NATIONAL VARIATIONS IN SIGHT **TEST PATTERNS**

HERE ALWAYS appears to have been controversy over whether or not there are adequate numbers of OOs and OMPs for today's needs, let alone whether recruitment is sufficient for the future. One can look at the 14 strength of the optometry profession in 🚪 terms of 'full-time equivalents' by examining the hours worked and the number of tests carried out. One can also ask optometrists what they themselves feel and investigate the t regional variation in the provision of practitioners. It is these latter objectives to which this article addresses itself. Surprisingly little attention appears to have been given to the variations in the opinions of OOs or regional variations in sight test frequency within the United Kingdom.

Annual GOS sight tests

The number of optometrists registered with the General Optical Council varies during the year. Although the total at the end of 1985 was 6,331 and the end of 1986 was 6,375, it was only 6,176 at the time of the mid-1986 GOC survey (1985 FPC total was 6,129). If we weight the responses of the 2,070 who returned their optometrists questionnaires so that their age and sex matches the distribution published by the GOC and adjust the responses to allow for rounding bias we obtain Figure 1 which estimates the number of sight tests carried out by optometrists. This suggests that approximately 400 Registered OOs do no General Ophthalmic Service sight tests in a year and 220 indicates a distribution of annual tests with a median of 1,850 for active OOs. 988 Ophthalmic Approximately Medical Practitioners appear on FPC lists. A questionnaire was sent to all of

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Figure 1—Distribution of number of GOS sight tests carried out by optometrists in the period July 1 1985 to June 301986. Population estimates have been adjusted to allow for rounding errors and are based upon a sample of 2,070 responses which have been weighted to allow forage-related variation in response rates

these in mid-1986. Analysis of the 350 replies suggested there was no bias in the responses as totalling the number of annual sight tests and dividing by 35 per cent gave a total close to that attributed to OMPs by the DHSS. The distribution of annual GOS sight tests by OMPs is shown in Figure 2. As can no OMPs while at the other end of the be seen, the distribution is very skewed in comparison with that of OOs with large numbers of practitioners carrying are carried out by OMPs. Figure 3 out few tests. The mean and median number of tests carried out by active OMPs are 1,450 and 1,000 respectively.

Of the 11.9 million GOS sight tests carried out in the period in question (July 1985 to June 1986) 1.4 million were carried out by OMPs. The national average is thus 12 per cent, but OMPs are not distributed evenly about the UK. A number of FPCs and HBs have spectrum in the Borders HB of Scotland over 50 per cent of sight tests shows the variations in these proportions graphically for England, Wales and Northern Ireland counties,



Figure 2—Estimated distribution of number of GOS sight tests carried out by ophthalmic medical practitioners in the period July 1 1985 to June 30 1986 based upon a sample of 350 OMPs

Scotland regions, and Greater London FPCs.

Sight tests per list practitioner

Optometrists and ophthalmic medical practitioners often appear on more than one list of a Family Practitioner Committee (England and Wales) or Health Board (Scotland and Northern Ireland). Thus, for example, the number of OOs on a single FPC list does not represent the number of full-time optometrists—the major commitment of a practitioner may well be elsewhere in another FPC's area. There are even two or three OMPs whose names seem to appear on ten or more lists. On average, OOs and OMPs appear on 1.6 lists each.

FPC lists for 1986 were obtained by writing to every FPC in England and Wales, the Scottish Home and Health Department, and the Central Service, Agency in Belfast. Unfortunately, at the time of the analysis, sight test and population data were not available for 1986 but this was not felt to be a serious shortcoming. Some FPCs kindly supplied the number of registered patients for their area but not all were able to and one was obliged to fall back on resident populations. Estimated population statistics for these FPCs in mid-1985 were obtained from the Office of Population Censuses and Surveys in London, and General Register Offices for Scotland and Northern Ireland. FPC sight test numbers for 1985 were obtained from the DHSS in London, Scottish Health Service Common Service Agency in Edinburgh and Central Service Agency in Belfast.

If we divide the number of annual GOS sight tests in an FPC/HB area by the number of practitioners (OOs and OMPs) on the local list we obtain a figure which varies from just over 500 to more than 2,300 tests per FPC list practitioner. If we multiply by 1.6 this might be thought to give us a direct measure of practitioner's workload, and some FPCs report these statistics for their own area. If we look at the number of list practitioners per 100,000 population among FPCs we find that there is a negative association with



Figure 3—Proportions of GOS sight tests carried out by OMPs for counties and regions, and FPCs within Greater London. Data for this and all practitioner test estimates are based upon one and two per cent samples and are not precise. Data for Cornwall and the Isles of Scilly were merged, as were the data for the Western Isles, Shetland and Orkney. Separate data were not available for the Northern Ireland counties and the average for all six counties has been calculated

tests per list practitioner which would be expected. In other words, the more practitioners in an area the fewer tests they each appear to carry out. This is shown by the crescent-shaped scatter of 100,000 population region of the graph points in Figure 4. There are seven GOG



constituencies

Figure 4—GOS sight tests per list practitioner per annum against practitioners per 100,000 population for Health Boards and Family Practitioner Committees. There are four Northern Ireland and 15 Scotland HBs, and eight Wales, 18 Metropolitan, 20 Midland, 35 Northern and 17 Southern FPCs. The seven areas are the current constituencies of the General Optical Council (see caption for Table 3 for full description). Practitioners include OOs and OMPs

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while the opposite is true of the Metropolitan England FPCs. The four Northern Ireland Health Boards are clustered together around the nine practitioners per 100,000 mark. The most extreme value is provided by Kensington, Chelsea and Westminster FPC with over 70 practitioners per 100,000 population.

A similar picture is obtained if the data are averaged over counties (see Figure 5), although then the range of values for both 'tests per list practitioner' and 'practitioners per 100,000 population' is substantially reduced.

The national variation in the provision of OOs and OMPs on a county basis is illustrated further in Figure 6. This shows clearly the high density in the South, particularly in Greater London (33 per 100,000), Hertfordshire (27) and Surrey (27) but also in Greater Manchester (26) and the West Midlands (27). There appears to be substantial variation in the provision of practitioners, although this would normally be disguised by the annual GOC breakdown which only looks at the four countries.

The data may also be averaged across Regional Health Authorities (see Table 1). On this basis, North West Thames RHA comes out highest at 33 practitioners per 100,000 with North East



Figures—GOS sight tests per list practitioner per annum against practitioners per 100,000 population for counties and regions. These include Northern Ireland, the 10 Scottish regions, and eight Wales, three Metropolitan, 14 Midland, 12 Northern and 17 Southern counties. The seven areas are the current constituencies of the General Optical Council (see caption for Table 3 for full description). Data tot Cornwall and the Isles of Scilly were merged, as were the data for the Western Isles, Shetland and Orkney. Separate data were riot available for the Northern Ireland counties and the average for all six counties is presented. Practitioners include OOs and OMPs

Thames and Surrey not far behind.

Unfortunately FPC/HB data with regard to practitioner numbers are flawed. It is not just that one must multiply these on average by 1.6 to get a reasonable estimate of tests per practitioner. The '1.6' is a national average and the actual factor may be expected to be different for each FPC and HB. It may be unsafe to compare England and Wales FPC practitioner numbers with those for Scotland HBs or those for Northern Ireland HBs as the data come from different sources. Table 2 shows clearly that the large variation in provision of FPC/HB list optometrists between countries is not reflected in similar variations in the number of GOC optometrists. It may be safer to examine such variations within England and Wales, within Scotland, and within Northern Ireland as one would expect the data to be treated similarly, but even then caution is urged. Variation in population density and FPC size may influence the extent to which practitioners appear on more than one list. Also, not all FPC lists are as accurate and up to date as one would like them to be. Thus, one should take continued on page 31

Table 1

List practitioner density	and workload by	y RHA for 1985
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	sight tests per list practitioner per annum	list OMPs 8 OOs per 100,000 population	
REGIONAL HEALTH AUTHORITY			
Northern RHA	1210	16	
Yorkshire RHA	1190	17	
Trent RHA	1230	17	
East Anglian RHA	1400	15	
North West Thames RHA	750	33	
North East Thames RHA	910	26	
South East Thames RHA	960	22	
Surrey RHA	790	27	
Wessex RHA	1030	22	
Oxford RHA	1080	20	
South Western RHA	1320	18	
West Midlands RHA	960	23	
Mersev RHA	930	21	
North Western RHA	900	23	
Wales	1080	20	
Northern Ireland	1590	9	
Scotland	1180	15	
Scotland, Northern Ireland,	1020	21	

On average, an FPC practitioner (OO and OMP) in 1985 appeared on 1.6 lists. There are likely to be significant variations in different areas within countries and between countries with less tendencies for OOs to appear on more than one list in some. Comparisons between Scotland, Northern Ireland, and England and Wales are particularly suspect.

Table 2

Ontometrists	per 100 000	nonulation	in the UK
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	FPC list practitioners	FPC list optometrists	GOC optometrists			
COUNTRY						
Northern Ireland	9	8	11			
Scotland	15	13	11			
Wales	20	17	13			
England	22	18	11			
Scotland, Northern Ireland, England						
and Wales	21.	17	11			

On average, an FPC practitioner (OO and OMP) in 1985 appeared on 1.6 lists. Thus, for the UK as a whole, the 'list practitioner' referred to here is equivalent to 61 per cent of an FPC practitioner. If duplicate names are eliminated for the whole list, the number of FPC practitioners per 100,000 changes from 21 to 13.



Figure 6—Average number of practitioners on FPC/HB lists per 100,000 people for counties and regions, and FPCs within Greater London (see caption to Figure 3 for further details)

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the data where they apply to practitioner density more as hypothesis than proven fact.

An imperfect but useful external check on 'sight tests per list practitioner' is provided by the survey optometrists. Unfortunately, of detailed geographical locations of OOs were not solicited. This might have endangered anonymity in some cases and would certainly have further complicated the questionnaire. Instead, respondents were requested to indicate in which GOG constituency they mainly practiced. A comparison of the sight tests per FPC list-practitioner and per GOC practitioner is shown in Table 3. This confirms the somewhat anomalous nature of the Northern Ireland statistics-possibly due to its isolation and the tendency of OOs to be listed on only one of the four Health Boards (an average of 1.1 Northern Ireland HB lists per practitioner). Although it has the highest number of sight tests per list practitioner, it has one of the lowest figures for sight tests per GOC practitioner.

Despite this difference, the questionnaire does lend support to the idea that fewer tests are carried out by optometrists in the Metropolitan area.

Although the average at around 1,700 per annum is not as low as the FPC statistics would have suggested, it is still the lowest of all seven constituencies.

For the United Kingdom as a whole we have an average of 21 FPC practitioners (OOs and OMPs) per 100,000 people on each FPC list. Eliminating

duplicate names this gives us 13 FPC practitioners per 100,000 population and 11 FPC optometrists per 100,000. There are 11 GOC optometrists per 100,000 and an estimated 10 active optometrists per 100,000. The 1982 Office of Fair Trading report 'Opticians and Competition' made it particularly clear that international comparisons are dangerous as the United Kingdom has relatively few ophthalmologists, and in some countries only ophthalmologists test sight. Even in the United States, 43 per cent of sight tests were carried out by ophthalmologists in 1975. There has recently been a call to decrease recruitment in the USA where growth of optometrists has begun to outpace that of the population, although the opposite opinion has also been expressed. Despite the differences between the two countries, it might be worth mentioning that the provision of active optometrists there varies between states from 6 to 16 per 100,000 with a national average of 10 (Peters, 1987). The American Optometric Association National Plan for New Academic Facilities and Programs for Optometric Education, 1985, established a target ratio of 12 per 100,000. In 1980 there were five ophthalmologists per 100,000 population 15 ODs and MDs per 100,000 (Davidson, 1987).

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Table 3	
Sight tests per GOC and FPC list practitioner by GOC	2
Constituency for 1985	

	sight tests per list practitioner per annum	sight tests per GOC practitioner per annum
GOC CONSTITUENCY		
Metropolitan	720	1699+/-34
Northern Ireland	1590*	1737 + / - 88
Scotland	1180*	1862+/-32
Northern England	1050	1958 + / - 28
Wales	1080	1964 + / - 67
Midland	1100	1995 + / - 31
Southern England	1170	2000+1-29

On average, an FPC practitioner (OO and OMP) in 1985 appeared on 1.6 lists. It was far less for Northern Ireland and close to 1.0 for Scotland. There are also likely to be significant variations within constituencies with less tendency for OOs to appear on more than one list in some, and this makes interpretation rather more difficult than it may first appear. The FPC list column gives the average number of sight tests for 11st OOs and list OMPs combined. The GOC column gives the mean and SE mean annual sight tests for active optometrists-excluding those carrving out zero tests.

The English GOC constituencies are made up of the following counties

Metropolitan: Greater London, Hertfordshire and Surrey; Midland: Cambridgeshire, Cheshire, Derbyshire, Hereford & Worcestershire, Leicestershire, Lincolnshire, Norfolk, Northamptonshire, Nottinghamshire, Shropshire, Staffordshire, Suffolk, Warwickshire, and West Midlands;

Warwickshire, and west midlands; Northern: Cleveland, Cumbria, Durham, Greater Manchester, Humberside, Lancashire, Merseyside, Northumberland, North Yorkshire, S. Yorkshire, Tyne& Wear and W. Yorkshire; Southern: Avon, Bedfordshire, Berkshire, Buckinghamshire, Cornwall, Devon, Dorset, East Sussex, Essex, Gloucestershire, Hampshire, Isle of Wight, Isles of Scilly, Kent, Oxfordshire, Somerset, West Sussex and Wiltshire

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Subjective view of manpower

In our survey, opticians were asked how they viewed the manpower situation. Threequarters felt there were about the right number of OOs, nine per cent felt there were too many and 16 per cent felt three were too few. Whilst this accurately represents the aggre gate view it disguises the fact that different groups of OOs hold differing opinions (see Table 4). Eighty per cent of respondents had not been responsible for the appointment of optometrists and the majority of this group were satisfied (79 per cent) with the status quo with the remainder being

Table 4

Attitude to manpower situation as a function of responsibility

Sector Provide and Provide State	view of manpower			sample
	'too tew OOs'	'about the right number'	'too many OOs'	size
RESPONSIBLE FOR STAFF APPOINTMENT?				
'No'	1190	79%	10%	1313
"Yes-temporary staff"	25%	64%	1196	64
'Yes-permanent and temporary'	36%	58%	6%	67
'Yes-permanent staff'	36%	5796	8%	207
all respondents	16%	75%	996	1651

Tables

Attitude to manpower situation as a function of recruiter's area

	view of manpower			sample
	'too few OOs'	'about the right number'	'too many OOs'	size
GOC CONSTITUEN	CY		Real of the	
Metropolitan	22%	74%	496	51
Northern Ireland	50%b	0%6	50%	6*
Scotland	19%	68%	13%	37
Northern England	32%	6396	5%	60
Wales	31%	62%	89/0	13*
Midland	32%	60%	8%	62
Southern England	46%	48%	6%	102
more than one area	53%	40%	7%	15*
all recruiters	34%	58%	8%	346

* Because these figures are very small, the corresponding percentages should be disregarded. When categories are merged and a legitimate Chi-squared test is carried out the result is a statistically significant difference between the regions ($\chi^2 = 17.2$, df = 7, p<0.05).

Table 6			
Attitude to manpowe	r situation as a f	unction of nor	h-recruiter's area

	view of manpower			sample
	'too few OOs'	'about the right number'	'too many OQs'	size
GOC CONSTITUEN	CY	1000		
Metropolitan	15%	76%	996	195
Northern Ireland	7%	64%	29%	28
Scotland	9%	79%	12%b	84
Northern England	9%	84%	7%	321
Wales	9%	7596	16%	63
Midland	8%	80%	1195	306
Southern England	14%	78%	8%	292
all non-recruiters	119%	7996	10%	1289

A Chi-squared test indicates a statistically significant difference between the regions ($X^2 = 28.0$, df 12.p < 0.01

regional variation.

population

Practitioners were also asked how difficult it was finding suitable optometrists. Here, the majority (over 60 per cent, see Table 7) found the

task 'difficult' or Very difficult' but

there was no evidence of any

Sight test frequency in

There is, of course, enormous variation

on a county basis in population density

in the UK-from less than 10 people per

square kilometre in some regions of

Scotland to 4,400 for Greater London

(see Figure 7). I understand that rural

practices are experiencing difficulty

and population density might be a small

almost equally divided between those feeling there were too few and those feeling there were too many OOs (one in 10 in each case).

Although the majority (almost 60 per cent) of those involved in recruitment were also happy with the present situation there was a substantial minority of one in three who felt there were too few OOs.

One might expect views to vary across the country and a statistical analysis confirmed this for both OOs (Table 5) recruiting and non-recruiters (Table 6).

Amongst the recruiters there was evidence that 00 workloads did relate to opinions on manpower. The FPC and questionnaire data had both indicated Table 7 fewer tests per practitioner in. the 'How difficult was it finding suitable practitioners?' Metropolitan area. Amongst recruiters this was one area where there was less tendency for them to feel there were too few OOs-2^ per cent compared with 34 per cent nationally. On the other hand, feelings were strong (46 per

cent) that there were too few OOs in Southern England and this was where sight tests per GOC practitioner were highest at 2,000 per annum.

When the views of non-recruiters are examined we find that Southern England is again an area where there is a greater tendency for practitioners to feel there are too few OOs-14 per cent as against 11 per cent nationally. But unexpectedly, we find also a tendency to feel there are too few OOs in Metropolitan England where tests per GOC practitioner is at its lowest. Almost 30 per cent of non-recruiters in Northern Ireland felt there were too many OOs but the numbers are too small for any real conclusions.

	view of recruiting					
	'very difficult'	'difficult'	'neither difficult nor easy'	'easy'	'very easy'	size
all recruiters	31%	32%	26%	7%	4%	375

factor.



Figure 7—Population density in 100s of people per square kilometre for counties and regions (see caption to Figure 3 for further details)

Figure 8 shows how 'sight tests per 100 population per annum' varies with population density for counties and regions in the UK. There is a suggestion, that the frequency of sight testing increases with the population density. Careful scrutiny of the scatter diagram reveals that this relationship is not always clear for individual GOG constituencies—particularly Southern England and Northern England, but it is interesting to note that the trend appears quite clear for Scottish regions and Welsh counties. Despite overlaps, it is also clear that test frequency varies with GOG constituency and is particularly low in Northern Ireland and some regions of Scotland (14 tests per 100 people per annum).





This regional variation is shown to best effect by Figure 9. This confirms the North-South variation in sight test frequency. It is clearly highest in the affluent South of England (23 per 100 for Metropolitan and Southern England, 26 for the counties of Avon and Devon) and lowest in Northern Ireland. The position in Northern Ireland may reflect lack of affluence or the fact that we are dealing with a different people or a strong control of sight testing by the Central Service Agency administrators or perhaps all three.

It appears clear that population density and location within the UK are both implicated in the variation in sight test frequency. Variations in age and sex distributions are also likely to be a factor with, for example, older people needing more vision care than younger. However, when the potential for sight continued on page 34



Figure 9—GOS sight tests per 100 population per annum for counties and regions, and FPCs within Greater London (see caption to Figure 3 for further details)

continued from page 33 testing is calculated for each FPC and HB taking age into account we find that the standard deviation of the potential sight tests per 100 population per annum is only two per cent with the difference between the 95 percentile and five percentile FPCs representing a seven per cent variation. Further, the weighted correlation between sight test potential and actual number of sight tests per 100 people is only 0.23.

Although we have earlier seen how increased numbers of practitioners leads to less work for each of them, there remains the possibility that it will at the same time stimulate the demand for sight tests. Figure 10 details the data for FPCs and HBs (excluding Kensington, Chelsea and Westminster FPC) and appears to show this relationship, but it is less apparent when the data are averaged across counties (see Figure 11).

One of the problems of the sight test frequency statistic is that people do not necessarily have their sight tested in the area within which they live. Opticians with premises near to the border of an area (county, region, FPC, HB, GOG constituency or RHA) would, of course draw patients from the neighbouring area. With FPCs which cover a small area and which have a high population density the problem may well be exaggerated.

This is made clear by Figure 12 which looks at Greater London. The anomalous position of Kensington, Chelsea and Westminster FPC has already been mentioned. It has a sight test fre-

quency of around 50 sight tests per annum per 100 people presumably due to people coming into the area, while the figure for Haringey and Enfield is only 18. In Lambeth, Southwark and Lewisham sight tests per FPC 00 per annum are around 500, while in Barking and Havering they are close to 1,300. Kensington, Chelsea and Westminster has 74 practitioners per Canden and Islington 45, while Barking and Havering ¹ proportion of OMPs amongst practitioners also varies greatly from 10 per cent for Camden and Islington, and City and East London to 32 per cent for Bromley and 38 per cent for Hillingdon. Of course, Greater London is a special case and the variations within it are a strong reason for treating the data for London as a whole when one wants to consider the people who live there. But the variations do illustrate well the problems in any analysis of FPC data. It may be that the tendency for sight test frequency to increase with population density on a county basis may in a small part be due to movement towards centres of population.

Conclusions

1 Optometrists' attitudes to manpower depend upon whether or not they are



Figure 10—GOS sight tests per 100 population per annum against practitioners per 100,000 population for FPCs and HBs (see caption to Figure 4 for more details). Data for Kensington, Chelsea and Westminster FPC (48 tests per 100 people and 74 practitioners per 100,000 people) have been omitted to permit an enlarged scale for the remaining data





involved in recruitment and amongst recruiters appear to reflect the relative workload of OOs.

2 There appears to be a North-South division in the frequency of sight testing with 14 tests per 100 population per annum in Northern Ireland and parts of Scotland rising to 23 for Metropolitan and Southern England. 3 Some areas of the United Kingdom have more OOs and OMPs per head of population than others, although the precise pattern of variation is unclear due to uncertainties in FPC data. On average, -the greater the number of practitioners the fewer tests they carry out.

4 Although differences between the major geographical areas are in part uncertain, it is clear that the average optometrist in the Metropolitan area does fewer tests per annum than his colleagues elsewhere.

5 There is a small tendency for the number of practitioners per head of population to correlate with the number of sight tests per head of population. This may or may not represent cause and effect.

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Figure 12—Average number of GOS sight tests per FPC list optometrist for Greater London FPCs. Some of the extremes for the London area follow. List-optometrist work load: Barking and Havering —1,300 tests per list-optometrist per annum; Lambeth, Southwark and Lewisham—500. Sight test frequency: Haringey and En field—18 tests per 100 population; Kensington, Chelsea and Westminster—48. Proportion of OMPs amongst practitioners: Camden and Islington—10 per cent; City and East London—10, Bromley—32 and Hillington—38. Practitioners per 10,000 people: Barking and Havering—18; Barnet—45; Camden and Islington—45: and Kensington, Chelsea and Westminster—74