

The Ophthalmic Service



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Cover

Part of a fresco on a church wall near Venice. Oldest known picture of a person wearing spectacles, circa 1450. Print from Mary Evans Picture Library.

On a fourteenth century tombstone in a graveyard in Florence can be found the inscription, 'Here lies Salvino Armatto, the inventor of spectacles'. The inscription is probably inaccurate since both the Ancient Greeks and the Ancient Chinese were aware of the properties of crude forms of lenses in correcting visual defects. In medieval times, however, spectacles did first come into use around the beginning of the fourteenth century, during Armatto's lifetime. With the advent of printing and greater literacy in the population, the demand for spectacles increased. Spectacle making became a recognised craft and in Britain in 1629 Charles I granted a Royal Charter to the Worshipful Company of Spectacle Makers of London.

At this time spectacles were sold by pedlars, haberdashers and jewellers and the customer chose them by trial and error. It was not until the nineteenth century that the scientific basis for the measurement and correction of optical defects was laid. In 1864 Franz Cornelius Donders, 'the father of ophthalmic optics', published 'The Accommodation and Refraction of the Eye'. The development of the science of ophthalmic optics together with the development of such diagnostic instruments as the ophthalmoscope and the retinoscope, which came into common use during the early twentieth century, heralded the emergence of the sight-testing optician from the old craft of spectacle making. Today the ophthalmic optician in Britain is concerned with the examination of eyes and measurement of optical defects, and although he also dispenses spectacles in common with the dispensing optician, the actual manufacture of frames and lenses is out of his hands. This contrasts with the experience of continental countries, particularly France and Germany. There the optician has remained much more closely associated with the manufacture of spectacles. This paper is concerned with only one specialised part of eye care, that is, the provision of spectacles and associated services of the type available either under or through the General Ophthalmic Service. It does not deal specifically with the wide range of medical eye services available from hospitals, general practitioners and school clinics.

The development of the ophthalmic profession

During the late nineteenth and early twentieth centuries, it has been noted, the development of the science of ophthalmic optics encouraged the emergence of the sight-testing practitioner as distinct from the trader who merely sold whichever pair of spectacles his customer chose. However, up to the inception of the National Health Service, and indeed for some time afterwards, the high street spectacle seller and the optician with little, if any, expertise continued to exist. Much of the history of ophthalmic services in this country is associated with attempts by the ophthalmic optical profession to raise the standards of practitioners, to eliminate 'quacks' and to gain recognition of professional status for ophthalmic opticians as a whole. In 1896 the British Optical Association introduced the first examinations. These examinations were divided into various grades and foreshadowed the present distinction between the ophthalmic optician who is qualified both to test sight and dispense spectacles and the dispensing optician who is qualified solely to dispense. Before the first war and during the inter-war years, attempts were made to secure registration for opticians. The need for a list of competent opticians became increasingly evident after the first war when the Approved Societies began to make available optical benefits, in addition to the normal medical benefits, under the National Health Insurance Acts. In 1923, the register of the Joint Council of Qualified Opticians was instituted and most of the Approved Societies agreed to require their insured persons to obtain services only from practitioners on this register, or otherwise from medically qualified practitioners. However, in 1930 Government regulations were made which gave completely free choice of practitioner to insured persons. The effect of this was to enable insured persons to consult ill-qualified opticians if they desired.

At the inception of the National Health Service in 1948, therefore, there were very wide variations in qualifications and expertise, particularly among ophthalmic, or sight testing opticians. On the one hand there were full-time qualified opticians forming the majority of practitioners. On the other hand there were 'quack' opticians or high street traders who sold spectacles without any sort of sight test or prescription. In between there were chemist opticians, jeweller opticians and photographer opticians who combined their optical functions with other interests. In addition the public had for many years been able to receive sight tests and

prescriptions from medically qualified practitioners, who might also be employed as family or specialist hospital doctors.

In this confused situation, it had to be decided how the ophthalmic services were to be organised under the National Health Service. The decision taken was to place the sight testing side of ophthalmic services under the hospital service under the control of medically qualified ophthalmologists, while dispensing was to be performed both within and outside hospitals. However, it was recognised that the transition could not take place until facilities were available in hospitals, and as a stop-gap measure the *Supplementary Ophthalmic Service* was instituted within which ophthalmic medical practitioners and opticians could operate, as before, as independent units, although under contract to the Ministry of Health. Section 41 (4) of the National Health Service Act gave the Minister powers to wind up the Supplementary Service in any area where he was satisfied the hospital eye service could adequately meet demand. Section 41 (4), however, was never used and since the early years there has been little expansion in sight testing and dispensing services offered by hospitals. The supplementary service soon became permanent in fact if not in name.

In retrospect, the intention to bring the bulk of ophthalmic services under hospitals appears ill-considered. It was in fact one of the few structural changes in the health services envisaged by the National Health Service Act. Other major suppliers of goods and services under the National Health Service, chemists and dentists, were to continue to operate as before in independent units. The decision to aim towards a comprehensive hospital eye service may partly have reflected the view commonly held at the time that the hospital was to be the focal point of all medical services in the future. Furthermore there was the belief that eye care ought not to be separated between two distinct services, and in view of the wide variations in standards in the optical profession at the time, it was felt that all aspects of eye care ought to come under medical control. The implications of this policy, however, were probably not fully thought through. In the first place the transfer of 6,000 opticians and their equipment to hospitals would have been a mammoth task, and in terms of convenience an effective reduction in the number of sight testing and dispensing premises may not have been to the advantage of the patient. Furthermore, no provision was made in Section 41 (4) for compensation for loss of the optician's practice.

In the event, fears that opticians operating as independent contractors could not provide services of sufficiently high standard proved ill-founded, and it was soon recognised that the satisfactory operation of the supplementary service had invalidated the premises upon which the intended transference to the hospital service were

based. The trend towards improved standards among opticians continued along two lines. Educational courses necessary for qualification became longer and more comprehensive. With the recent elevation of technical colleges to university status, ophthalmic opticians now emerge from a three year course with a degree. In addition they must also complete a pre-registration year. The curriculum includes courses on the structure and physiological function of the eye which will help the ophthalmic optician to recognise or detect abnormal conditions of the eye which require treatment outside the scope of the ophthalmic service.

The second line of development since the inception of the National Health Service has been towards registration and the recognition of professional status for opticians. In 1952 the Crook Report was published, recommending the establishment of a General Optical Council similar to the General Medical and General Dental Councils, which would set up and maintain registers for ophthalmic and dispensing opticians and exercise governing and disciplinary powers over them. The Crook Committee Report was agreed as a basis for legislation, but it was not until 1958 that the Opticians Act set up the General Optical Council. The Opticians Act effectively gave opticians the independent professional status they had been seeking. Its provisions made it illegal for any person (other than a registered medical practitioner) not on the register of the General Optical Council to prescribe or dispense spectacles.

These twin developments, the Opticians Act and the improvement in educational standards, have taken opticians, particularly ophthalmic opticians, a long way from their confused pre-war condition. Their independent status within the National Health Service was finally established in 1968 when the Health Services and Public Health Act repealed Section 41 (4) of the National Health Service Act and changed the name of the supplementary service to the General Ophthalmic Service, thereby confirming the permanence of the service which had already been recognised in fact.

Eye care under the health services

Sight testing and the provision of spectacles may be considered as one part of eye care under the health services. Whereas the dentist is competent to provide virtually all medical services connected with the teeth, the ophthalmic service is primarily concerned with a single aspect of eye care, the measurement of optical defects and the

provision of appliances to correct these defects. The diagnosis and treatment of diseases of the eye is the province of the medically qualified practitioner acting in general practice or in hospitals. Major advances have taken place in the treatment of diseases of the eye since the inception of the National Health Service. Improved surgical techniques, as in corneal transplantation, have improved the prognosis for many eye conditions, while the use of antibiotics has helped to contain damage due to eye infections. In comparison, there have been only minor developments in the opticians' field of activity. The measurement of refractive errors and the appliances used to correct them have, in principle, remained unchanged since before the inception of the National Health Service. However, this single specialised aspect is by far the largest element in eye care as a whole, both in terms of expenditure and in terms of employment of qualified manpower. Expenditure, both public and private, through and under the General Ophthalmic Service amounted to about £50 million in 1968. The cost of treatment of eye conditions through hospitals, the General Medical Service and the Pharmaceutical services, amounted to only an estimated £15 million.

It is the sheer size of the ophthalmic service that militates against full integration with medical services as envisaged in the National Health Service Act. There are, however, very real problems inherent in the separation of eye-care services, and if it is impracticable to provide the ophthalmic services entirely within hospitals, then solutions must be sought elsewhere. The problems of separation have found expression in a certain amount of medical opposition to the independent status of opticians, for although the ophthalmic optician's work is primarily technical it can have quite considerable medical implications, and there have been doubts among some doctors whether ophthalmic opticians are fully competent to practise independently of medical control. In nearly all other fields of medical care, the technical and the medical aspects of treatment are linked and under the oversight of senior medical personnel.

To appreciate the issue, it is necessary to consider what the ophthalmic optician does. His two primary functions are sight testing and dispensing. The meaning of dispensing is quite clear, but the meaning of 'sight testing', the term used by the Department of Health, is not. It has alternatively been called 'refraction', but perhaps a more accurate term is 'eye examination'. Although it may vary considerably from practice to practice, the following is a simplified summary of its scope. First there is a general examination of the eyes and adnexa with loupe and ophthalmoscope and a test of visual acuity with the familiar optician's chart. Second there is the objective measurement of refractive error with a retinoscope. Third there is the subjective confirmation of the objective measurement,

using the patient's responses when confronted with a selection from a battery of lenses of varying power. Finally, there are various tests of binocular function occurring at various stages of the examination.

The procedure requires considerable skill but is relatively straightforward with the exception of the first part, the general examination of the eye. The ophthalmic optician is under a duty according to his terms of service to report any abnormality of the eyes to the patient's general practitioner. This means that the ophthalmic optician should suspect any pathological condition, though not diagnose or treat it. The belief that the ophthalmic optician is not fully competent to undertake this function has been the root cause of medical concern over the independent status of the optician. The competence of the ophthalmic optician under the General Ophthalmic Service is of great importance because he is most often the first point of effective contact with the health services for the patient¹. In practical terms, the patient is not normally referred by a doctor to the optician, but vice versa, and there may be a fear that a condition requiring medical treatment would not be recognised even though the patient may believe that his eye examination gave him a clean bill of health for all conditions of the eye. With the improved educational standards of the ophthalmic optician in recent years, medical concern has considerably diminished.

Whatever the medical views, ophthalmic opticians have a vital role to play in general eye care. The fact is that there are insufficient ophthalmologists to see every patient requiring sight tests inside or outside hospitals, and in the absence of a vast increase in the number of ophthalmologists, the alternative to an examination for eye conditions by the ophthalmic optician is no examination at all for the majority of patients. The ophthalmic optician can play a significant role in screening for pathological defects. Routine ophthalmoscopy may, for instance, be of some value in the early diagnosis of glaucoma, the cause of about 12 per cent of blindness in Britain today (Graham, P. A. 1969), and would also usually detect diabetic or other forms of retinopathy.

¹ Although for his first sight test a patient must obtain a referral from his general practitioner, or alternatively the executive council, this is virtually a formality which may soon be discontinued.

The provision of ophthalmic services

For a relatively straightforward service, the provision of sight tests and the supply of optical appliances display a remarkable degree of organisational complexity. There are three main ways in which patients can receive services. The vast majority of the work is done under what is now the General Ophthalmic Service, administered by the executive councils. The body of opticians is divided into two. The largest group, numbering 6,294 in the United Kingdom² at the end of 1968, are the ophthalmic opticians, entitled both to test sight and dispense. The patient after receiving his prescription is entitled to have it dispensed elsewhere, but normally it will be dispensed by the optician who performed the sight test. Dispensing opticians, who numbered 1,296 at the end of 1968, are entitled only to dispense. They normally dispense prescriptions for patients who have received sight tests from ophthalmic medical practitioners. The latter, who are medically qualified, number about 1,000. They are entitled to test sight only, and undertake a little under 20 per cent of all sight tests performed under the General Ophthalmic Service. Their role in relation to the testing of sight is the same as that of the ophthalmic optician. These ophthalmic medical practitioners normally work part time and very often hold appointments as eye specialists in hospitals.

Alternatively, ophthalmic services can be supplied under the National Health Service through hospitals although, as explained, hospital work has expanded little since 1948 and remains a small proportion of the total. There are a small number of ophthalmic and dispensing opticians employed full time by the hospital service, but a proportion of the sight testing and dispensing is performed on a sessional basis by opticians also operating under the General Ophthalmic Service. The work done under the hospital service tends to be more specialised. It involves the provision of optical appliances in difficult medical and surgical cases and a good deal of ophthalmic work concerned with children being treated for squint. Medical auxiliary orthoptists who are primarily responsible, under ophthalmologists, for exercises for the alleviation of squints among children, are employed almost entirely within hospitals.

² Figures from the General Optical Council refer to the UK. Figures from the Department of Health and Social Security refer to England and Wales and they include some double counting.

A third source of ophthalmic care is the school health service. Sight tests form part of the general medical screening provided for schoolchildren. Simple tests of visual acuity and a superficial eye examination may be undertaken by nurses; but the testing of sight is undertaken by doctors. If medical or orthoptic treatment is thought to be necessary the child will be referred to a hospital. Alternatively if a child's parents prefer to use the normal General Ophthalmic Service when glasses are required, they may be advised to consult an optician. In addition, specific groups of the population, such as those in the armed forces, can obtain ophthalmic services through their employment. Finally services can be obtained privately.

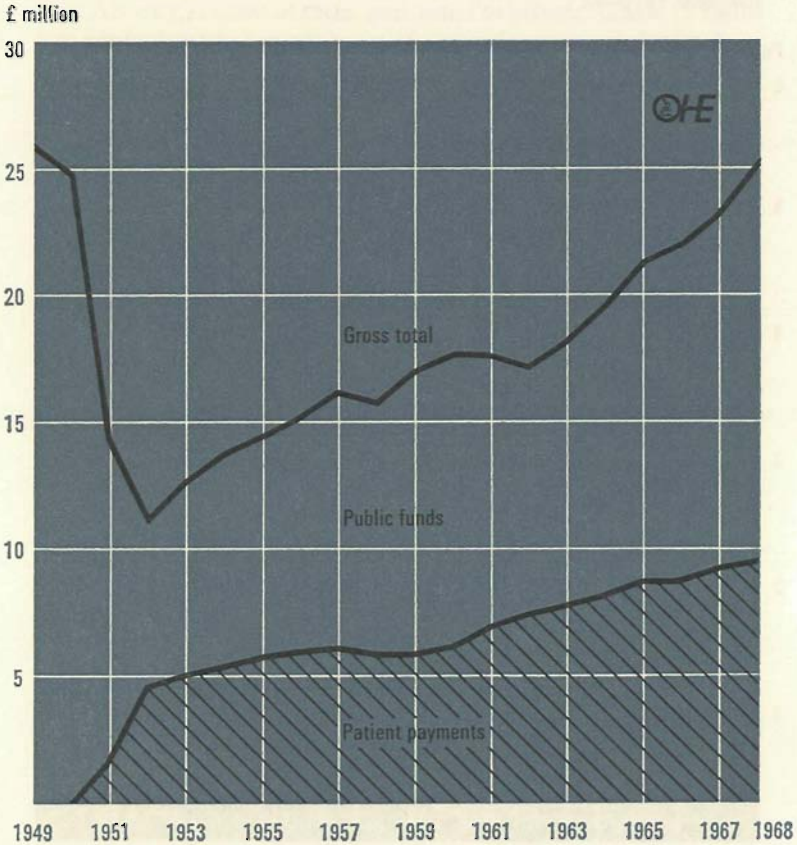
In common with dentists, the formal ties between opticians and their patients are not so strong as between general practitioners and their patients. The ophthalmic optician has no list and he is paid a separate fee for each item of service. Despite this, however, patients are likely to return to the same practitioner for subsequent sight tests and spectacles, and informal ties between the patient and the practitioner are likely to be established.

The cost of the ophthalmic service

The cost, recorded in the NHS account, of the General Ophthalmic Service in the United Kingdom in 1968 was £25.2 million. This compares with the £83 million spent on the General Dental Service. The £25.2 million represents the cost of sight testing and the cost of National Health Service optical appliances dispensed under the ophthalmic service, both the part paid by patients and the part paid from public funds. It excludes, however, the cost of frames and lenses which are not available under the National Health Service but which may be obtained privately from the optician after a National Health Service sight test.

Figure 1 shows the pattern of expenditure since 1949. In 1949 and 1950 the availability of free sight tests and free spectacles for the first time for all sections of the population resulted in extremely high usage of the service, particularly among older persons who often required two pairs of glasses. This, together with the relatively high level of fees for sight testing, was reflected in high expenditure during those first two years, £25.9 million in 1949 and £24.7 million in 1950. Overall National Health Service expenditure was also rising rapidly during this period, and as part of a decision to keep government expenditure on health below £400 million, the government in 1951 imposed charges to the patient of £1 for each pair of lenses supplied, and the actual cost of the National Health Service frames, although sight tests remained free and there was a free range of spectacles for children. There followed an immediate

Figure 1 *Cost of the General Ophthalmic Service, United Kingdom.*
Public funds and patient payments £ million 1949-68

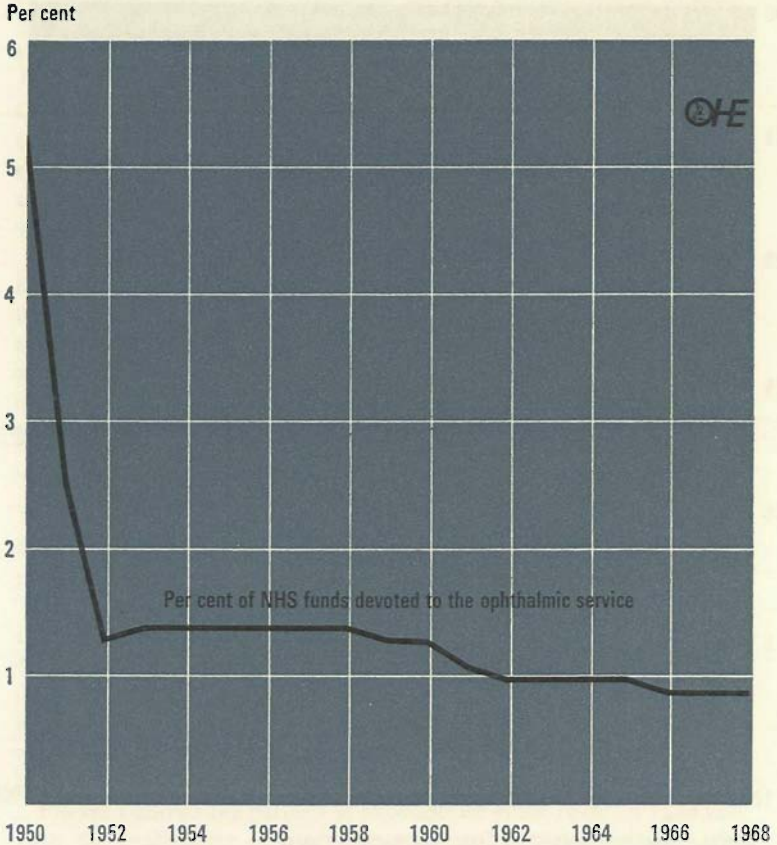


Source Annual Abstract of Statistics, various years.

decrease in usage of the service and consequently a dramatic decline in expenditure. This reached a low point of £11.1 million in 1952 and since then has risen gradually to £25.2 million in 1968. Even without taking price changes into consideration, expenditure has not yet reached the level obtained in the first two years of the service.

However, it has been previously noted that the cost of sight testing and goods dispensed under the National Health Service is not equal to the overall cost of optical appliances. It excludes the growing private sector. In the very early years of the service, although no figures are available, the number of persons opting for private frames with National Health Service lenses or private frames to-

Figure 2 *Cost of the General Ophthalmic Service financed out of public funds as a percentage of the cost of the NHS to public funds. United Kingdom 1950-68*



Source Annual Abstract of Statistics, various years.

gether with private lenses was probably low. There was some confusion as to whether a patient could ask his optician to fit National Health Service lenses to private frames purchased specifically for that purpose. Also, only a small proportion of these persons joining in the initial rush would have opted for private frames. However, since 1953 it has been accepted practice that National Health Service lenses may be fitted to suitable privately purchased frames, and with accompanying changes in fashion the private sector has probably grown at a faster rate than the National Health Service sector.

To summarise the position in the United Kingdom in 1968, 6,402,000 pairs of lenses were supplied under the National Health Service. About 3,250,000 of these were fitted to private frames. In addition, approximately 500,000 pairs of spectacles composed of private lenses and private frames were supplied to patients after a National Health Service sight test. Together with a small number of private spectacles supplied after a private eye test and a small but growing number of privately supplied contact lenses, it has been estimated that the cost of this private sector added another £24 million³ in 1968 on to the total of £25.2 million shown in the National Health Service accounts. Thus the overall cost of sight testing and the supply of optical appliances under, or through the same channels as, the General Ophthalmic Service totalled some £49 million in 1968. The addition of hospital and school expenditure on sight tests and optical appliances would bring the total to over £50 million.

Lack of statistical information on the large private sector renders impossible a true comparison between the cost of the service in the very early years and the cost of the service now. However, it is interesting to note that the contribution from public funds to the service as a percentage of the cost to public funds of the entire health services has dropped from 5.2 per cent in 1950 to 0.9 per cent in 1968, Figure 2. The extent of support for the service through personal expenditure by patients is demonstrated by Table 1, showing the build-up of expenditure on the General Ophthalmic Services in 1968.

Table 1 *Build-up of expenditure under and through the General Ophthalmic Service, United Kingdom. 1968*

	<i>Expenditure from public funds £ million</i>	<i>Expenditure by patients £ million</i>	<i>Total £ million</i>
For NHS sight testing	8.0	—	8.0
For the supply of NHS frames and lenses	7.8	9.4	17.2
For the supply of frames, lenses and other optical appliances not available under the NHS, and sight tests obtained outside the NHS	—	24.0	24.0
Total	15.8	33.4	49.2

Source Annual Abstract of Statistics 1969. Optical Year Book 1969.

Note Public funds expenditure in Scotland and N. Ireland apportioned between sight testing and dispensing in the same ratio as England and Wales.

³ Estimate from the Optical Year Book 1969.

Only £15.8 million, or 32 per cent of total expenditure was met from public funds in 1968 and this proportion will have fallen further since the recent increase in charges. Payments from public funds cover National Health Service sight testing fees, currently £1 5s 9d when provided by an ophthalmic optician, and also the dispensing fee for National Health Service frames or lenses. The dispensing fee varies, but for single vision lenses in a National Health Service frame it is £1 8s 6d at present.

For his part, the patient who chooses a National Health Service frame must pay for its actual wholesale cost. By far the most popular frame, no. 524, costs 13s 3d, but others range from 8s 3d to 34s 9d. In addition, since the increase in charges in 1969, the patient must pay a flat rate of 32s for each pair of single vision lenses, 50s for each pair of bifocals supplied under the National Health Service and additional sums for lenses of special types. These payments towards the cost of lenses in fact virtually cover the overall wholesale cost of lenses. Some lenses cost more and some cost less than the charge made to the patient. Thus expenditure from public funds on the supply of National Health Service frames and lenses in effect covers dispensing fees.

In a typical case, therefore, when National Health Service single vision lenses are fitted to a National Health Service frame, the total cost of the whole procedure from sight testing to dispensing is in the region of £4 17s 6d, of which the patient contributes approximately one half. The cost is increased considerably with the use of private frames, and the patient pays the whole of the excess. The greater cost of spectacles with private frames partly reflects the higher cost of private frames, but mainly reflects the higher margin or 'dispensing fee' charged by the optician on non National Health Service work. No information is available on the average sum charged for private frames, but this makes up the major part of the £24 million shown against wholly private expenditure in 1968 in Table 1.

The ophthalmic service, therefore, which began in 1948 as a free service supplying approved National Health appliances has grown primarily through the injection of private expenditure into non National Health Service goods. In no other sector of the health services does the proportionate contribution to expenditure by patients themselves reach the same order of magnitude as the overall 68 per cent under the ophthalmic service.

Demand and supply

a) Demand

In the first six months of the ophthalmic service, the number of sight tests given in England and Wales was running at an annual rate of over 8 million, a figure which has not been reached since

(Figure 3). For the first time free services were available to all sections of the community, and there were many persons, particularly the old, who had never had a sight test before. Probably the initial rush was greater than in any other sector of the health services, including the dental service, and although supplies were strained past the limit, the satisfaction of demand ranks as a significant early achievement of the National Health Service. By 1950, before charges came into force, much of the initial pent-up demand had been expended and the number of sight tests had already declined to 4,900,000. Expenditure was only maintained at the 1949 level in this year because of the time lag between prescription and the provision of spectacles by overstrained supply facilities. Delays of up to a year were experienced.

The number of sight tests increased steadily after 1952 and had returned to the 1950, pre-charge, level by 1956. Thus the decrease in underlying demand, that is the demand for sight tests, after the introduction of charges, was not so great as the expenditure figures appear to indicate. Between 1953 and 1968 the number of sight tests provided in England and Wales has grown at a rate of 3 per cent per annum, to reach 6,633,000 by 1968. Figure 3 shows how after the early years the number of glasses supplied has risen in phase with the number of sight tests, though at a slightly lower rate. The proportion of sight tests followed by prescriptions, however, has been fairly constant since the early 1950s. In 1968 it was 86 per cent. The discrepancy between the rate of growth of sight tests and the rate of growth of spectacles supplied is accounted for by two other factors. First, there has almost certainly been a growth since the 1950s in the number of all-private glasses supplied after a National Health Service sight test. Glasses so supplied do not appear in National Health Service statistics. Second, there has been a steady increase in the number of bifocals supplied to persons with 'middle aged sight', needing two corrections, who would otherwise need two pairs of spectacles. Bifocals accounted for 11.7 per cent of all spectacles supplied in 1953. In 1968 they accounted for 19.8 per cent.

The demand for ophthalmic services varies considerably by sex and age. A survey conducted by the Department of Health in 1959 revealed the breakdown shown in Table 2 for sight tests and pairs of spectacles authorised by executive councils.

As may be expected, usage of the service is very much greater over the age of 45, for this is normally the age of onset of 'presbyopia', or middle aged sight. A decline in accommodative power, often necessitating two corrections, usually takes place at about this age. Table 2 also indicates somewhat unexpectedly that female usage of the service is greater than male usage, especially among 15-24 year olds, where females receive almost twice as many sight tests and

Figure 3 *Numbers of sight tests given and numbers of lenses supplied, England and Wales, 1949-68*



Source Ministry of Health Annual Reports, various years.

Note In 1959 change in definition of number of sight tests.

spectacles as males. There is, however, no known physiological explanation for this, and although it is known that in general women tend to seek medical services more readily than men, this factor alone could not account for the pattern of usage shown in Table 2. It appears clear from the statistics that personal reactions to the wearing of spectacles largely determine the high demand for ophthalmic services among girls and young women. They do not shun spectacles entirely, but rather, with a high degree of sensitivity to the cosmetic aspects of spectacles, they are more likely to change them more often than men. This leads many to seek a sight test, and perhaps a pair of lenses, incidental to their primary objective which is the acquisition of an additional spectacle frame⁴. Nowhere else within the health service is medical care so inextricably mixed with fashion. It is this dual aspect of the ophthalmic service, and the scope for consumer choice which is its corollary, which has led to the present extent of personal expenditure by users of the service.

If the age specific rates for sight tests had remained unchanged at the 1959 level throughout the twenty years of the health service, then changes in the population mix would have accounted for an

Table 2 *Sight tests per 1,000 population, England and Wales, 1959*

<i>Age</i>	<i>males</i>	<i>females</i>	<i>total</i>
0-14	44	51	47
15-19	80	146	112
20-24	61	106	84
25-34	63	88	75
35-44	77	105	91
45-54	192	229	211
55-64	173	208	192
65+	144	175	161
All ages	99	133	117

Glasses authorised per 1,000 population, England and Wales, 1959

<i>Age</i>	<i>males</i>	<i>females</i>	<i>total</i>
0-14	31	36	33
15-19	64	115	89
20-24	51	83	67
25-34	51	71	61
35-44	70	95	83
45-54	213	261	238
55-64	197	242	221
65+	163	201	186
All ages	100	135	118

Source Ministry of Health Annual Report for 1960

⁴ New glasses, however will not be supplied under the NHS unless there has been an acceptable change in prescription.

increase in sight tests of about $\frac{1}{2}$ per cent per annum. In fact, however, it has been noted that the number of sight tests in England and Wales rose at an average annual rate of 3 per cent between 1953 and 1968. Thus an increase of $2\frac{1}{2}$ per cent per annum remains to be explained by other factors. It is likely that this increase in demand reflects not a change in the prevalence of optical defects, but an increasing awareness of visual needs and a greater willingness to seek and accept treatment. A similar trend can be observed in almost all sectors of the health service, where increasing health consciousness has led to rising demand, even where morbidity has remained constant or even decreased. Also, in strictly functional terms, visual acuity may have become more important to the individual since the inception of the National Health Service. The spread of car ownership and television may well have stimulated the demand for ophthalmic services. Among old people especially, the existence of television may often have created a need to see well which did not exist previously.

b) Supply

The performance of the ophthalmic service, or the adequacy of supply, can be measured on two levels. First it can be measured in relation to need, and second, on a rather more superficial level, it can be measured in relation to demand.

There is no simple answer when the question of performance is posed on the first level. There are an estimated 24 million spectacle wearers in the United Kingdom, but precise information on the prevalence of uncorrected optical defects or new optical defects among existing spectacle wearers is not available. Two recent screening surveys have indicated a wide gap between the need for and the supply of corrections. A report by the Optical Information Council (Optical Information Council 1969) analysed the results of 20,000 persons screened for optical defects. It was found that 43 per cent were likely to be in need of corrective treatment. Another report analysing the results of the first 1,000 persons to attend a mobile health clinic in Southwark showed that 30 per cent of those screened had eye disorders (covering optical defects and eye diseases). This was the most common type of disorder found. However, for two reasons, the results of these surveys must be treated with caution. First, there is the likelihood of bias through self selection. (In both cases the persons screened came forward on their own initiative and did not, therefore, represent a random sample of the population). Second, the measure of visual abnormality differed between the two surveys, and in the last resort must be subjective. Despite these reservations, the surveys that have been conducted do tend to show that optical defects, if only of a

minor nature, are among the most common disorders, and furthermore the Optical Information Council survey indicates that it does not follow from the mere possession of spectacles that defects have been corrected. The survey showed that more spectacle wearers than non spectacle wearers had uncorrected optical defects, largely because of the time lapse between sight tests among spectacle wearers.

However, it must be assumed that the majority of persons who have some form of optical defect but do not seek treatment under the General Ophthalmic Service do not consider that they are suffering from any significant disability. In some instances the use of specific functional criteria can act as a guide to need. For instance, a screening project covering a period of years (Ophthalmic Optician 1965) indicated that among driving licence holders in the United Kingdom there are likely to be 150,000 with standards of vision below present statutory requirements, and another 1½ million drivers whose vision, while satisfying statutory requirements, would deteriorate rapidly under adverse conditions. Functional criteria can also act as a guide to need in industry, but in general terms. There are so many activities requiring different standards of eyesight that even if precise information on the prevalence of defects was readily available it would not be possible to make a simple comparison between need and supply.

It common with other sectors of the health service, no attempt is made through the General Ophthalmic Service to seek out need. However, there is considerable 'point-of-sales' advertising in the form of signs and window displays at high street opticians' premises. The service is available on demand and there are few restrictions on the supply side, except the existence of charges payable by patients, which might create a gap between need and usage of the service. It has been noted that the original introduction of charges in 1951 was immediately followed by a very large reduction in expenditure on the service, but that this was not primarily a result of the imposition of charges themselves. The fact that underlying demand as expressed by the number of sight tests performed had returned to the pre-charge level by 1956 suggests that charges did not create a significant barrier to treatment for the majority of users. Most users of the service have in fact spent larger sums on optical appliances, through the purchase of private frames or even wholly private spectacles or contact lenses. Figures are not available in earlier years, but the proportion of adults choosing private frames increased from 39 per cent in 1961 to 53 per cent in 1967.

This of course tells us nothing about the minority of users, or the non-users, particularly among the elderly, to whom charges may represent a significant barrier to treatment. Guillebaud (HMSO

1956), when recommending a reduction of charges when sufficient resources became available, specifically mentioned those living on small fixed incomes. However, if there is any barrier to treatment it is not in reality an economic one, since the Supplementary Benefits Commission is empowered to make grants in respect of the whole or part of the cost of National Health Service spectacles upon application by a claimant. Rather, the barrier is associated with the stigma or effort involved in applying for supplementary benefits. This must undoubtedly penalise some, but the total cost of supplementary benefits for National Health Service spectacles suggests that the numbers may be small. In Great Britain in 1968 the Supplementary Benefits Commission paid £1,256,000 to meet the cost of NHS spectacles in 575,000 cases of need. This represented 14 per cent of the total sum paid by patients for National Health Service spectacles. In comparison the Commission paid £816,000 for 220,000 cases of dental treatment, or 6 per cent of all payments by dental patients.

It is interesting in this context to consider the real effect of the recent highly publicised increases in charges for lenses. Between 1951 and 1969 the charge for a pair of single vision lenses, the type most commonly supplied, increased from 20s to 32s, an increase of 60 per cent. In the same period the cost of living has increased by 80 per cent. Although within the context of the health services as a whole increased charges may have greater significance, within the ophthalmic services, they represent no radical departure from existing norms. Charges for National Health Service frames, since they are tied to actual cost, are continually increasing while private expenditure as a whole on the service has, since the nineteen-fifties, been considerably in excess of public expenditure.

When the question of the performance of the ophthalmic service is posed on the rather more superficial level, in relation to the provision of services in response to actual expressed demand, it is rather more easily measured. The General Ophthalmic Service is one of the least criticised sectors of the health service. Sight testing and dispensing are relatively straightforward operations compared with the complexities of medical treatment, while the existence of a large private sector has given the service a greater degree of flexibility and choice than is common in other parts of the health service.

The consumer's most frequent criticism of the quality of the service is the restricted range of optical appliances available under the National Health Service. In particular, this finds expression in criticism of the range of National Health Service frames. There are at present twenty frames available for adults. They have changed little throughout the last twenty years. Only five of them were not available in 1950 and all of these had become available by 1955. One

of these frames, no. 524, is overwhelmingly the most popular in the range. There is no doubt that these National Health Service frames are functionally of a high standard, but equally there is little doubt that a large and increasing number of people, particularly women, find them cosmetically unacceptable and choose from a very much wider and constantly changing range of private frames. The distinction between the medical and cosmetic aspects of optical appliances must often be an arbitrary one. It may often be that spectacles must look attractive if full benefit is to be derived from them, or if they are even to be worn at all. On the other hand fashion is arguably outside the scope of publicly provided health services, particularly in the context of limited resources. In practice, however, the disadvantages of a restricted range of National Health Service frames are mitigated by the nature of the provision of the ophthalmic services. The customer can normally purchase private frames without foregoing the other benefits available under the ophthalmic service from public funds. Furthermore, the customer's attention is drawn to privately available products during his visit to the optician, and the existence of National Health Service charges means that the price differential between a National Health Service frame and a private frame is not so great as to exclude the latter from consideration. The organisation of supply, therefore, does not militate against the support of innovation through private expenditure, at least in the case of spectacle frames. Without the encouragement of choice through private expenditure, a restricted range of National Health Service frames would have to be viewed in an entirely different light. A comparison can be made with the supply of hearing aids. The choice here lies between free National Health Service aids which are of a high technical quality, but which lag many years behind in cosmetic terms, and commercial aids which are generally no better technically but which normally exploit modern possibilities of miniaturisation. The price differential between the two groups is such that most users are debarred from enjoying the advantage, albeit cosmetic, of miniaturisation.

Among spectacle lenses, the scope for innovation is to some extent limited by the nature of the product. No wholly new method of correcting refractive errors has been found, and developments that have taken place have been essentially variations on a fixed theme. Curved lenses and (at an extra charge) toughened glass lenses and plastic lenses have all become available through the National Health Service since 1950, but otherwise the range of National Health Service lenses has remained virtually the same. Other innovations have taken place outside the National Health Service range. Although available through the hospital eye service on grounds of clinical necessity, contact lenses are, in practical

terms, available only privately for the vast majority of persons who desire them; the same is true of multifocal lenses. Probably the major innovation of recent years has been the continuous change lens, where the lens power changes continuously instead of in discreet steps as in bifocal and multifocal lenses. These were developed in France and introduced into Britain in the early sixties. They are not available under the National Health Service, nor are lenses incorporating anti-reflection coatings, the major innovation among single vision lenses. They were introduced in the late fifties.

The range of lenses available under the National Health Service is adequate but limited. If any other, newer types of lenses are desired, the patient is normally free to purchase them without foregoing other ophthalmic benefits. The situation is similar to that in respect of spectacle frames, but there is an important distinction. With the exception of contact lenses and some tinted lenses, the advantages of non National Health Service lenses are primarily technical rather than cosmetic. For this reason there is less justification for excluding them from a publicly provided service, even though many will maintain that the technical advantages are trivial. Furthermore, since non-expert consumers are less capable of measuring technical than cosmetic advantages, the price differentials between National Health Service and privately obtained lenses are likely to discriminate against the latter. While purchasers are willing to pay for attractive frames they are unlikely to pay a considerable extra sum for lenses which may be only marginally different, or which have advantages that are not immediately apparent. Whatever the merits of the types of lenses outside the National Health Service range, it is clear that the demand for them, particularly multifocals and continuous change lenses, is very much less in Britain than in other countries where the distortions in relative price levels, created by the limited National Health Service range, do not exist. Under 10 per cent of spectacles purchased incorporate privately obtained lenses and most of these differ only in shape from lenses available under the National Health Service. They are only purchased privately because, as with rimless spectacles, National Health Service lenses will not always fit the type of frame chosen. The low level of demand for non National Health Service lenses is also likely to inhibit suppliers and make these lenses less readily available. Discussion of this aspect belongs to the next section.

The supporting industry

There are three links in the optical supply chain. There are bulk manufacturers of frames and lenses, prescription houses and finally there are the ophthalmic and dispensing opticians. The value of production of spectacle frames and lenses at manufacturers' prices

was estimated to be £10.9 million in 1968. The manufacturing industry is therefore a small one, though many firms also produce other optical goods and instruments. The vast majority of turnover is in the hands of a small number of firms.

There are about 400 prescription houses throughout the country, mainly small concerns. They perform both wholesaling and factoring functions. They purchase National Health Service and other lenses and frames from the manufacturer, either in finished or semi-finished form and fit the lenses to frames according to orders placed by ophthalmic and dispensing opticians.

The ophthalmic and dispensing opticians are in effect the retailers. They do not normally fit frames to lenses, though repair work is often done in their workshops. In common with pharmacists, opticians' practices are often owned by multiple chains. This occurs more extensively among the dispensing opticians than among ophthalmic opticians. In 1968 a little under 900 limited companies owned 2,000 ophthalmic optician premises. The four largest owned 16 per cent of these. In comparison, a little over 100 limited companies owned 600 dispensing optician premises. The four largest between them owned almost half of these. Some of these companies also own prescription houses and are able to benefit through integration of much of the chain of supply.

Prices are determined in one of two ways, depending on whether the appliances are supplied through the National Health Service. In the case of National Health Service goods, prices for each product, whether frames or lenses, are negotiated between the Department of Health and the manufacturers and prescription houses. Unlike the pharmaceutical service the basis of negotiation is simple. Since frames and lenses have changed little since the inception of the health service, price changes normally follow requests for higher prices owing to increases in manufacturing costs. Under this system prices have risen more slowly than manufacturing costs in general. The price of frame no. 524, accounting for most of the turnover, increased by 61 per cent between 1951 and 1969. The unweighted average price increase of single vision lenses was about 20 per cent in the same period. Prices of frames and lenses are set out, together with National Health Service sight testing and dispensing fees, in the 'Statement of Fees and Charges' and are recoverable by the optician after he has supplied the appliance.

In contrast, among privately available products, prices are determined by the operation of market forces. Prices paid by opticians to manufacturers and wholesalers for private frames are generally higher than prices for National Health Service frames, reflecting shorter production runs and higher marketing and development costs. The major part of the differential between private and

National Health Service frames to the consumer, however, is composed of the 'margin' or 'dispensing fee' that the optician is able to determine freely in his private capacity. The size of this margin can vary considerably, and no average figure is available, but it is certainly very much higher than the corresponding sum obtainable under the National Health Service.

It may be that the control over prices exercised by the government in the National Health Service sector has inhibited development of new types of lenses in Britain. Not only is there little scope for selling any new products that might be developed, but also the price negotiations which tend to be on a cost-plus basis are sufficiently rigid to ensure that there is little margin available from the sales of National Health Service products for research and development for new types of lenses. The small market that exists for lenses outside the National Health Service range is therefore largely dependent on products developed abroad. It is true that few complaints will be heard from the consumer over the quality of lenses supplied, but it is equally true that one of the effects of the National Health Service has been to prevent the newer types of spectacle lenses, whatever their merits, from being readily available to the majority of people in Britain.

Demand and supply in the future

It is implicit in this discussion, and in the organisation of the General Ophthalmic Service, that the service is primarily geared to the supply of spectacles. However, some in the ophthalmic optical profession prefer to see their role in the future more in general sight care terms than as retailers of spectacles. A move to more generalised care could take two forms. First, the ophthalmic optician can perform a useful function in screening for various forms of eye disease, although not all ophthalmologists are fully convinced of this. Second, if the general public's attitudes to eye care change in such a way as to create a demand for regular eye inspections, then the optician is likely to be faced by a trend towards more sight tests with proportionately fewer prescriptions for spectacles. In the past most patients have tended to seek ophthalmic services solely to obtain a pair of spectacles. Any change in this respect must stem from a change in the pattern of demand among the patients themselves, but the fulfilment of both this role and the medical screening role must depend ultimately on the objectives of the General Ophthalmic Service as defined by the Department of Health. At present, remuneration under the National Health Service is heavily weighted towards the encouragement of the spectacle supplying aspect of the service, and the optician is likely to find a conflict between his business interests and his professional leanings.

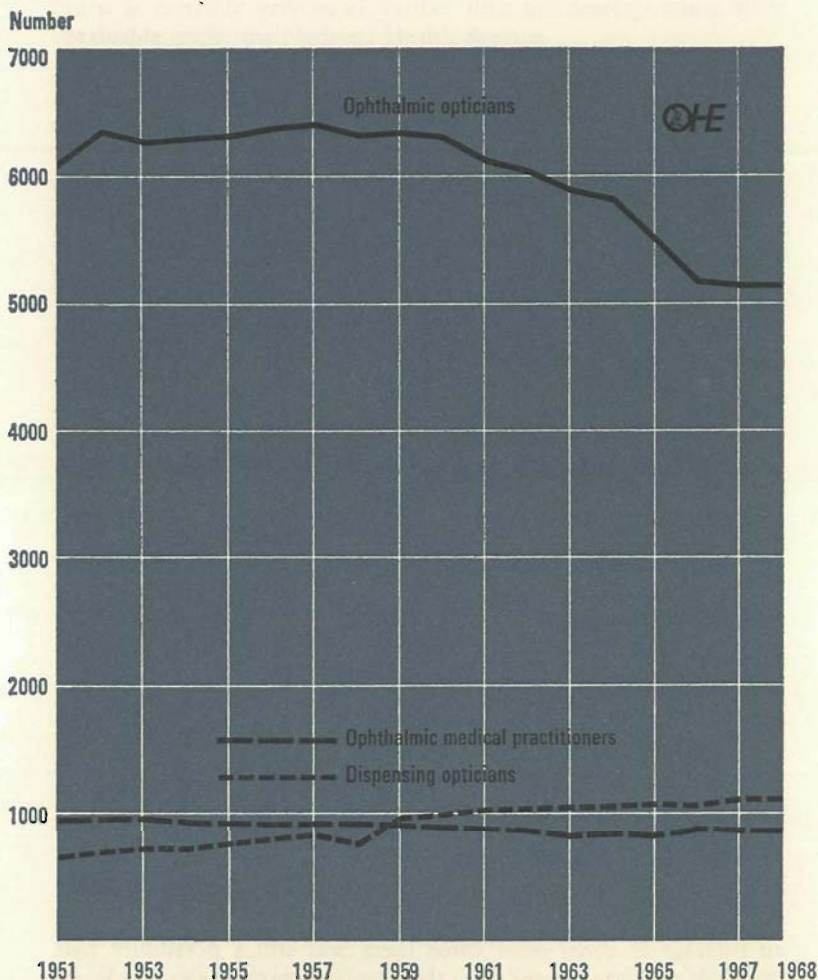
As previously noted, practitioners within the General Ophthalmic Service are divided into three groups, ophthalmic medical practitioners, ophthalmic opticians and dispensing opticians. Figure 4 shows the changes that have taken place in their numbers in England and Wales since 1951⁵. In addition, the eye care team includes general practitioners and ophthalmologists in hospitals. Practitioners from both of these medical groups may double as sight testing ophthalmic medical practitioners under the General Ophthalmic Service. Finally there are orthoptists, mainly composed of women, who work in hospital, under the control of specialist ophthalmologists.

The number of ophthalmic medical practitioners, who provide 19 per cent of all sight tests, has declined over the last twenty years. On the other hand the number of dispensing opticians, who normally dispense ophthalmic medical practitioners' prescriptions, has increased at a rate faster than the rate of increase of the population. Ophthalmic opticians, the largest group, increased slightly in numbers in the early years of the service and remained fairly static between 1952 and 1960. Following an increase in retirements from the profession and a decrease in new entrants, their numbers dropped from 6,367 in 1960 to 5,067 in 1968. Some members of the profession have expressed concern over this trend and efforts have been made to reverse it through encouragement of new students. With the elevation of technical colleges to university status, the number of new students has increased in recent years. The first of the graduate opticians have now entered the profession and the decline in numbers of ophthalmic opticians has been arrested.

Figure 5 shows for comparison the numbers of ophthalmologists, opticians and orthoptists employed in the hospital service. The most significant point is the small size of the optician establishment. After an increase in early years when there was still a possibility that hospitals might take over from the supplementary service, the number of opticians declined to 91 by 1968.

⁵ The figures in Figure 4 are different from those quoted from the General Optical Council register in the previous section on the 'provision of ophthalmic services'. This is because some opticians are on the list of more than one executive council and Figure 4, by showing aggregates for all executive councils, includes some double counting. Also Figure 4 refers to England and Wales, while the GOC figures refer to the United Kingdom.

Figure 4 *Numbers of ophthalmic medical practitioners, ophthalmic opticians and dispensing opticians, England and Wales, 1951-68*



Source Ministry of Health Annual Reports, various years.

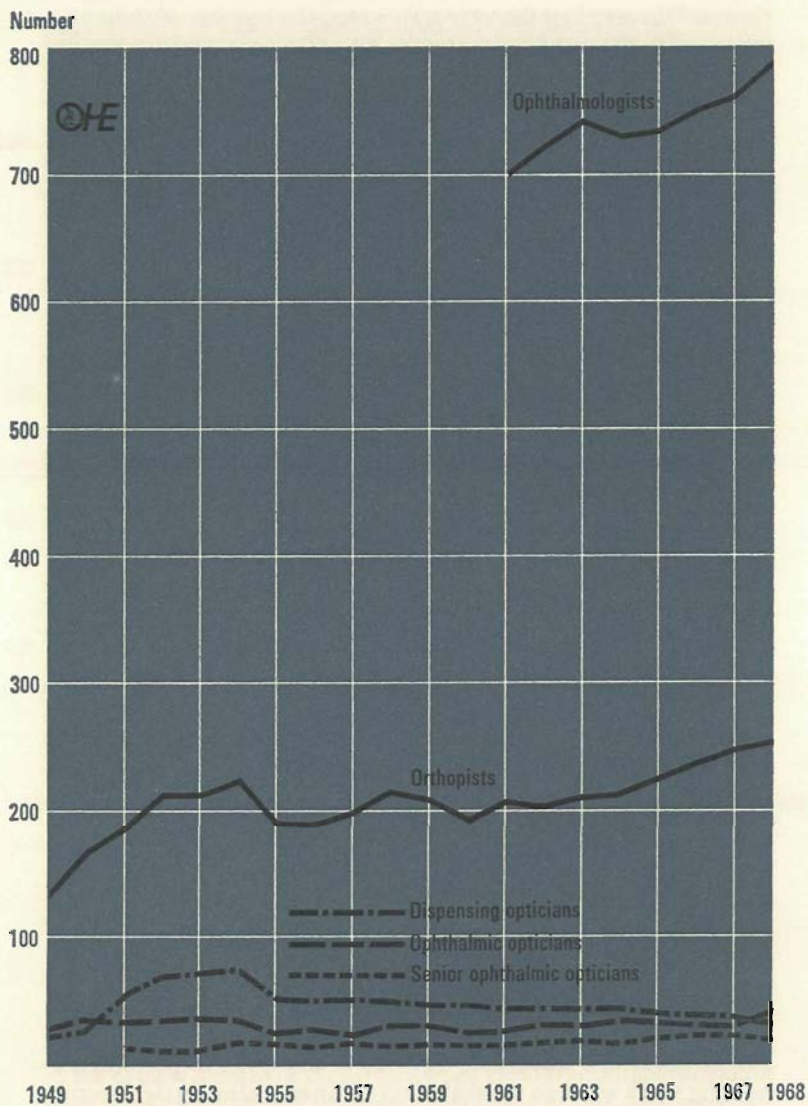
Notes to figure 5

1 Figures refer to whole-time equivalents.

2 Figures are not available for ophthalmologists before 1961, nor are they available for senior ophthalmic opticians before 1951.

3 For the years 1949 to 1954 inclusive figures for whole-time equivalents have been estimated on a different basis from the years 1955 to 1968 inclusive.

Figure 5 Numbers of ophthalmologists, senior ophthalmic opticians, ophthalmic opticians, dispensing opticians and orthoptists in the hospital service, England and Wales, 1949-68



Source Derived from Ministry of Health Annual Reports, various years.

For notes see foot of opposite page.

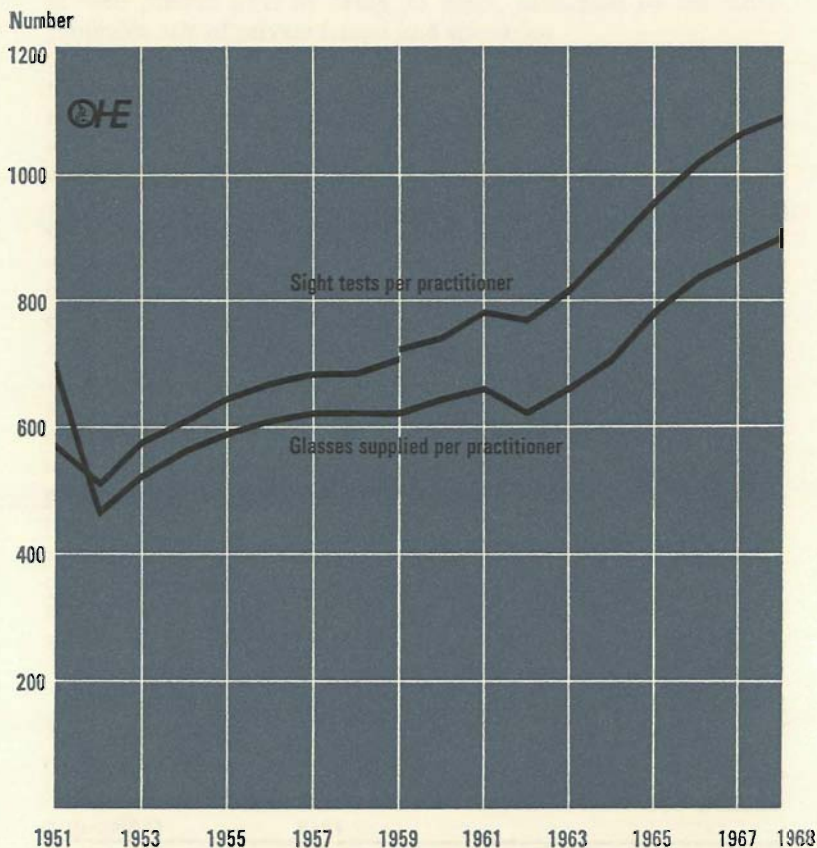
Figure 6 shows the number of sight tests and the number of pairs of glasses supplied per practitioner under the ophthalmic service in England and Wales. Ophthalmic opticians are included in each graph since they combine sight testing with the dispensing of glasses. Disregarding the very early years, the number of sight tests per optician increased at an average rate of 5.1 per cent per annum between 1952 and 1967, and the number of glasses supplied per optician increased by 4.1 per cent per annum, more if privately purchased glasses are taken into account.

On the face of it, this is a significant achievement by the ophthalmic service, similar to the achievement of the dental service in utilising technological advances and increasing productivity per dentist. In part, at least, however, the increase in productivity is illusory in that it simply reflects changes in the numbers of whole-time and part-time opticians. Most ophthalmic medical practitioners work only part time under the service and by no means all ophthalmic opticians work full time. There is little precise knowledge of the hours worked by opticians, but there has certainly been a decrease in the last twenty years in the number of part-timers, parallel to improvements in education and expertise. There has, for instance, been a steady reduction in the proportion of chemist/opticians carrying on both professions, though even in 1968 they still accounted for 18 per cent of all ophthalmic opticians.

Technological advances can have had little effect on productivity. The sight testing aspect has changed little in principle in the last twenty years and the use of recently developed techniques and instruments would be as likely, through extending the content of the sight test, to increase the time taken as to decrease it. The total time taken to perform an average sight test is said to be about half an hour. Dispensing by the optician consists of interpreting the prescription, guiding the patient in the choice of suitable spectacles, taking his facial measurements, and ultimately fitting the completed glasses to his face. These procedures are not generally amenable to productivity improvements through technological advances.

That part of the increase in productivity which is not illusory can be explained primarily in terms of the organisational structure of the optician's practice. The increasing use of a secretary or receptionist to make appointments or do the paperwork has left the optician free to do more sight testing and dispensing work. Changes in organisation of a more fundamental nature have increasingly taken place when, in a large practice, a dispensing optician is employed to perform dispensing work while an ophthalmic optician specialises in sight testing work. In recent years the trend towards amalgamation culminating in 1968 in the takeover of three large chains by Slater, Walker Limited, has probably increased the scope for this sort of specialisation.

Figure 6 *Number of sight tests per practitioner and number of pairs of glasses supplied per practitioner under the ophthalmic services, England and Wales, 1949-68*



Source Ministry of Health Annual Reports, various years.

Note Practitioners giving sight tests are ophthalmic medical practitioners and ophthalmic opticians. Practitioners supplying glasses are ophthalmic opticians and dispensing opticians.

There remains substantial potential for further increases in productivity, if increased demand makes this necessary. A static or even a declining optician population will not necessarily cause shortages or delays in treatment. The flexibility of supply was demonstrated in the earliest months of the service when very large numbers of sight tests were undertaken. The delays experienced at that time were primarily a result of the inability of lens manufacturers to expand productive capacity sufficiently at such short notice.

Remuneration

Negotiations to determine the fees for National Health Service sight testing and dispensing among ophthalmic and dispensing opticians take place through the Optical Whitley Council. Negotiations for the medically qualified ophthalmic medical practitioners fees take place through the British Medical Association.

In 1948 a 25s dispensing fee per pair of glasses and 15s 6d sight testing fee were agreed. They were based on average figures for private fees at that time. With the initial heavy demand for services, however, these fees were soon reduced. Table 3 shows how the fees for the commonest items of service have changed between 1950 and 1969.

Since between 1950 and 1969 the purchasing power of the pound has halved, it can be seen that remuneration per item of service has declined in real terms. What has been called the 'treadmill' system in the dental service, whereby unit fees are restrained as the volume of work done increases, is operative in the ophthalmic service as well. However, whereas the increased productivity per dentist, as measured by the work performed per registered dentist, has truly reflected more rapid performance of units of service by individual dentists, the increased productivity of opticians by the same measure is partly illusory in that it merely reflects a reduction in part time practitioners, and possibly a reduction in under-employment among full time practitioners.

Table 3 *NHS fees 1950 and 1969*

	1950	1969
Sight testing by an ophthalmic medical practitioner	1 5 0	1 8 0
Sight testing by an ophthalmic optician prescribing glasses	14 0	1 5 9
Dispensing fee, single vision lenses, using NHS or other reglazed frames	1 4 0	1 8 6
Dispensing fee, single vision lenses, using new private frames	—	1 0 6

Source Statements of Fees and Charges 1950 and 1969.

The reductions in practitioners' National Health Service fees in real terms can only be understood in relation to the private sector. Although in negotiations through the Optical Whitley Council the

extent of the private sector has been excluded from consideration as a criterion for determining National Health Service fees, there is little doubt that National Health Service fees can only be maintained at their present level by being, in effect, subsidised by the more profitable sale of private frames and spectacles.

This has important implications for the future development of the ophthalmic optician's role, for it heavily weights his activities in favour of dispensing and militates against a trend towards general eye care including visual screening and more comprehensive eye examinations. The fulfilment of this role would necessitate higher expenditure on instruments and a greater expenditure of time on what is probably, under the present terms of service, the least remunerative sector of the optician's practice. If, therefore, ophthalmic opticians are to develop this role, it will require a fundamental change in the attitude of the Department of Health to the objectives of the General Ophthalmic Service, and a restructuring of the system of fees. In the near future this appears unlikely. The present system, relying largely on the private sector, is undoubtedly one of the cheapest methods of providing a comprehensive service up to a minimum standard, and the merits of any change requiring increased public expenditure must be measured against the merits of other possible uses of increased health expenditure. In the absence of any pressing public demand for a change in the emphasis of the ophthalmic services, there must be little doubt that there are many other sectors of the health services, involving matters of life and death, which will have a prior claim on any new resources.

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