidised dentures for employees who are engaged in a manual capacity or, if engaged in a non-manual capacity, earn less than £1,200 per annum. In 1967, 30 per cent of the women and 14 per cent of the men entitled claimed this benefit. The proportion claiming is inversely related to age. The number of claims increased by one half over the last seven years. The service is provided by private general practitioners who are paid by the Department on a fee for service basis. Almost all private practitioners participate in this scheme which in 1967 provided them with an average gross income of £1,450.

All children attending national schools—some 500,000—are entitled to free dental services. These are provided mainly by public dental officers and are of a fairly rudimentary nature. Fillings of deciduous teeth are rare, one filling per 10 extractions. The service provided is somewhat better in Dublin than in the rest of the country. In 1967 there was one dentist for about 4,000 school children. The cost of treatment was about 14/- per child. The service provided for pre-school children is minimal.

Nearly 600,000 adults on the basis of an income and means test are given medical cards which *inter alia* entitle them to free dental services. These are of a most rudimentary kind. In 1967, 38,000 were examined, 80,000 teeth were extracted, 4,000 were filled. The total number of dentures provided was 7,000. The estimated cost of this service was four shillings per person entitled. Even for expectant and nursing mothers in this group the service was minimal.

In 1967 there were 77 men and 28 women public dental officers. As a result of salary increases this number has increased recently. The present salary is about the same as that in Northern Ireland. Private practitioners participate in the service by working 800 sessions per month. The number of private dental practitioners is equivalent to approximately 430. Their average gross income is conservatively estimated as between five and six thousand pounds per annum with approximately half going on expenses. No information about private patients is available.

V Dental Health and Services in Other Countries

Northern Ireland

In Northern Ireland like in other parts of the United Kingdom dentists may be assisted by two new types of ancillaries, dental hygienists and dental auxiliaries. The work these ancillaries may legally perform is discussed in detail. Dental treatment under the National Health Service was originally rendered to the whole population without charge to the patient. At present almost three-fifths of all treatment, that of expectant and nursing mothers and young people under 21, is still completely free. Other persons pay a maximum charge of 30/- for conservative treatment and £5 for dentures. In recent years the number of courses of treatment, the number of dentists and the productivity of dentists has increased markedly.

In spite of children receiving free treatment under the general dental scheme large numbers of school children are found to have defective teeth and a special school dental service is considered essential.

Denmark

The population/dentist ratio in Denmark on the whole is remarkably low but like other countries there are considerable geographical variations. About two-fifths of all dentists are female, most of these work in the school dental service. Almost half the school child population has the opportunity of systematic examination and treatment by public dentists who specialise in child dentistry and about 95 per cent avail of it. The children not covered by the school dental service are covered by a private plan.

Virtually the whole of the adult population is covered for dental services, excluding dentures, by a health insurance scheme. This provides for two-thirds of the cost of all dental treatment and for the younger age group as much as three-quarters, if they agree to regular dental examinations. The estimated expenditure on dental services per person over 15 was about 37/- in 1968 and per child under the school dental service more than £10 per year.

New Zealand

The remarkable feature of dental services in New Zealand is the widespread employment of auxiliaries, mainly school dental nurses. These nurses are permitted to fill both deciduous and permanent teeth. The dental nurse is school centred and is responsible for the dental health of about 500 children throughout their primary school life.

In 1966, 98 per cent of all children attending primary and intermediate schools received regular dental care—88 per cent by the school dental nurse and 10 per cent under the general dental benefit scheme. Using the criteria of extractions per 100 fillings, the state of dental health has greatly improved since the introduction of this service. In 1925 it was 73 and in 1968 it was three.

Adolescents up to 16 are cared for by dentists on a fee for service basis contract with the Department of Health. In 1962–64 it was found that about two-thirds of all 18 year olds had received regular treatment throughout their life. The estimated cost per child covered by the school dental service in 1967 was £3 7s.

United States

The state of dental health in the USA is astonishingly low. It is estimated that at least one in every four adults has no natural teeth in either one or both jaws. Almost 80 per cent of all adults suffer from some degree of periodontal disease. The dental consultation rate was about 1.6 per person and was strongly correlated to income. Women spent more than men and expenditure declined with increasing age. Virtually all dental services are rendered by private practitioners. The number of dental hygienists in 1967 was only 15,000, i.e. 16 per cent of the number of dentists, but is increasing rapidly.

VI Preventive and Curative Dental Services—Some Issues

Public dental officers are relatively expensive to employ, difficult to recruit and insufficient in number to render a satisfactory service. The restriction of the practice of dentistry to dental surgeons may at least be partially responsible for the low level of service provided.

The World Health Organisation approves and recommends the employment of ancillaries who may practise dentistry within certain limitations. This view is expounded and supported by the Secretary-General, Federation Dentaire Internationale. Ancillaries could play an important role in prevention of dental caries and periodontal diseases. The widespread impression among dentists that the employment of ancillaries would reduce both their status and

income appears ill-founded. The case for re-organising the structure of dental services is supported by quotations of other eminent dentists. The structure and nature of any professional service should not be determined by its members. The interest of the recipients of the service ought to be taken into account. The professions are not necessarily the best judge of where that interest lies.

By far the most important method for preventing dental disease is believed to be water fluoridation. This has been strongly recommended by the World Health Organisation. In this country fluoridation was made mandatory on water suppliers in 1960. At present more than one million people in the State consume fluoridated water. In Britain and continental countries merely permissive legislation has delayed the implementation of water fluoridation considerably. Mandatory fluoridation was possibly the most outstanding measure in the public health field since the foundation of the State. It will result in an appreciable reduction in dental caries in the 1970's.

VII Demand for Dental Services

Dentistry as a profession obtained statutory recognition less than 50 years ago. The need for treatment even if it is free, is usually greater than the willingness to undergo it. Geographical accessibility and surgery hours also affect willingness.

The efficacy of dental health education in the prevention of dental caries in children is very dubious. Fluoridation and more comprehensive conservative treatment for children and adolescents will reduce caries but the need for dentures will be very great for many years to come.

Evidence from other countries suggests that demand for services increases more than proportionately with rising incomes, that demand by women is higher than by men and that it declines with increasing age.

VIII Future Pattern of Services

The White Paper on Health Services and their Further Development (1966) proposes an extension of public dental services. At present amongst the two million adults in the State, 710,000 are covered by social welfare dental benefit, approximately 248,000 belong to the higher income groups, 209,000 are above the age of 70, 82,000 are between 15 and 16½ and 735,000 don't belong to any of these categories. It is estimated that to provide a free conservative and extraction service for the latter group would cost an estimated

£561,000. Contribution by patients of £1 per claim would reduce this to £443,000. A free service for the 15-16½ year olds would cost about a further £95,000. These costs, in line with the increasing demand for dental services with rising incomes, would inflate in future years. Experience abroad seems to indicate that for children school dental services are more comprehensive and less costly than those provided by private practitioners. An open-ended commitment for the provision of free dentures might lead to large expenses which would be difficult to estimate. The supply of dentures might be more economically provided by public dental officers than by private practitioners.

In spite of its disadvantages remuneration of dentists on a fee for service basis appears most practical. In rural areas there seems to be a case for appointing part-time public dental officers with permission to practise privately. In some of the less popular areas there may also be a case for special allowances for public dental officers. In the more distant future private dental practice in the towns may be based on health centres.

Dentists have expressed many objections to auxiliaries working directly with the patient in the oral cavity and to what they call 'two level dentistry'. They have suggested that all patients should be treated by dental surgeons and have implied that this is the case in Ireland today. However, very many people receive no treatment whatsoever and some who do merely receive an extraction service. It should be possible to provide a more extensive service than exists at present by the employment of all grades of auxiliaries. The introduction of dental therapists (the New Zealand type of dental nurse) would on a conservative assumption reduce cost of treatment by at least one-third.

An amendment to the Dentists Act to permit the employment of all grades of auxiliaries deserves serious consideration. Another restrictive Act permitting merely the employment of dental hygienists while desirable in itself would be insufficient. Much more preferable would be a provision permitting the Minister to make regulations as regards the qualification of persons who may practise dentistry and the extent to which they are permitted to do so.

IX Priorities in Public Expenditure

Expenditure on all public dental services in 1969/70 will be about £1.4 millions. It is possible to give the approximate cost at 1967-68 prices of expanding public dental services. The extension of free dental services, excluding dentures, to all persons aged 16½-70 in the lower and middle income groups would cost an additional

£561,000. This would be reduced by £231,000 if all patients were charged £1 per course of treatment. A free service for adolescents aged 15–16½ would require some £95,000. For an additional £100,000 some 20–25 dental officers could be employed in the public service. For the same sum it would be possible to provide approximately 70,000 dentures. The training of ten dental therapists a year would cost about £20,000–£25,000. A gradual extension of public services might take the form of providing on a fee for service basis through private practitioners a free service for all in the lower and middle income groups aged 15 to 21 at an additional cost of £181,000. As a second step the introduction of a subsidised service subject to a charge of £1 per course of treatment to those aged 21 to 30 at a cost of £161,000 might be considered. For school children a public dental service having dentists in charge of teams of auxiliaries would be most efficient and economical. It is doubtful whether salaries even marginally above those in Northern Ireland would make it possible to increase substantially the number of public dental officers.

APPENDIX I

DENTISTS PRACTISING AT HOME AND ABROAD

In the seventeen years between 1950–66 (both years inclusive) 934 students obtained their primary qualification in dentistry from the three licensing bodies in the State. (See Table A1.) The number qualifying was as low as 30 in 1953/54 and as high as 76 in 1960/61. Over the period as a whole the number qualifying shows an upward trend (see Chart) but very considerable fluctuations from year to year. The number obtaining a first degree in dentistry from Trinity College over the sixteen years was only 60 and in no year exceeded seven. Licensees of the RCSI totalled 215 and graduates of the National University 659. The number of women qualifying was 142, about 15 per cent of the total, and the proportion was about the same at the three institutions.

How many of these 934 dentists are practising in Ireland? This question can be answered by consulting the Irish Dental Register, which gives for every dentist the date of his primary qualification and the date of his first registration. On the Register of January 1st, 1968 there are the names of 376 dentists who had first registered in the seventeen years under review. Ninety of these registered in the same year as they qualified, 96 in the following year, 76 two years later and 39 three years later. In total 301 registered not more than three years after qualifying and a further 59 within 4–7 years. Over the whole period only 16 registered seven years after qualifying. (See Table A2.)

The figures in Table 2 can be re-arranged to show the number of dentists qualifying since 1950 who were on the Dental Register in 1968. (See Table A3.) It can then be seen that of the 805 dentists who qualified within the fifteen years 1950–64 only 266, say 33 per cent, had registered within three years of qualification. Amongst the 552 who had qualified between 1950–60 only 235,

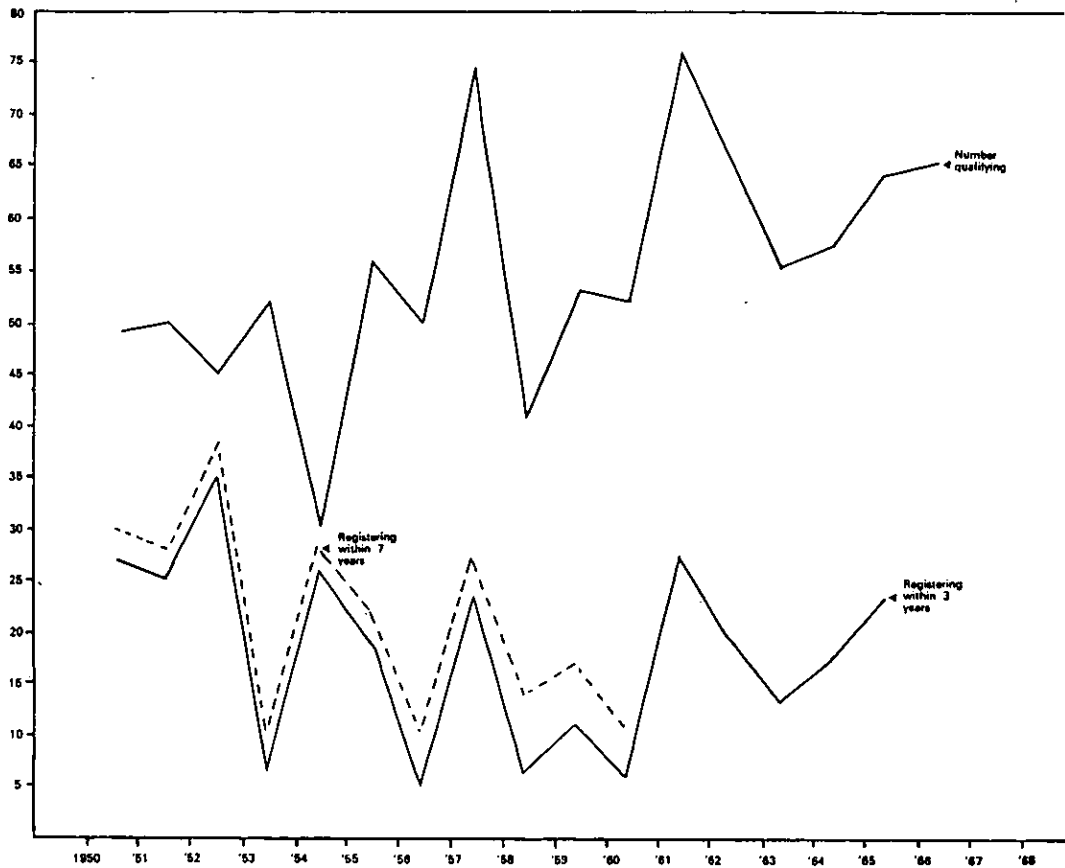
Appendix Table A1
Primary qualifications in dentistry awarded between 1949/50—1965/66

Years	National University			University of Dublin			RCSI			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
1949/50	22	11	33	4	—	4	11	1	12	37	12	49
1950/51	32	3	35	—	—	—	10	5	15	42	8	50
1951/52	24	11	35	2	—	2	7	1	8	33	12	45
1952/53	29	3	32	3	1	4	14	2	16	46	6	52
1953/54	13	4	17	2	—	2	11	—	11	26	4	30
1954/55	36	5	41	3	1	4	8	3	11	47	9	56
1955/56	29	7	36	1	—	1	12	1	13	42	8	50
1956/57	43	12	55	3	2	5	14	—	14	60	14	74
1957/58	22	5	27	3	—	3	10	1	11	35	6	41
1958/59	32	3	35	5	1	6	10	2	12	47	6	53
1959/60	36	7	43	1	—	1	6	2	8	43	9	52
1960/61	48	8	56	6	1	7	10	3	13	64	12	76
1961/62	43	5	48	5	—	5	11	1	12	59	6	65
1962/63	34	5	39	4	—	4	10	2	12	48	7	55
1963/64	30	7	37	3	1	4	14	2	16	47	10	57
1964/65	42	5	47	5	—	5	12	—	12	59	5	64
1965/66	38	5	43	2	1	3	17	2	19	57	8	65
Total	553	106	659	52	8	60	187	28	215	792	142	934

SOURCE:

Statistical Abstract of Ireland 1951/1967 and the Dental Register of the Royal College of Surgeons of Ireland. The figures for the RCSI are not exactly the same as those appearing in the Report of the Commission on Higher Education but it is assumed that the figures quoted have validity as they come from the Register signed by every dentist on qualification.

Number of dentists qualifying and number on register on 1st January 1968
 who had registered within three and seven years of qualifying



Appendix Table A2

Dentists on Dental Register on 1st January 1968 who registered since 1950, analysed by years intervening between first qualification and registration in Ireland

Year of Registration	Years Qualified Preceding Irish Registration								Total
	0	1	2	3	4	5-7	8-12	12+	
1950	10	4	—	1	—	—	—	1	16
1951	9	12	9	1	1	—	1	1	34
1952	11	12	5	4	1	1	—	1	35
1953	2	8	4	—	1	1	—	1	17
1954	8	2	12	—	1	1	—	—	24
1955	8	12	1	4	1	—	—	—	26
1956	1	1	5	2	2	1	—	—	12
1957	8	1	6	1	—	2	—	—	18
1958	3	7	2	4	—	2	—	—	18
1959	4	—	6	1	2	1	—	—	14
1960	—	2	3	2	1	3	—	—	11
1961	6	2	3	—	1	2	—	—	14
1962	2	9	3	2	4	1	—	—	21
1963	1	7	3	1	1	4	1	1	19
1964	3	6	7	9	3	3	2	2	35
1965	4	6	2	3	5	4	—	2	26
1966	10	5	5	4	4	5	2	1	36
1950-67	90	96	76	39	28	31	6	10	376

SOURCE:

Computed from the Dental Register of Ireland, 1st January 1968.

say 43 per cent, had registered within 7 years of qualifying and of these 190, say 34 per cent, within 3 years. The number registering eight or more years after qualifying is very small; in none of the years between 1950-67 did it exceed four and in nine of these it was nil.

The proportion of dentists qualifying who registered within three years fluctuates widely from year to year. It was a mere 10 per cent in 1956 and 12 per cent in 1960 but as high as 87 per cent in 1954 and 36 per cent in 1961. Irrespective of how low this ratio is in a particular year it is not compensated by larger registrations in later years, e.g. only 20 per cent of dentists qualifying in 1956 and only 21 per cent of those qualifying in 1960 have registered within seven years.

On the basis of these figures it appears that in 1968 some 45 per cent of dentists who qualified in the 1950's were practising in the State. The proportion of dentists registering within three years of qualifying is lower than it was for those who qualified in the 1950's. It seems therefore reasonable to surmise that proportionally fewer dentists who qualified in the 1960's will ultimately practise in the State, say 38-40 per cent. This forecast may be upset if exceptionally large numbers return to Ireland four years or more after qualification. These figures are subject to a number of qualifications, none of which are considered to be sufficiently important to lead to any significant distortion. First, some dentists qualifying in the 1950's will have been on the Dental Register at some time but were no longer registered on 1st January 1968; they may have emigrated, died or changed their occupation. Second, some dentists also have a medical qualification and thus are permitted to practise dentistry without having their name on the Dental Register. The number of such men must be small, say half a dozen or so. Only dentists on the Register may treat patients under the social welfare scheme and this is a persuasive reason for registration. Third, a small number of dentists on the Register took their primary qualification abroad; this inflates slightly the proportion of all qualified in the State who work in the State. Fourth, a certain but by no means negligible number of those qualifying have their permanent residence outside the Republic, especially in Northern Ireland. Fifth, the fact that the dentist pays five guineas registration fee does not necessarily mean that he will practise full time in the State. A small number normally practising in Northern Ireland or Great Britain may not consider the small fee a deterrent to registration though they will practise in the State only intermittently.

The reasons which may influence a newly qualified dentist to practise abroad rather than in the State are manifold. They include

Appendix Table A3

Dentists on Register on 1st January 1968 qualifying in year stated, analysed by years intervening between first qualification and registration in Ireland

Year Qualified	Years Preceding Irish Registration				Total Qualifying	
	Up to Three		Up to Seven			
	No.	%	No.	%	No.	%
1950	27	55	30	61	49	100
1951	25	50	28	56	50	100
1952	35	78	38	84	45	100
1953	7	13	10	19	52	100
1954	26	87	28	93	30	100
1955	19	34	22	39	56	100
1956	5	10	10	20	50	100
1957	23	31	27	36	74	100
1958	6	15	14	34	41	100
1959	11	21	17	32	53	100
1960	6	12	11	21	52	100
1961	27	36			76	100
1962	19	29			65	100
1963	13	24			55	100
1964	17	30			57	100
1950-60 (11 years)	190	34	235	43	552	100
1960-64 (5 years)	82	27			305	100
1950-64 (15 years)	266	33			805	100

SOURCE:

Computed on the basis of Table 2.

differences in employment opportunities, in anticipated earnings or in salary, the necessity to repay debts contracted during the years of study and the wish to accumulate some capital. Most dentists who do not register in the State go to practise in the United Kingdom, a few go to the USA or Canada. In all developed countries there is a shortage of dentists. As long as Irish qualifications are recognised abroad there will always be dentists who will practise outside the State.

It is no more than a truism to say that the higher the salary, especially the starting salary of Public Dental Officers, the higher the scale fees of the Department of Social Welfare, and the more people are entitled to free or subsidised dental treatment, the larger will be the number of dentists who work within the State. Income levels and working conditions of dentists in the United Kingdom in relation to those in the State are the main factors determining the number who wish to work at home. It may, however, be also the case that if other things are equal Irish dentists still prefer to practise in an English urban environment than in many parts of rural Ireland. There is little evidence available to support or contradict this supposition.

A detailed investigation into the considerable fluctuation from year to year in the number of students qualifying and the equally remarkable fluctuation in the proportion of dentists registering three years after qualifying could be of considerable interest. This however is outside the scope of this paper. In any case, whatever may have been the reasons in the 1950's the social and economic forces operating in the 1970's are likely to be very different.

APPENDIX II

COST OF DENTAL SERVICES IN NORTHERN IRELAND

The dental consultancy rates for the United States in 1961-63 and for Great Britain in 1950 indicate clearly that demand for dental services is higher for the upper than for the lower income groups and decreases with age. For the United States information is given for the type of treatment received but for no country are there statistics showing an analysis of total cost by nature of treatment. Dental statistics in any case are inherently complicated. Some refer to number of teeth treated, some to type of treatments, e.g. fillings on one side, others to courses of treatment, that means all operations required to make a person dentally fit and frequently including more than one type of treatment and finally, to number of patients treated allowing for the fact that some patients may have more than one course of treatment during the year.

The Northern Ireland Ministry of Health collects data on the cost of treatment of several hundred items on a sample basis. These are given separately for four age groups and for expectant and nursing mothers under and over 21 years. A summary of these figures is given in Table A4. This shows that of all expenditure incurred, including patients' contributions, eight per cent is for expectant and nursing mothers, one per cent for the under-fives, 20 per cent for the 5 to 15's and 15 per cent for the age group 16 to 21. The remaining 56 per cent is in respect of those over 21. Unfortunately the figures do not distinguish between men and women nor are people above the minimum pensionable age shown separately. Allowing for the fact that the age groups given in Table A4 are not uniform the adolescent group appears to make the heaviest claim on dental services. For this group the proportion spent on conservative treatment (76 per cent) is also the highest. However, even for these young people 12 per cent of the cost is in respect of dentures

or extractions. For children of school age the proportion spent on conservative treatment is somewhat lower (65 per cent) while that on extractions and dentures is as high as 16 per cent. The cost of orthodontic treatment is a mere five per cent of the total for that age group. The very large proportion of expenditure on extractions and dentures (34 per cent) for expectant and nursing mothers appears to throw an unfavourable light on the dental services of the Province. For the over 21's some 44 per cent of total cost goes on extractions and dentures.

The figures do not give any indication of the quality of the service. This would require a much more detailed investigation but would not need any additional returns from dentists. A good indication of quality would be the interval at which fillings and crowns require replacement or even extraction. In the presentation of cost in Table A4 low quality conservative work would be reflected in a high proportion of total cost being incurred for such treatment. The *prima facie* criteria that high proportion of cost on conservative treatment is an indication of a high quality service is therefore erroneous. It is interesting to note that a mere seven per cent of expenditure is in respect of clinical examination and report.

In Table A5 an attempt is made to assess the aggregate cost of dental services for school children age 5-15 for the year 1967. For this purpose the figures for the general dental service in Table A4 are aggregated to a yearly basis. Detailed dental operations are obtained from the Reports of the Chief Dental Officers of the eight local health authorities and their notional cost is ascertained by pricing them at the rates applicable to the general dental service. The purpose of this procedure is not merely to estimate the total cost of school dental services but to discover the approximate amount spent on various types of treatment. On this basis 31 per cent of total expenditure is in respect of school dental services.

The relative importance of clinical examination is greater in the school dental service—33 per cent against 11 per cent of the total cost. However, the quality of the clinical examination is not necessarily the same. The cost of orthodontic treatment is a low proportion of both services but slightly more for the general service. Extractions for both deciduous and permanent teeth are more frequent in the general service where they account for 14 per cent of all expenditure.

Appendix Table A4

Northern Ireland

Expenditure on dental services for specific sectors of the population, first quarter 1968

	0-4		5-15		16-20		21+		Expectant and nursing mothers		Total	
	£000's	%	£000's	%	£000's	%	£000's	%	£000's	%	£000's	%
Clinical Examination and Report	1.2	23	14.0	11	7.2	8	17.2	5	2.6	6	42.2	7
Intra Oral Films	0.02	0.4	2.4	2	2.5	3	5.1	2	0.6	1	10.6	2
Orthodontics	—	—	5.7	5	0.9	1	2.4	1	0.3	1	9.3	2
Dentures	—	—	2.8	2	6.4	7	137.7	40	13.0	28	159.9	26
Conservative Treatment:												
Deciduous Teeth	2.7	50	15.4	13	—	—	—	—	—	—	18.0	3
Permanent Teeth	—	—	64.2	52	71.2	76	166.8	48	26.8	58	328.9	54
Extractions:												
Deciduous Teeth	1.4	26	11.0	9	—	—	—	—	—	—	12.4	2
Permanent Teeth	—	—	6.6	5	5.1	5	12.8	4	2.8	6	27.3	4
Other	0.03	0.5	0.5	0.4	0.5	0.5	2.4	1	0.4	1	3.8	1
Total	5.3	100	122.5	100	94.0	100	344.4	100	46.5	100	612.7	100
Percentage of Total		1%		20%		15%		56%		8%		100%

SOURCE:

Ministry Returns 1st Quarter 1968.

Appendix Table A5

Northern Ireland

Expenditure on dental care for children aged 5-15 years, 1967

	General Dental Service		School Dental Service		Total	
	(Actual Cost)		(Notional Cost)		£000's	%
	£000's	%	£000's	%		
Clinical Examination	53.8	11	69.6	33	123.4	18
Intra Oral Films	9.0	2	0.6	0.3	9.6	1
Orthodontics	21.7	5	6.5	3	28.2	4
Dentures	10.6	2	—	—	10.6	2
Conservative Treatment:	306.3	65	115.7 ¹	54	422.0	62
Deciduous Teeth	59.3	13	22.8 ¹	11	82.1	12
Permanent Teeth	247.0	52	67.0 ¹	31	314.0	46
Extractions:	67.6	14	21.0 ²	10	88.6	13
Deciduous Teeth	42.2	9	11.0	5	53.2	8
Permanent Teeth	25.4	5	2.4	1	27.8	4
Other	2.1	0.4	—	—	2.1	0.3
Total	471.3	100	213.4	100	684.7	100

¹ Fillings only.

² Total includes £6,900 for fillings in Fermanagh which are not available separately for deciduous and permanent teeth, and £19,000 for other conservative treatment in all eight Local Health Authorities.

³ Total includes £1,200 for extractions in Fermanagh which are not available separately for deciduous and permanent teeth, and £6,300 for general anaesthetics in all eight Local Health Authorities.

SOURCE:

General Dental Service—Based on the Ministry Returns for the 1st Quarter of 1968 and calculated for the year on the basis that the amounts for that quarter are equal to 26 per cent, this figure being arrived at by taking the expenditure for the 1st Quarter and expressing it as a percentage of the estimated total expenditure for 1968 given in the 20th Annual Report of the General Health Services Board (p. 15).

School Dental Service—Based on the Annual Reports of the eight Local Health Authorities, the amounts calculated by multiplying the items by the (calculated) fees of the general dental service.

APPENDIX III

ESTIMATE OF NOTIONAL COST OF LOCAL HEALTH AUTHORITY DENTAL SERVICES

In Chapter IV reference is made to the cost of public dental services for children and the lower income groups in 1967-68. This was £342,000 and £110,000 respectively. Very conflicting views about the efficacy of this service were expressed and therefore it appears desirable to attempt a comparison of the cost which might be incurred in providing this service through a different system.

The Department of Social Welfare considers the scales paid by them to dentists in respect of treatment benefit as confidential between the Department, the Irish Dental Association and the dentists on their panel. It therefore was not possible to price the dental treatment rendered by public dental officers on the Department scale rates. Fees paid by the Northern Ireland General Health Services Board are however published. These are reputed to be approximately 10 per cent lower than the fees paid by the Department of Social Welfare. Utilising these rates, more strictly averages based on those rates, the notional cost of public dental services for children and adults has been calculated (see Table A6). This shows a notional cost of £316,000 for children's services compared to the actual expenditure of £342,000. This is a remarkably small difference considering that public dental officers in the State outside the large towns have to spend a significant proportion of their time travelling between different centres. For adults the estimated expenditure on dentures—£71,000—is virtually the same as the notional figure. The aggregate cost for adults is about one-sixth lower than the notional cost.

These quantitative comparisons must be viewed with great caution as they may well hide large differences in quality of service, which in respect of extractions and fillings may be fairly minor but in respect of examination and dentures could well be very great.

For adults (including expectant and nursing mothers) extractions and dentures appear to account for virtually the whole cost, a mere seven per cent of aggregate expenditure refers to conservative treatment. For children 46 per cent of expenditure relates to conservative treatment and another 23 per cent to examinations.

Appendix Table A6

Notional cost of public dental treatment of children and lower income groups in the Irish Republic at Northern Ireland General Dental Service Fee scales, 1967

	Children		Cost		Adults		Cost	
	Units 000's	Cost per Unit	£000's	%	Units 000's	Cost per Unit	£000's	%
Dental Examination	181.3	8s.	72.5	23	37.6	8s.	15.1	12
Extractions:								
Deciduous Teeth	151.0	7s.	52.8	17	—	—	—	—
Permanent Teeth	78.6	7s.	27.5	9	79.6	7s.	27.9	22
Fillings:								
Deciduous Teeth	12.7	13s.	8.3	3	—	—	—	—
Permanent Teeth	124.1	18s.	111.7	35	4.1	18s.	3.7	3
Scaling, Polishing, etc.	74.6	7s.	26.1	8	14.9	7s.	5.2	4
General Anaesthetic	16.8	14s.	11.8	4	2.0	14s.	1.4	1
Dentures:								
Full set	—	—	—	—	5.3	£11 10s.	61.0	47
Full upper or lower	—	—	—	—	1.7	£5 15s.	9.8	8
Partial	1.4	£4	5.6	2	1.3	£4	5.2	4
Total			316.3	100			129.3	100

SOURCE:

Dental Treatment Provided 1967—Summarised by the Department of Health from Local Health Authority Returns 1967. Northern Ireland scale fees (including patients' contributions) calculated from Ministry Returns, 1st Quarter 1968.

APPENDIX IV

CURRENT AND CAPITAL COST OF EMPLOYING DENTAL THERAPISTS

Current Cost

The cost of employing a qualified dental therapist can be estimated by making a number of assumptions. First, that the salary scale is $\text{£}800 \times \text{£}50(10) = \text{£}1,300$, at 1969 prices. The average salary would depend on the average length of service of these auxiliaries. For women, an average working life of nine years would thus give an average salary of $\text{£}1,025$ and for men an average working life of 30 years would give an average salary of about $\text{£}1,200$. Second, it is assumed that the dental therapist only undertakes work which at present is undertaken by a dental surgeon. This does not mean that he or she is able to do all the operations which a dental surgeon performs, but that he or she spends all the time replacing work otherwise done by a dentist rather than act as a receptionist or chairside assistant. Third, it is assumed that he or she works at the same speed as a dental surgeon in similar conditions.

On the basis of these three assumptions, the employment of a dental therapist would present an approximate saving of 60 per cent in salary costs, i.e. the productivity of a dental surgeon and dental therapist is assumed to be the same and their costs are therefore proportionate to their salaries. The other costs of dental treatment, excluding the salary of the dentist—rent, consumable stores, replacements, capital charges and salaries of chairside assistants—may be assumed to be the same irrespective of whether a dental surgeon or a dental therapist provides the treatment. If it is furthermore assumed that the total of those costs at present accounts for some 40 per cent of the aggregate cost of treatment in the school dental service, the employment of a dental therapist would reduce the cost of treatment by approximately one-third. On this basis the saving would be much the same irrespective of whether men or women dental therapists are employed.

In New Zealand, school dental nurses work on their own and decide which children have to be referred to a dentist for treatment. In the United Kingdom, dental auxiliaries may only give treatment after the patient has been examined by the dentist. The latter procedure is clearly more expensive and would somewhat reduce the estimated savings. In any case, prior examination by a dentist in Irish rural conditions would not be very practical.

Capital Cost

The cost to the community of employing a dental surgeon or dental therapist, whether in private practice or public service, is made up of two factors: the salary, pension contributions and other fringe benefits they receive, and the cost to public funds of their education and training. If all dental surgeons and dental therapists employed were either recruited from outside the State or had paid themselves the full cost of their education and training, then the second component in the cost of their employment would be nil. However, this for dentists certainly is not the case. Furthermore, as was shown in Appendix I, well over half the dentists educated at considerable public expense leave after qualification to work permanently abroad.

The cost of training dental therapists is estimated on the conservative assumption that the quality of the teaching they receive and the quality of the equipment they use are identical to that of dental undergraduates. Dental therapists, according to the WHO Expert Committee, would spend the equivalent of three terms full-time in clinical training, while dental undergraduates spend seven terms in such training. On this basis, the clinical training cost of the therapist would be about 40-45 per cent of that of an undergraduate.

A dental therapist would in addition to clinical training have one year academic instruction compared to three years received by the dental undergraduate. The cost of academic training would thus be about one-third of that of an undergraduate. Allowing for the greater expense of clinical than academic instruction, the cost of training of a dental therapist would be approximately 40 per cent of the cost of producing a dental surgeon.

If the average working life in Ireland of a dental therapist was the same as that of a dental surgeon, then the second cost component of employment (the cost of training to public funds) would be proportionate to the cost of training them. The average working life of dental therapists will depend partly on the proportion of women who never marry and partly on the average age of those who do marry. It would also be influenced for both men and women by whether international recognition was given to the dental therapist diploma.

Even on the pessimistic assumption that the average working life of a dentist, allowing for emigration, is 20 years and that of a dental therapist 10 years, the capital cost of training a therapist per year of working life would still be less by some 20 per cent than the corresponding cost for a dentist.

The above estimates of current and capital cost of employing dental therapists are very similar to those made by Professor W. D. McHugh in 1966, in the *British Dental Journal* (November 1st 1966).

He refers to the local authority service in Britain and writes:

'The main advantages of auxiliary workers of this type (dental therapists) are that they can be trained more quickly and employed more economically than dentists. The difference in cost is not as great as might be imagined, however, for certain overhead expenses are common to both. From these estimates it would appear that the cost to the community of employing a dental auxiliary is approximately two-thirds that of employing a dentist.'

The New Zealand Health Department has estimated that the annual (current) cost of its dental service is approximately one-half that of an equivalent scheme staffed by graduates.¹ On the basis of the available evidence it might therefore be concluded that in Ireland the cost of employing dental auxiliaries would at most be two-thirds and might possibly be as little as one-half of the cost of employing dental surgeons.

Reference should be made also to three other relevant factors. In the public dental service the difficulties of recruitment are greater in rural than in urban areas. This is by no means a problem peculiar to Ireland. The Australian Report on Dental Auxiliary Personnel comments: 'Girls are temperamentally well suited to the constant handling of young children—further, single women are more willing to accept country positions than are (married) men. In New Zealand the School Dental Nurse is regarded as a prestige career for girls and applications are far in excess of the positions available.' Social conditions in Ireland may well be quite different to those in New Zealand. However, to recruit dental therapists with the particular object of their working in these areas would thus be desirable. From many points of view, there are clear advantages in undergraduates and dental therapy students receiving their clinical training together. However, men and women who were trained as dental therapists in the west of Ireland, say Galway, Castlebar or even Limerick would almost certainly be more willing to work in

¹ G1.

western counties than students who had become Dublin orientated during their training.

Second, the cost of clinical training for undergraduates will in future be much greater on account of the high capital cost in building the new dental hospitals. It might be possible in the training of dental therapists to economise by utilising the present dental hospital either in Dublin or Cork which will become redundant once the new hospitals are occupied. Such a policy unfortunately could not be reconciled with the advantages outlined in the previous paragraph.

Third, for a variety of reasons not all the places in the Dublin Dental Hospital will be taken up over the next few years. (See Table 6.) This might offer an excellent and inexpensive opportunity of starting an experimental, small scale course for dental therapists. The students would have to receive their academic training at a technical college and might possibly be able to attend some of the same courses which are provided for student ophthalmic opticians or student medical laboratory technicians.

Dental Hygienist

The current cost of a dental hygienist would not be much less than that of employing a dental therapist, assuming that he or she would be paid the same salary as a staff nurse, on a scale rising from £700 by 12 increments to £1,055. The average salary on an assumed working life of 10 years would be about £850. The length of training of a hygienist is recommended by the WHO Expert Committee to be a minimum of one year and in Britain must be at least nine months. At most the cost of this training would be 15 per cent of that of a dentist. For that type of auxiliary there would be no need to have the same quality of training as that given to a therapist. It may be thought desirable to combine the training of a dental hygienist with that of a chairside assistant to provide for greater versatility in the organisation of a practice.

APPENDIX V

GLOSSARY

Caries	decay of teeth
Conservative	treatment aimed at preserving teeth
Edentulous	toothless
Orthodontic	correction of irregularities in teeth
Periodontal disease	an insidious process which attacks the tissues supporting the teeth
Prophylaxis	preventive treatment of disease
Prosthesis	making up of deficiencies (e.g. by false teeth)
Dental Ancillary*	a generic term covering dental technicians, dental surgery assistants, dental hygienists and dental auxiliaries
Dental Auxiliary*	a class of ancillary as defined on page 29, paragraph 2.

*Note—The nomenclature of various classes of dental personnel presents certain difficulties. The terminology followed in this paper is the same as that in the Report of the Ancillary Personnel Committee of the British Dental Association, May 1968. (D.2). In the World Health Organisation Technical Report Series No. 385, it is stated that "the term auxiliary worker is used by the United Nations family of organisations to designate a paid worker in a particular technical field with less than full professional qualifications in that field who assists and is supervised by a professional worker".

At the W.H.O. Inter-regional Seminar on the Training and Utilization of Dental Personnel in Developing Countries in New Delhi in 1967, the problem of nomenclature was discussed and in the second consolidated report (an unofficial document) the finding was recorded that "due to the multiplicity of names used for and duties assigned to dental personnel from country to country (and sometimes within the same country) it was decided to define broad categories within general titles and to recommend a range of duties and responsibilities for each category". Three such categories were identified:

- Category I: Professional**
Definition: A graduate of a University or dental college who is registered to practise dentistry independently.
- Category II: Operating Auxiliary.**
Definition: A person who, not being a professional, is permitted to carry out certain procedures in the mouth under the direction and supervision of a professional.
- Category III: Non-operating Auxiliary.**
Definition:
- (a) Clinical
A person who assists the professional in his clinical work but does not carry out any independent procedures in the oral cavity.
 - (b) Laboratory
A person who assists the professional by carrying out certain technical laboratory procedures.

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