FUTURE SIGHT TEST WORKLOADS

IF WE assume an underlying exponential (constant percentage) growth in the number of United Kingdom General Ophthalmic Service sight tests between 1965 and 1985 then we obtain an average annual increase of 2.6 per cent (Table 1). However, the curve is far from a good fit and in the last five years the increase has consistently exceeded this value (Figure 1). Future changes remain difficult to forecast. The last two years have seen a decline in the increase, and it may be that we are approaching a period when rises will be less than two and a half per cent per annum. The fitting of curves to sight test data is a mathematical procedure which provides little insight into the process concerned. All that can really be said is that at present an exponential curve provides a better fit than a straight line. If one ignores the data on testing in the intervening period and just looks at the figures for 1966 and 1985 then one obtains a higher figure—an annual average increase of 2.9 per cent per annum.

In this article we are only concerned with sight tests carried out by optometrists, but when considering trends in national demand it would appear sensible to first consider the whole as already described. In 1986 an estimated 12.4 million sight tests were carried out of which 1.4 million were by ophthalmic medical practitioners. There appears to have been little change in the number of OMPs on FPC lists or the number of sight tests they carry out. Since 1972, an apportionment by the DHSS suggests that an average of 972 OMPs (standard deviation 5) carried out 1.42 million tests per year (standard deviation 34,000) with little sign of a trend (see Figure 1). Thus, virtually all growth appears to have been contributed by optometrists. If we look at sight tests by OOs alone, the average annual growth between 1966 and 1985 rises to 3.0 or 3.2 per cent (see Table 1).

In contrast, during the first half of the 80s the strength of the Register has grown at a more modest one per cent per annum (French, 1987g). Consequently, the optometric sight test load per FTE 00 has risen by an annual four per cent per annum between 1980 and 1985-from 37 to 45 tests per FTE optometrist per week. The increase in Register strength looks likely to be around one and a half per cent per annum in the second half of the 80s. The increase in sight test workload for this period will depend upon the extent to which the Register strength rise is exceeded by the annual increase in national sight tests. Thus, workload is likely to have increased by around three per cent in 1986.

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Table 1: Annual changes in UK GOS sight test totals

	by OOs	by OMPs	total
1966	1.7%	1.7%	1.7%
1967	3.8%	3.5%	3.7%
1968	2.9%	1.9%	2.7%
1969	1.0%	2.6%	1.2%
1970	1.3%	−1.5%	.8%
1971	1.2%	.3%	1.1%
1972	−.9%	6.3%	.4%
1973	6.2%	3.4%	5.7%
1974	4.3%	−4.4%	2.7%
1975	5.1%	4.6%	5.0%
1976	4.7%	1.4%	4.2%
1977	−3.8%	−5.2%	−4.1%
1978	6.7%	−1.1%	5.4%
1979	3.8%	2.0%	3.5%
1980	2.9%	−1.4%	2.3%
1981	2.1%	−2.3%	1.5%
1982	2.5%	4.7%	2.8%
1983	5.9%	−3.1%	4.5%
1984	7.9%	4.6%	7.5%
1985	6.2%	.1%	5.4%
1986	4.4%	−3.6%	3.4%
1965-85	3.0%		2.6%
	(3.2%)		(2.9%)

Positive values are increases and negative values decreases. The figures for 1986 are estimated—based upon incomplete UK data. The main 1965-85 values are the constant percentage increases for the best-fit exponential curves. The figures in parentheses represent the simple annual increase between 1965 and 1985 ignoring intervening years. These are higher than the best-fit figures because of the imperfect nature of the constant growth curve with more rapid rises in recent years. The apportionment of 00 and OMP sight test numbers is currently based upon two per cent samples. Since 1972 there has been little sign of any increases in testing by OMPs. Table from French (1987e).

As here, previous studies have sometimes attempted to fit a curve to national data. Occasionally, the simpler approach has been taken—looking just at the figures for the start and finish of a period. A further procedure adopted by Alpine and Jack (1979) was to look at the trends in moving averages for three, four and five year periods. This does not exhaust the possibilities. All approaches provide slightly different results. In 1970 Alpine observed that the demand for ophthalmic optician's services was increasing at around two per cent per annum of which half a per cent was accounted for by population growth. In 1974 the Economist Intelligence Unit projected a growth rate of 2.1 per cent per annum and suggested that possible future demand by 1983 might be 15.7 million, although they added that such a target was not practical with the then structure of the profession. In 1977 Bennett reported the rate of increase was around 2.4 per cent per annum with a smaller contribution from population growth. Alpine and Jack (1978) suggested that the long-term average of 2.9 per cent per annum represented the most probable future trend with alternative assumptions of five and two per cent per annum. Bennett (1978) considered that exponential growth could not persist indefinitely. He thought continued five per cent growth quite unrealistic and even expressed some doubts about the consequences of Alpine and Jack's 2.9 per cent—9.5 million by 1984 and 11 million by 1989. Hardy (1978) had suggested that a total of 8.2 million by 1984 would be nearer the mark based upon three-yearly tests for 25 million spectacle wearers. One year later Alpine and Jack (1979) had revised their median demand growth figure down from 2.9 to 2.6 per cent per annum.

It could be argued that the question is not so much how big the annual increase is likely to be as to for how many more years are we likely to see increases? How long will it be before a ceiling is reached? The current level of sight tests is around 80 per cent of the Fill's 1974 estimation of potential future demand.

Thus, it might be best to first look at

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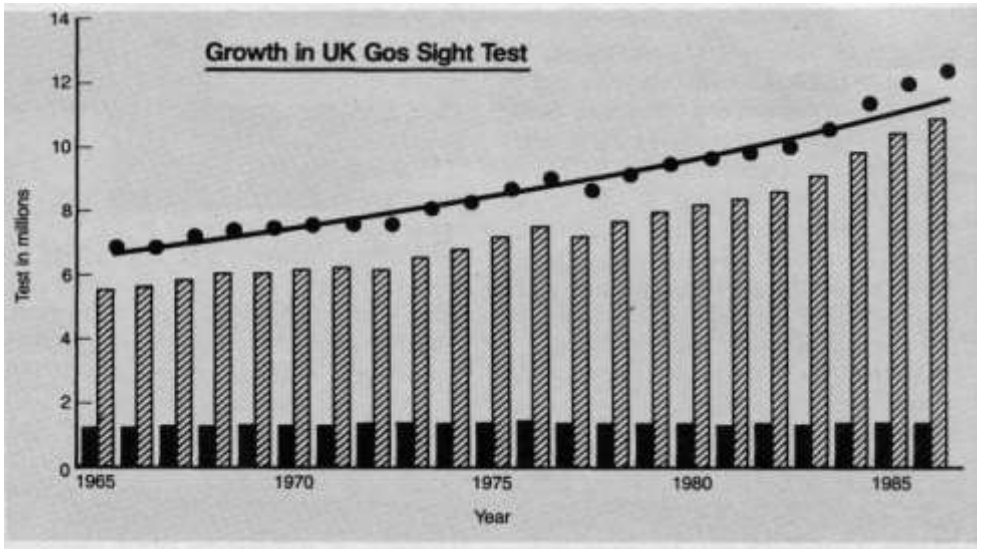

Figure 1: *The bars indicate the number of GOS sight tests estimated to be carried out by OOs and OMPs in Great Britain and Northern Ireland each year. The crosses indicate the combined total and the curve is the best-fit, constant percentage growth (2.6 per cent per annum) curve.*

the UK potentials for sight testing rather than rate of growth. If a demand ceiling is close then demand growth will be expected to slow. The 1986 Optometry Manpower and the Need for Vision Care surveys looked at the ideal levels of sight testing (French, 1987b) and the results obtained in conjunction with Register growth enable one to suggest future levels of testing. Some of the ideal levels can be called into question but even if accepted it is unlikely that any ideal will ever be met. As Barresi (1987) has observed, need methodology is prone to overestimate realised demand for health services and this must be allowed for.

The procedure adopted here is to assume that demand growth in the form of an increase in sight test numbers will continue along the best-fit, 2.6 per cent per annum, path on its approach to one of the saturation need levels suggested, and that the number of tests carried out by OMPs will remain unchanged. French and Loran (1983b) assumed that population growth (at 0.2 per cent per annum) would continue after the year 2000 and contribute in a small way towards an increase in demand. Even this small increase is now in doubt. The 1985-based OPCS projections for England and Wales (OPCS, 1986) tentatively indicate a rate of population increase which averages out at only 0.1 per cent a year over the first quarter of the next century. Within this, people of pensionable age are projected to increase in number at the rapid rate of one per cent a year. The elderly require more eye care than the rest of the population, but like the very young they will remain minorities and the implications may not be as great as they may first appear. Still, they are an important sector of the community.

Recruitment to the GOG Register is assumed to continue at 265 per annum (60 per cent women and seven per cent overseas) with Register loss rates of those of 1981 to 1985 as discussed in French (1987f).

None of this takes into account changes in technology and economics which are likely to bring their own pressures (see, for example, Harding, 1984; Pickwell, 1986).

Sight testing levels already vary substantially within the UK (French and French-Teeling, 1987) from 26 per 100 people per year in the counties of Avon and Devon to 14 in Northern Ireland and parts of Scotland. The former is almost equivalent to a UK total of 15 million per year, a little less than the rate of testing highlighted by the 1974 EIU report. If 15 million was the national demand ceiling then one would expect this to be reached by the turn of the century. The consequence would then be a long slow decline in the test load per Full Time Equivalent optometrist (see Figure 2).

The 1986 surveys revealed several possible demand ceilings in the form of 'ideal' testing rates. OMP middle opinion suggested 27 million sight tests

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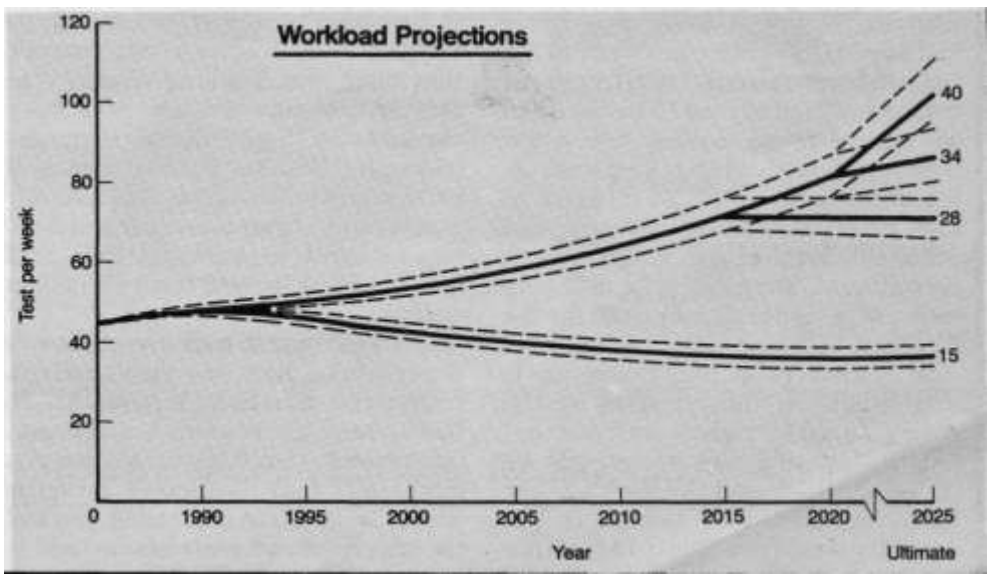

Figure 2: *The graph indicates future workloads in terms of GOS sight tests per FTE optometrist per week. 'Ultimate' indicates the levels expected when the Register reaches its ultimate or steady-state strength. The graph has four branches. These correspond to the consequences of sight test growth following the 2.6 per cent per annum curve until it reaches alternative national demand ceilings of (i) 15 million, (ii) 28 million, (iii) 34 million and (iv) 40 million—see labels. The solid lines reflect the middle assumptions of French (1987a) including an annual Register intake of 265 (60 per cent women and 7 per cent overseas), while the dashed lines assumed alternative intakes of 250 (65 per cent women) and 280 (55 per cent women).*

per annum (48 per 100 people), a little below 28 million which is equivalent to testing everyone every two years. OMP modal opinion favoured 34 million tests per annum. Optometrists favoured more frequent testing of 39 or 40 million tests per annum depending upon the choice of central tendency statistic. If growth in national sight tests were to continue at 2.6 per cent per annum to the 28, 34 and 40 million ceilings then the average sight test load would increase along the paths indicated in Figure 2.

At present growth is above the best-fit curve and at such times one would expect the workloads to be higher than Figure 2 suggests. But as any ceiling is approached one would expect growth to slow and this would suggest workloads lower than these curves with maximums reached a little later than the diagram suggests. A ceiling of 28 million would be reached in 2022 or later giving a peak workload of 71 sight tests per FTE optometrists; 34 million by 2028—an ultimate workload of 86; and 40 million by 2034—an ultimate workload of 102.

Figure 2 also indicates (dotted lines) the consequences of Register recruitments of 250 (65 per cent women) and 280 (55 per cent women).

Thus, it should be clear that the future sight test loads of optometrists are inextricably bound up with the question of demand ceiling. Between 1969 and 1986 the average sight test load per FTE 00 per week has increased from 27 to 46 (French, 1987c and 1987d)—growth equivalent to 3.2 per cent per annum. But if national demand will not exceed 15 million then we appear to be looking towards a period of reduction in working load. On the other hand, if 40, 34 or even 28 million represents a realistic and attainable level of need then present recruitment suggests a continuing increase in sight test workload for the foreseeable future.

Of course, even if a consensus is established on the question of the national need for sight tests it does not follow that this will necessarily be reflected by demand. At one stage the BDA suggested that demand in UK dentistry would rise to just 75 to 80 per cent of the perceived need by 2018. This was widely criticised as being too optimistic, although the BDA in their 1986 discussion paper saw no reason to substantially alter it.

It should be restated that GOS sight tests are not the be-all and end-all of optometry and there is a danger in projecting future sight test loads to assume there is nothing else, and not allow for contact lens practice, continuing education, dispensing and so on. There is a further danger that it will be assumed that the sight test will remain unchanged and the optometrist's role static. Obviously, there will be technological advances and other changes which it may be difficult to anticipate. And changes following on political developments will influence the extent to which any health care need is translated into demand from the general public.

Postscript

Since the GOG report and this article were written, the government has produced its White Paper 'Promoting Better Health Care', and the 'Health and Medicines Bill' abolishing sight test fees has had two readings in the House of Commons. The GOS sight test is to be replaced by a 'standard sight test' (as yet undefined) or 'a fuller examination to meet … patients' needs and preferences'.

If the consequences of this legislation are that the general public will in future be paying for their sight tests or eye examinations then it has been suggested that fewer people will be seeking them. In other words it may be that the demand ceiling discussed in this article may already have been reached with 15 million tests per annum (yet alone the other figures discussed) being out of reach. If this is so then one would expect to see an earlier and more rapid decline in workload than that indicated in Figure 2 for a 15 million ceiling.

One's attitude to such a scenario will depend upon how one views today's manpower situation. If you believe there are at present insufficient optometrists then it is possible that you might feel that no further action is called for. If, on the other hand, you feel the supply of optometrists in 1987 is adequate then it may follow that you feel there should be an early cut in the number of recruits to optometry departments. It is interesting to note that recent advertisements by Aston University reveal that in the last five or six years they have increased their intake by around 60 to 80 per cent per annum making them potentially the largest undergraduate school in the UK. It is possible that the UMIST intake may also increase after its move to new premises this year—from its present 40 to 48 per annum.

References

ALPINE R L W (1970), *An analysis of the structure of the UK ophthalmic optical professions*, report to the General Optical Council.

ALPINE R L W and JACK A B (1978a), The adequacy of present recruitment to the optical professions, OPTICIAN, 175, March 31, 17 (pp6).

ALPINE R L W and JACK A B (1978b), The adequacy of present recruitment to the optical professions-appendix, OPTICIAN, 175, April 14, 27 (pp5).

ALPINE R L W and JACK A B (1979), The appropriateness of present recruitment rates to the optical professions-supplementary report, *The Ophthalmic Optician*, 19, 93-935.

BARRESI (1987), Technology and delivery issues: Impact on personnel resources in optometry, *Journal of Optometric Education*, 12,109-113.

BENNETT A G (1977), Student intake in the ophthalmic optical profession, *The Ophthalmic Optician*, 17, 79-84.

BENNETT A G (1978), Some comments on the Alpine-Jack report on professional manpower, *The Ophthalmic Optician*, 18, 679-684.

British Dental Association Council (1986), Manpower Subcommittee Second Report, (Chairman D G Lloyd), BDA.

Economist Intelligence Unit (1974), Ophthalmic Opticians—Manpower Analysis, report to the Society of Opticians.

FRENCH C N (1987a), Optometry manpower and the need vision care, report to the GOC.

FRENCH C N (1987b), The average interval of time between GOS sight tests, *Optometry Today*, July 41987, 27, 49 (pp5).

FRENCH C N (1987c), The current strength of the optometry profession: background and survey technique, OPTICIAN, in press.

FRENCH C N (1987d), The current strength of the optometry profession: the influence of age and sex, OPTICIAN, in press.

FRENCH C N (1987e), Ideal average times for sight tests, *Optometry Today*, in press.

FRENCH C N (1987f), Working lives of optometrists, *Optometry Today*, in press.

FRENCH C N (1987g), Growth in Register Strength and Numbers, OPTICIAN, in press.

FRENCH C N and FRENCH-TEELING S (1987), National variations in sight test patterns, OPTICIAN, June 19 1987,193, 24 (pp8).

FRENCH C N and LORAN D F C (1983), Optometry manpower up to the year 2000 and beyond—Part 2: The future, *The Ophthalmic Optician*, 23, 449 (pp7).

HARDING G (1984), Securing the future for ophthalmic optics, OPTICIAN, 188, November 2, 23 (pp3).

HARDY W E (1978), Factors and implications of a GOC report, *The Ophthalmic Optician*, 18, 243-244.

Office of Population Censuses and Surveys (1986), Population projections: mid 1985-based, OPCS Monitor, ReferencePP286/1.

PICKWELL D (1986), Optometry in Britain needs a policy, OPTICIAN, 192, 28-29.