THE WORK OF THE GENERAL PRACTITIONER

an analytical survey of studies of general practice*

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In a previous paper,† we stressed the need to take stock of the large and still growing number of studies of general practice. A mass of information has been generated but, so far, no attempt has been made to establish what has been accomplished. In this paper we attempt to systematize the material directly relevant to the work of the general practitioner and to draw general conclusions. Thirty seven studies proved to be useful for our purpose, ranging in scope from a large sample survey to the study of one practice by a general practitioner and in style from published books to letters to the medical journals. The studies are listed at the end of the paper, together with a reference number. These reference numbers are used throughout the paper.

Many of the studies reviewed had, in mind, objectives other than work, notably morbidity, and a number clearly had no one purpose. Therefore, much—indeed most—of our material has emerged as a by-product. To reduce the necessarily disparate data to comparable forms has not been without difficulty and we begin, in Section I, with a discussion of the definitional and analytical problems involved. In Section II we set out our main findings in some detail. Section III summarizes our main conclusions and, in Section IV, those conclusions are related in particular to the capitation method of remunerating doctors.

In this paper, we shall raise or suggest a number of questions and provide few, if any, answers. For this we make no apology: learning to ask the right questions is a pre-requisite of finding the right answers and, in what is largely unexplored territory, it would be

over-ambitious as well as intolerably lengthy to do more than map
out the main contours. We shall be content if we do no more than
lay down some reliable guides for future enquiry.

I

A primary requirement of an enquiry into general practice is a
definition of the population at risk. The extreme positions in this
respect are either to take, as Crawford[7] did, the patients remaining
on the doctor's list for the full period of the study (one year), or
alternatively, to include all the patients who have been on the list at
some time during the year[22, 23]. Intermediate stands are more
common. Logan's early study [32, 33] took the mean of four
quarterly totals, whilst in the later study of 106 practices[34] he
followed Fry[3] in taking the population as that at a given point in
time.

In addition, difficulties are caused by the general practitioners'
inflated lists of patients; that is, the holding of N.H.S. envelopes for
patients who are not in fact at risk; and by the task of maintaining
an up-to-the-minute list as some patients leave and others join the
practice.

Despite Logan's assurance that the possibility " of any serious
degree of inflation remaining is unlikely ", following his attempts to
bring the executive councils' and the doctors' figures into line, he
admits that one of the eight practices still had a discrepancy of
" some 300 more than the officially credited number "[32]. In Study
No. 14, Logan returns to this problem[34]. Out of the 106 practices
taking part, comparison with the executive council's lists was possible
in 96 cases, and of these the doctor's list was higher in 61 cases,
lower in 34, and the same in one case only. The doctors' count
gave a total of 359,323 patients, whilst the numbers accredited to
them by the councils was 355,568—an excess of 1.1 per cent. Follow-
ing investigations, the excess was reduced to 0.7 per cent, but seven
practices still had excesses of more than 4 per cent. It is important
to note that the numbers are unlikely to tally exactly in this study
in any case, because the executive council figure is based on the
number of patients in the practice on the ' Quarter day ', whilst
the doctors were left to make their count " over a period of time "
which may or may not have included the end of a quarter.

Aside from the problem of " inflated " lists, complications arise
from net changes in list totals during the year. Thus, in Logan[33],
the absolute increase over the four quarters of 1952/53 was 3 per cent.

McGregor[23] found that, over two years, he had 219 withdrawals and 717 additions with a total registered population of 2,562, a net increase of around 5 per cent. More detailed figures are to be found in Hopkins[16].

Crawford[7] after defending his use of only those registered throughout the period—" this procedure permits compilation of precise frequency distributions of sickness events which are of considerable value in these studies "—proceeds to contrast this definition with one based on the average number of patients registered during the year. The result is shown in table I.

TABLE I

COMPRISES THE AVERAGE NUMBER OF PATIENTS REGISTERED DURING A YEAR WITH
THE NUMBER REGISTERED FOR THE WHOLE OF A YEAR

	Average no. of patients		No. registered for whole year	
	1951	1952	1951	1952
Males	613.5	593.5	583	563
Females	855.5	826.5	801	778

Source: Crawford[7]

A similar comparison can be made in Logan[33] for 1952/53—total population based on the mean of four quarterly populations was 37,189; total population registered on the 31 March 1953 was 37,860 (ten practices).

From table II, we can see that the average doctor cared for about 1,090 patients at some time during the year for every 1,000 patients on his list at any one time.

TABLE II

{ Average rate of patients leaving practices	8 per cent
{ Range over the practices reviewed	3 per cent—18 per cent
Average increase in practices	1 per cent
Ratio between those at risk at some time, to those on the list at a certain point in time	109 : 100

Source: Logan Study No. 14[34]

Turning to the effect of changing the definition of the population at risk on consultation and other rates, only three studies supply any evidence. Brotherston and Chave[10] get a rise in consultation rate from 3.8 to 4.1 by changing the base from the total to the average

registered population. Table III makes similar comparisons for patient-consulting rates.

TABLE III

	Mean of four quarters	Total patients at risk
Patient consulting rate[32]	70.9 per cent	65.8 per cent
	'Point-time' population	
Patient consulting rate[34]	67.0 per cent	61.5 per cent

Source: Logan[32, 34]

Conversely, it may be relevant to point out that, despite a difference in base (and in the definition of a ' consultation '), the consultation rate for the first two years of Logan's Study No. 7 and 9 was 3.8, and for the 106 practices of No. 14, again 3.8. This illustrates that the apparent agreement of averages often masks real differences of definitions.

The definition of a consultation has varied from the ideal, embracing telephone calls, non-medical consultations, etc. as used by Logan in Studies 7 and 9[32, 33], Backett et al.[4] and Brotherston[10], to the actual patient-doctor contact for "significant " reasons only (e.g. Mair and Mair[6]). Some take a half-way house by including all contacts at home and in the surgery except those for non-medical reasons, but exclude indirect consultations by telephone, or via a third party[34, 12].

Illness rates can be ideally defined to include every episode of every illness[36], but in Logan[34], for each person consulting, recurring episodes of the same illness in a period (one year) count as one episode only. The base used can be either the registered population (Crawford[7]), or the number of patients consulting (Logan [32-34]). The likely difference resulting from such a change in base is illustrated in figure 1. For the purposes of our later analysis, the change in pattern (over age groups) revealed is probably more significant than the predictable variation in absolute terms.

The use of 'patients consulting' raises problems already discussed. If used as a numerator, the denominator is usually the population at risk, whilst if it becomes the denominator, the numerator is the number of consultations. Its use has certain advantages for the
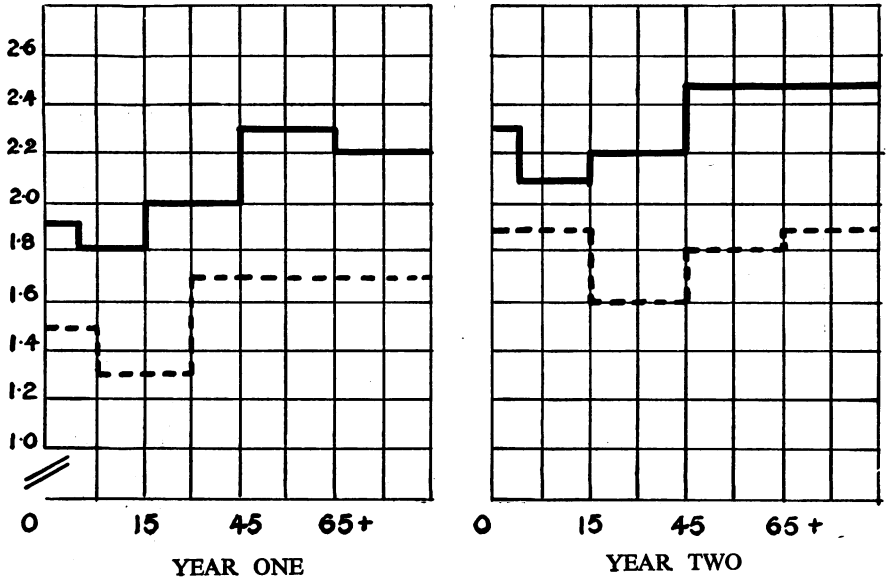
FIGURE 1.
Illness rates and age: Females only
———————illness rate per patient consulting
- - - - - - - - -illness rate per patient registered
Source: McGregor (23)

purposes of measuring morbidity, but seems to have little to recommend it as a work criterion.

Other problems of definition are less complex but none the less inhibit comparison of results. Age groups for the purposes of age distributions are variously defined as —

    0–15; 15–45; 45–65; 65+   —Logan[32]
    0–5; 5–15; 15–40; 40–60; 60+   —Crawford[7]
    0–5; 5–15; 15–25; 25–45; 45–65; 65+—Brotherston[10]

Again no agreement seems to have been reached as to what is "night" for the purposes of night calls —

    8.0 p.m.—7.0 a.m.   Fry[3]
    8.0 p.m.—8.0 a.m.   Backett[4]
    11.0 p.m.—8.0 a.m.   Brotherston[15]

When one turns to the question of the various disease categories responsible for a doctor's work, the question of presentation in the original source becomes even more crucial. For comparative purposes, the *International Classification*, with its grouping of diseases under eighteen unambiguous headings, is to be preferred. Logan and the American studies cited use this convention, whilst other studies, in the main, depart from it. The Horders[31] chose to group according

to speciality; Pemberton[1], Backett[4], Marien[20] and Davies[36] used various methods (explicit or implicit) of grouping into broad categories; whilst McGregor[22], Fry[3] and others, with varying degrees of thoroughness, listed the incidence of individual diseases. The least helpful approach for comparative purposes was to rank the twenty or so most frequent complaints to the exclusion of all others, thereby inhibiting the construction of accurate group frequencies completely.

Vague definitions present further problems. For example, to define the population at risk as " over 12,000 " (Davies[36]) leaves too much for the reader to gather from the material by inference. More generally, out of the 37 studies reviewed, only eight definitions of a consultation, which left no room for doubt, were encountered. The typical approach was to regard the concept as in need of no explanation.

The last general problem is one of interpretation. Any judgement as to consistency in ' work rates ' must depend upon what variation is considered as significant. No easy answer to this is available but, with few exceptions, the possible consultation rate in practice lies between the narrow absolute limits of two and eight per person. Given a practice with 2,000 patients, in which the doctor devotes ten minutes to every consultation and takes two weeks holiday a year, a consultation rate of —

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2.0 means working a 14 hour week
3.0   ,,      ,,      ,, 20  ,,   ,,
4.0   ,,      ,,      ,, 27  ,,   ,,
5.0   ,,      ,,      ,, 34  ,,   ,,
6.0   ,,      ,,      ,, 40  ,,   ,,
7.0   ,,      ,,      ,, 47  ,,   ,,
8.0   ,,      ,,      ,, 54  ,,   ,,
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This simple chart is of course, purely illustrative and takes no account, for example, of travelling time. Its purpose is to make the obvious but frequently forgotten point that, other things being equal, a consultation rate of 6· means double the work of a consultation rate of 3. Any rule here must be arbitrary but we suggest that variations in excess of ± 0.5 in consultation rates are worthy of note.

With these precautionary reflections in mind, we can now turn to the findings of our survey.

II

Percentage of list seen

Perhaps the easiest statistic to derive once an enquiry has been completed is the percentage of the doctor's total list who have seen

the doctor at least once during the year of the study.

The range over the studies reviewed is large, varying from 50 per cent to 85 per cent. Even in one survey of eight practices during a single year[32], the percentages vary from 58.3 to 80.0 per cent which, other things being equal, must represent a considerable variation in work.

The point may be put another way. Just over half of all practices saw 60-70 per cent of their lists during the year surveyed, but two-fifths had over 70 per cent of patients reporting during the year and a number of practices (10 per cent) saw over 80 per cent of their lists. (See table XIII, p. 428).

For periods of longer than one year, little information is available. Fry[5] found that he saw 91 per cent of his list over the course of five years, whilst Reid Ross[21], in a sample survey of an industrial town, gave a figure of 86.8 per cent for approximately four years. No information is available on the number of times that the same individual patient saw the doctor over a number of years, i.e. on the problem of " repeaters ".

Consultation Rates*

The consultation rate is probably the most obvious indication of a doctor's work and is expressly stated in, or easily derived from, twenty three of the studies under review. The rates encountered range from 2.7 to 9.2, both these extremes being found in Logan's surveys. The 9.2 is not, however, for any particular practice but is found in Study No. 14 as the rate for rural S.W. England. This figure is, furthermore, based on a restrictive definition of a consultation—that is, one excluding all consultations but those for medical reasons involving actual contact in the surgery or home. As if to point the contrast, the 2.7 (Practice No. 10, Study No. 9[33]) is based upon an ideal, all embracing, definition.

The highest rates among the single practice enquiries are recorded by Scott in two studies of the Edinburgh Teaching Unit[37, 13], these being 7.2 and 6.6. The nearest rival to these figures is the 6.3 found by Mair and Mair[6] in the fourth year of their five-year study. Again it is surprising to discover that Mair and Mair's high figure is based upon a definition which excludes those consultations requiring " a word or two of advice, a trivial dressing or reassurance "—a significant number if other accounts are any guide. For example, Davies[36], out of a total of 11,350 items of service, accounts for 4,000

* Rates expressed per head of practice population unless otherwise stated.

of them in terms of telephone calls, certificates, etc., leaving only 7,343 medical consultations and visits.

Fry[5] in a similar practice location, whilst including all patient-doctor contacts at home, surgery, and hospital, has a range over five years of only 3.1 to 3.5 compared with Mair and Mair's 4.5 to 6.3 It is also interesting to note that the contrast in consultation rates between the two studies is reversed in the case of the percentages of their lists seen—Fry being consistently 10–27 per cent higher. This of course means that the contrast in consultation rates per patient consulting between the two studies is even greater.

The annual variation within one practice, with one exception, never exceeds ' one ', but not unexpectedly the range within any one survey is large. The first Logan Survey has a range of 2.7 to 5.0 over its ten practices[32 and 33], whilst the sample surveys yield figures range from 3.7 to 5.4

Female rates over the studies are consistently above those for men.

No consistent pattern seems to emerge from comparing the consultation rates with the size of the practice population upon which it is based. Logan's practices No. 4 and 5[32] have virtually identical populations (a difference of six persons), both are rural in location and both are run by a single practitioner, but they have consultation rates of 3.5 and 4.5 respectively. It is very difficult to make anything but a passing reference to this point due to the problem of allowing for assistants, trainees and occasional helpers.

Half of the studies under review have a consultation rate of between 3.0 and 4.0 per person; thus half the studies fall outside our range of significance (± 0.5). Figure 2 illustrates the distribution, which is heavily skewed, 6 per cent being below and 45 per cent above, these modal frequencies (3.0–4.0). (See also table XIII, p. 428.)

Also in figure 2, is a similar distribution for persons over 65 years of age. Although age distributions are dealt with later, it is convenient to point the contrast here. Not unexpectedly, the rates are higher, although with considerable overlap between the two distributions, showing that whilst the range in absolute terms for age groups is large, it is still possible for the 65 + figures of one practice to be considerably below the consultation rate for all persons, of another.
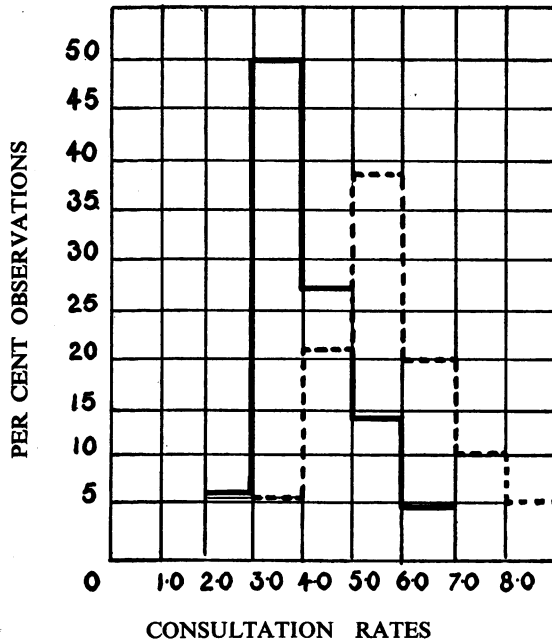
CONSULTATION RATES

FIGURE 2
Percentage distribution of consultation rates found

———————consultation rate per person
··········· consultation rate per person over 65 years

The 65+ distribution has been constructed from distributions
for males and females by means of a simple arithmetic average

Home visits

Having assessed the population, calculated the percentage seen
and the consultation rate, it is obvious that little can be said about
the extent of the doctor's work without allowing for the percentage
of these consultations which took place outside the doctor's surgery,
thus involving him in the extra time and effort of travelling.

The immediate impression upon considering home visits as a
percentage of total consultations is the very wide range encountered.
The range in the studies under review is from 12.0 to 68.2 per cent.
Indeed the range within the first year of Logan's Survey No. 7[32]
is from 13.1 to 43.6 per cent over only eight practices, although the
means for that, and the two following years, were 27.0, 28.6, and
26.8 per cent respectively.

Just under 40 per cent of the practices reviewed had between
20–29 per cent of their consultations in the patients' homes. Eleven

per cent had percentages below this range, 50 per cent above it. Twenty per cent of them had over half their consultations outside the surgery (see table XIII, p. 428).

As there is no information on the percentages experienced by individual practices in the last two years of Logan's first survey[33], the only evidence on annual variations within one practice is found in—Mair and Mair (26.4 to 63.2 per cent over five years); Crawford (44.4 to 47.4 per cent over two years); McGregor (53.3 to 59.8 per cent over two years); and Hopkins (22.7 to 24.2 per cent over three years).

With the exception of Crawford[7], females were found to have a higher percentage of home visits than men. As would be expected, the two American studies[27, 25] give very low figures — 2.0 and 10.0 per cent respectively.

A constant consultation rate for a practice over a period of time may conceal variations in a doctor's work due to changes in the proportion of his consultations taking place in the home. The evidence is at the moment far too limited for generalization but suggests variations may be significant. Certainly the variations between practices must be considered important when one practice is found to have one consultation in every ten in the home, and another seven in every ten.

Urban-rural contrast?

When considering mean rather than actual rates, it was thought more convenient to group the figures according to the type of location of the practice—urban, semi-urban, and rural. The result is shown in table IV. The range and means are surprisingly similar and certainly do not point to any general urban-rural contrast.

It is worth noting that Logan's Study No. 14[34] of 106 practices arrived at consultation rates of 3.8 for urban, 3.7 for semi-urban and 3.6 for rural practices—clearly not significant differences.

The only variations between the groupings in table IV worthy of comment are those for home visits. The means show a difference of 10.9 per cent between the urban and rural practices but the ranges are similar and the smallness of the number of observations (nine for ' rural ') makes any generalization dubious.

The general conclusion would seem to be that the variations from practice to practice within each grouping are large but that there are no distinctive variations between the groupings themselves.

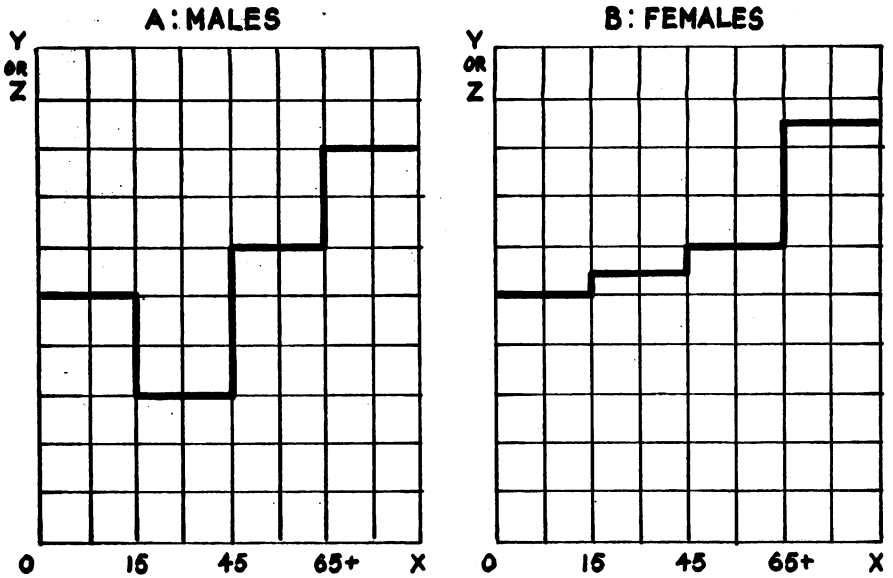A: MALES   B: FEMALES

FIGURE 3(1).   Basic patterns for age, and sex distributions

X + Age
Y + Consultation rate per person
Z + Per cent of each age group consulting " n " times
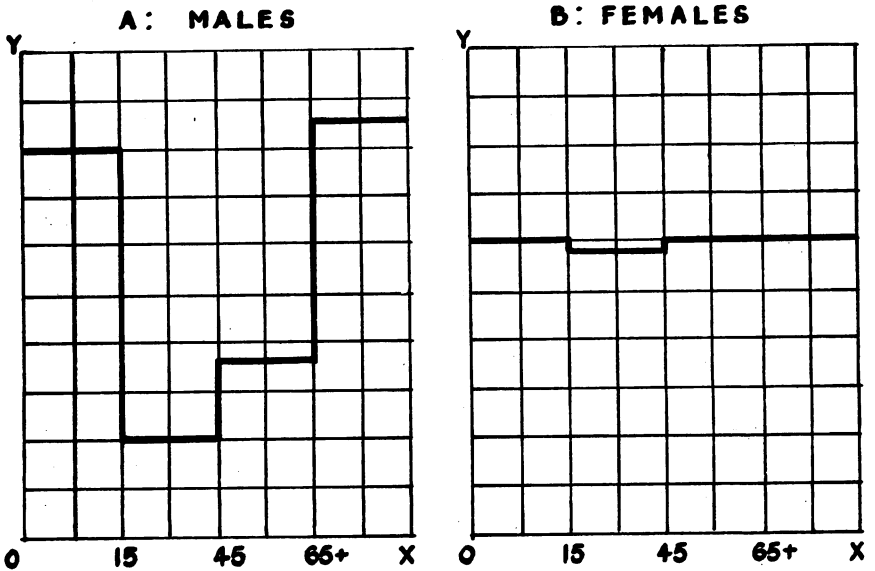
A: MALES   B: FEMALES

FIGURE 3(2).

X + Age
Y + Percentage of each age group's consultations which take place at home
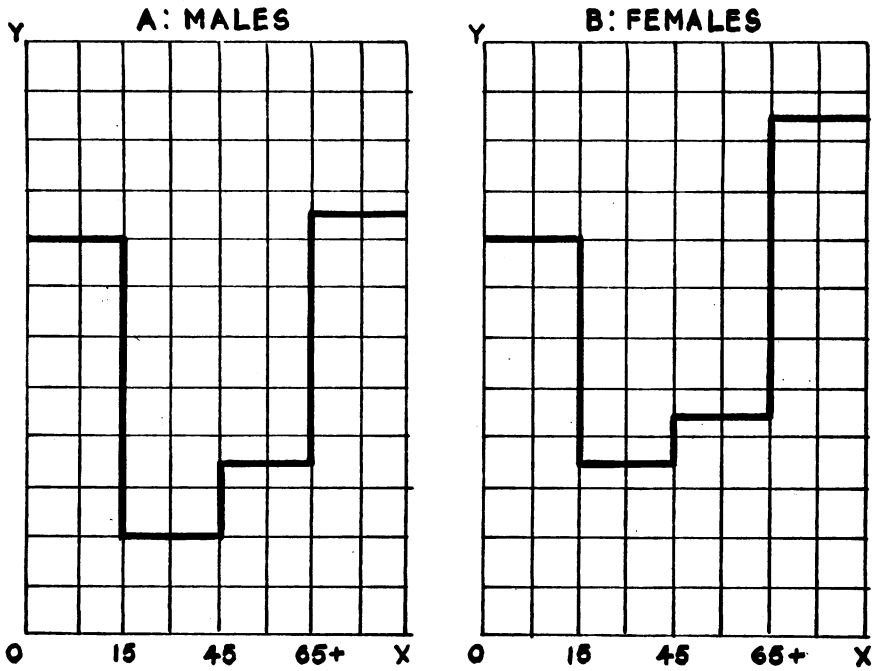
FIGURE 3(3).

X + Age
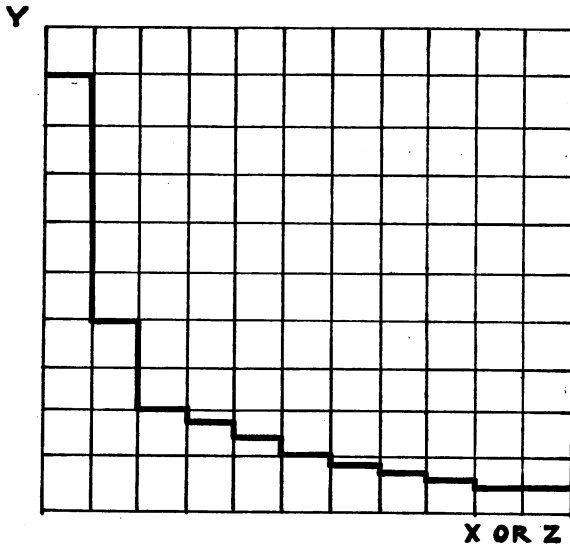Y + Illness rates (registered population)

FIGURE 3(4).

Y + Per cent of persons
X + Number of consultations
Z + Number of illnesses

TABLE IV

Grouping of practices by type of location: all studies

	Percent list seen			Cons. rate			Percent home visits		
	High	Low	Mean	High	Low	Mean	High	Low	Mean
Rural	81.3	58.3	68.1	9.2	2.7	4.2	68.2	16.0	43.4
Semi-urban	74.1	60.5	67.5	5.9	2.7	4.0	59.8	53.3	55.0
Urban	86.8	50.1	69.1	7.2	2.9	4.0	63.2	13.1	32.5

Notes: 1. Home visit means are based on under ten observations
2. Reference [27] has been omitted
3. The regions in [34] have been counted as separate studies for this chart

Age-distributions

Having briefly described the basic rates which emerge, it is necessary to turn to consider whether any consistent age distributions are present. Certain statistical licence becomes necessary to make headway due, for example, to different studies taking different age groupings.

In preparing this survey, we first plotted the actual material graphically but found the result unsatisfactory due to the number of studies, and variations in the classification of the original material. Certain basic patterns emerged but tended to be obscured when presented in that way. As a solution, we have extracted these basic patterns and, in figure 3, show them in a representational form.

1. *Consultation rate per person—age and sex.*

All the Logan Surveys[32-35] reveal a pattern which closely follows 1A and 1B in figure 3. The male distribution is characterized by a dip in consultation rate for the 15–45 age group, whilst the female distribution corresponds to a step-ladder, with a minimum figure in the 0–5's and a maximum in the over 65's. Thus there is a marked divergence in rate and trend between the two sexes in the 15–45 year old age groups.

As the Social Survey[35] excludes the 0–15 year olds from considera-tion, it is not possible to ascertain whether the male 'dip' is present, but the distribution makes it appear not unlikely, particularly as the 15–45 group still has the widest male-female divergences. In the other studies, the female distributions tend to be more variable in pattern and, whilst the general upward trend is discernable, a dip

comparable with that for the males is often evident. Some studies ([7, 10, 35, 5] in the very young and, uncommonly, in [32, 33]) show higher rates for males in the extreme age groups, but mostly the female distributions lie above the male.

When one comes to consider absolute figures rather than patterns and trends, the degree of consistency diminishes considerably. Table V illustrates the range of consultation rates for each age group found in the first Logan Survey[32, 33]. Table VI shows the range over three years of one practice from this survey.

TABLE V

CONSULTATION RATES: EXTREME RANGES

Age	0—		15—		45—		65+	
Sex	M	F	M	F	M	F	M	F
Highest	4.3	4.3	3.5	5.2	5.6	6.2	6.7	9.6
Lowest	2.1	2.1	1.9	2.8	2.4	3.0	3.6	4.1

Source: Logan [32, 33]—all practices

TABLE VI

CONSULTATION RATES: EXTREME RANGES FOR ONE PRACTICE OVER 3 YEARS

Age	0—		15—		45—		65+	
Sex	M	F	M	F	M	F	M	F
Highest	4.1	4.3	3.5	5.0	5.4	6.2	5.8	8.1
Lowest	3.9	3.8	2.8	4.7	5.1	4.8	4.6	6.9

Source: Logan [32, 33], Practice No. 1

The most striking variation in consultation rate is found in the 65 + groups, although all groups have a range in the region of 2.0 plus, the range tending to increases with ascending age. This, of course, under the terms of our hypothetical table, is a range upwards of thirteen hours work a week.

Logan's practice No. 7[33] has a rate of 7.0 for men and 9.6 for women in the 65 + groups, whilst practice No. 3 for the same survey and year records the figures 3.9 and 4.4 respectively (the means for all practices were 5.0 and 6.0 respectively). The other surveys tend to widen the extremes found, Backett[4] and Brotherston[10] have

male rates of 8.2 and 8.7 respectively, whilst Watts[19] has a rate of
13.2 for both sexes combined in this age group, and Scott and McVie
have a corresponding rate of 12.2.

The 45–65 group has large variations as well. In practice No. 1
(table VI), the male and female rates are 5.4 and 6.2 respectively,
whilst for the same year and survey, practice No. 6 has the figures
2.8 and 3.0. Again the other studies add to the range encountered
e.g. Scott and McVie have a figure of 7.4 for persons 45–65 years
old.

The annual variation for the 65 + group is illustrated by the
Social Survey[35] with ranges of 5.3 to 7.3 for males, 65–75, over five
years of inquiry, and 6.1 to 8.9 for those over 75 years. Fry[18], also
over five years, has ranges of 5.5. to 7.0 for the 70–80 group, and
6.2 to 7.7 for persons over 80.

2. *Frequency of consultation—age and sex.*

The same two basic patterns (figure 3, 1A and 1B) emerge when
considering the age distributions of those patients consulting more
than ten times, and of those consulting more than five times. The
only breaks with the expected trend are found in Backett[4] and
Crawford[7], where the female distributions have the same ' dip ' as
the male. The female percentages exceed the corresponding male
figures, with an occasional exception in the extreme age groups.

Worthy of note is the very large annual variation in Crawford's
study[7]—the 5–15 males change from 26.9 to 41.8 per cent, and the
0–5 females from 45.8 to 31.0 per cent in the distribution of those
consulting more than five times.

When we turn to the percentage distribution of those not con-
sulting at all, we would expect a ' bump ' in the distribution for men
in the 15–45 group, and despite widely differing absolute percentages,
this is largely true. A bump also occurs in the female distributions
in the 45–65 age group, except in the March quarter of Logan's
1951–52 Survey (this being the only information given in [32]) where
the female distribution exactly mirrors the male.

The smallness of the number of observations under each heading
makes comment on the absolute ranges difficult (only three to four
observations for any given number of consultations). Differences
between the highest and lowest percentages for each age group
range from 35.4 per cent (male 5–15) to 3.6 per cent (male 0–15)
for those not consulting, and from 18.2 per cent (females 45–65) to
1.4 per cent (males 65 +), for those consulting more than ten times.

3. *Home visits as a percentage of each age group's consultations.*

Once again a consistent pattern is observed from the studies (corresponding to figure 3, 2A and 2B), whilst a very large absolute variation in percentage is present for each specific age group.

The 15–45 ' dip ' is found in both the male and female distributions, being very pronounced indeed. In the case of all three Logan Studies[32, 33, 34] the difference between this age group and the 0–15's is in the region of 20 per cent for both sexes. Backett[4] has a male drop of 26 per cent, and a female one of 24 per cent (these differences are the absolute change in two percentages derived by subtracting one from the other).

The 0–5 group tends to have a lower percentage than the 5–15's in all studies except McGregor's[23] second year. In the first year of that study the female distribution corresponds to pattern 1B (figure 3), being the typical step-ladder found in the female consultation rate distributions. The first year of Crawford's study[7] also breaks trend in that the 40–60 female group has a lower percentage of home visits than the preceding age group.

With two main exceptions[7, 29] the female percentages are above the corresponding male, with some inconsistencies at the extreme age groups.

Turning to the range of figures in any one age group, the spread is found to be large, with no observable tendency to find a level. The annual variation within one practice or survey is substantial, although much less than that found from practice to practice. The annual variation can be seen in Logan[32 and 33], Crawford[7] and McGregor[23]. It must be remembered that the figures in the Logan Survey are means of the experience of ten practices and are, therefore, to be expected to display less variation. In only two instances do these variations amount to a break in trend. Two examples of annual variations are given in table VII.

TABLE VII

PERCENTAGE HOME VISITS IN EACH AGE GROUPS' TOTAL CONSULTATIONS: SELECTED STUDIES

Age	0–5	5–15	15–40		0–5	5–15	15–45
Males—Year 1	50.3	67.3	36.4	Males—Year 1	44.1	63.7	24.9
Year 2	60.8	65.5	26.7	Year 2	67.6	65.0	31.9

Source: Crawford[7]   *Source:* McGregor[23]

As in the case of total consultation rates, the most striking variation between studies occurs in the 65 + group, although the 45–65 group has a range in excess of 32 per cent for each sex (table VIII).

TABLE VIII

PERCENTAGE HOME VISITS IN EACH AGE GROUP'S TOTAL CONSULTATIONS: ALL STUDIES

Age	0–5	0–15	5–15	15–45	45–65	65+
Male—Highest	67.6	46.0	67.3	31.9	53.4	76.2
Lowest	40.5	34.9	62.3	13.6	20.8	33.5
Difference	27.1	11.1	5.0	28.3	32.6	42.7
Female—Highest	78.7	53.0	62.7	49.9	55.9	85.9
Lowest	36.9	35.3	43.1	18.9	21.7	47.0
Difference	41.8	17.7	19.6	31.0	34.2	38.9

Note: Excludes Crawford[7], ages 15–40, 40–60 and 60+.

4.   Illness rates—age and sex distribution.

The rates tend to be small in range both between age groups, and between studies. When expressed in terms of patients consulting rather than registered population, the rates do become rather more irregular, e.g. Brotherston[10].

The male pattern is shown in figure 3, 3A (which is identical to 2A), whilst the female distribution is very flat displaying little variation with age. In fact, Logan's Study No. 14[34] yields a completely horizontal, female distribution (at an illness rate of 2.1) and most observations have the same rate for the 45 + groups (figure 3, 3B).

5.   Miscellaneous.

The most uniform distributions are those which correspond to the ' L ' shaped curve illustrated in figure 3 (4). Both the " percentage of persons consulting a given number of times ", and the " percentage of persons with a given number of illnesses ", fall into this category. The variation between the studies for these distributions both in pattern and in absolute figures is very small indeed. Both fall sharply in the low numbers of illnesses/consultations, usually having a male preponderance here.

Disease groupings

The pattern of demand for a doctor's services, as evidenced by consultation rates for broad disease groupings, is shown in table IX.

Logan's study of 106 practices[34] is the most extensive and forms the basis of the ranking of disease groups.

It can be seen that his earlier study,[33] although limited to fewer

TABLE IX

CONSULTATION RATES PER 1,000 PRACTICE POPULATION
AVERAGE OF TWO YEARS

Disease group	Practice number								Mean of 8 practices
	1	2	3	4	5	7	8	9	
1. Respiratory	1,642	1,066	967	942	900	594	676	846	954
2. Nervous and sense systems	374	376	283	301	487	256	282	333	337
3. Symptoms, senility and ill-defined	237	304	230	177	293	446	472	234	299
4. Digestive	364	371	343	285	414	195	261	294	316
5. Skin and cellular tissue	318	219	252	346	384	314	204	316	294
6. Circulatory	340	260	183	332	439	211	331	279	297
7. Bones and organs of movement	343	330	201	209	376	177	190	235	258
8. Accidents	182	137	171	291	311	188	179	160	202
9. Non-sickness	168	54	61	401	377	268	254	153	217
10. Infective and para-sitic	312	165	142	217	152	283	261	182	214
11. Genito-urinary	167	119	122	99	268	92	271	140	160
12. Mental	134	134	94	121	242	87	100	218	141
13. Allergic, endocrine, metabolic and nutrition	163	180	166	118	213	135	142	113	154
14. Neoplasms	103	30	20	45	69	22	62	19	46
15. Blood and blood forming organs	64	29	16	48	63	34	39	32	41
16. Congenital malformations	4	1	4	15	7	5	3	5	5
17. Diseases of early infancy	9	1	2	6	2	6	12	3	5
Total consultation rate	4.4	3.6	3.1	3.8	4.5	3.2	3.6	3.5	3.9

Source: Logan[33]. Practices 6 and 10 are excluded as they have only one year's experience recorded.
Note: Diseases ranked and grouped according to Logan.[34]

than ten practices, nevertheless reveals a very similar order of ranking, which would seem to suggest that a significant uniformity in demand pattern has been detected. But when we move away from the mean experience of a number of practices to the actual experience of individual practices, important disparaties emerge. Respiratory

diseases are consistently ranked first for each practice but the proportion of total consultation rates made up by these diseases varies widely between practices—a range of 18 per cent to 37 per cent. Looking down the columns, the rankings of disease groupings vary between practices but are not completely disorderly. There is, for example, a marked tendency for nervous and digestive complaints to appear in the second and third places. But again, this tells us nothing about the associated consultation rates. Looking now across the columns, these are seen to vary widely between practices. In other words, as with other material we have classified and analysed, there is a tendency for a pattern to emerge, though here it is less marked, but the ranges of absolute rates found are very large.

We attempted to combine the findings of a large number of studies on disease incidence but incomplete material and the use of dissimilar definitions and classifications made it impossible to arrive at conclusions in which any confidence could be placed. Perhaps the one noteworthy feature was that respiratory diseases were ranked first in all the studies but one.

Time and miscellaneous

There are other aspects of a doctor's work that must be dealt with briefly, not because they are unimportant, but because so little work has yet been done on them.

The outstanding example is time. The only attempts at a thorough study that we have been able to find are those by Wood[30], and Crombie and Cross[11]. A summary of Wood's findings for an average day is given in table X. He found that his time per surgery consultation ranged between 2 and 35 minutes, whilst for home visits the extremes were 2 to 60 minutes. Crombie and Cross, among other results, found the time spent on each patient in a year to be 21 minutes, whilst visits consumed an additional 5.2 minutes travelling time per visit. Other observations are few and far between and arise incidentally. Fry[3] found each patient took 5 minutes in the surgery and between 10 and 15 minutes for a visit, whilst Watts[19] has the corresponding figures of 7.2 and 11 minutes. Mair and Mair[6] derive the figures 8.8 and 8.3 minutes per item of service in consecutive years.

The annual mileage covered by a doctor is variously put at 15,000, 14,000, 8,784 and 8,000 miles by McGregor, Fry, Watts, and Crawford respectively.

On the question of night calls (see M. B. Clyne, *Night Calls*,

Tavistock Publications 1961) little comment is possible beyond saying that the range seems very great. (Table XI).

TABLE X

THE PROPORTIONATE DISTRIBUTION OF A DOCTOR'S TIME

Surgery	14 per cent	8.34 mins. per consultation
Visits	41 per cent	12.3 mins. per consultation
Driving	19 per cent	40.8 miles per day
Dispensing	8 per cent	44 mins. per day
Writing	18 per cent	108 mins. per day
Total	100 per cent	626 mins. per day

Note: based on one day in an average seven day week.

Source: Wood[30]

TABLE XI

NIGHT CALLS PER 1,000 PATIENTS

Reference number	(3)	(4)	(10)	(15)	McVie*
8.0 p.m.—7.0 a.m.	25	—	—	—	—
8.0 p.m.—8.0 a.m.	—	39	19	—	84
Midnight—8.0 a.m.	—	—	—	12	25
11.0 p.m.—8.0 a.m.	—	—	—	17	—

*quoted in 15

The early Logan Survey[32, 33] has a large range of referral rates and a sizeable annual variation within the same practice. (Table XII). The second survey[34] has figures for hospital admissions only (11 per 1,000 consultations), leaving the 35, 31 and 23 per 100 persons found by Backett[4], Brotherston[10], and Crawford[7] respectively, the only comparable figures.

TABLE XII

REFERRAL RATES PER 100 PRACTICE POPULATION

Practice No.	1	2	3	4	5	6	7	8	9
Year 1	16.1	6.4	19.0	14.3	32.1	9.5	17.8	14.5	—
Year 2	12.8	5.9	19.7	21.0	31.7	11.7	11.1	12.8	25.2

Source: Logan[32, 33]

III

The difficulties have been discussed and the body of evidence surveyed. What general conclusions emerge?

There are wide variations as between practices in the percentage of the doctor's list seen, in consultation rates per person, and in the percentage of home visits. Further, and more tentatively, it may be that the annual variation of these figures within one practice is significant. Only the *patterns of distribution* of the figures over age groups and between the sexes are consistent and predictable. The *general level* of the patterns, on the other hand, is highly variable.

Table XIII shows the percentage distribution of the basic rates found in the studies under review. The number of practices or groups of practices, to which the percentages refer, is of course larger than the number of studies themselves, and varies approximately between fifty for home visits and a hundred for consultation rates.

TABLE XIII

Percentage of total list seen	Percentage practices	Consultation rates per person	Percentage practices	Percentage H.V. to T.C.	Percentage practices
50–59	6	2.0–2.9	6	0–9	2
60–69	53	3.0–3.9	50	10–19	9
70–79	30	4.0–4.9	27	20–29	39
80–89	10	5.0–5.9	14	30–39	14
		6.0+	4	40–49	16
				50–59	11
				60+	9

Notes: (i) H.V. is short for " home visits " and T.C. for " total consultations "
(ii) Percentages of practices do not necessarily add to 100 due to rounding

Over four-fifths of practices see between 60 and 80 per cent of patients on their lists in a year. As the maximum range observed is from 50 to 90 per cent, this result is not surprising. Its relevance for the doctor's work is two-fold. First, a doctor seeing 80 per cent ot patients in a year would, other things being equal, do one-third more work than a doctors seeing 60 per cent—a not inconsiderable difference. Secondly, even if the 60 to 80 per cent band were used as a rough and ready guide, nearly 20 per cent of practices would still fall outside it—a not inconsiderable proportion.

Turning now to consultation rates, the indication is that a practice

has no more than an even chance of a consultation rate of between 3.0 and 3.9. Of the practices under review, nine-tenths had a consultation rate of between 3.0 and 6.0, which, with a maximum range observed from 2.7 to 9.2, is not altogether unexpected. From the point of view of work, the result is of limited value: we repeat our simple but often overlooked arithmetical point that, other things being equal, a consultation rate of 6 means double the work of a consultation rate of 3. Further, the dispersion of rates would almost certainly be wider if due allowance were made for the varying definitions of a consultation. This follows from the fact that the most restrictive definitions have been found in studies with high rates, whilst they have been broadest at the lower end of the range. And table XIII tends to exaggerate the degree of uniformity for other reasons, the main ones being the inclusion of figures from the 106 practices of Logan's study No. 14 which, as they are stated in a regionalized form, do not express individual practice variations at all; the inclusion of different years of the same study; and the inclusion of mean figures which have averaged out the variations found, as in Bradford Hill.

Finally, in observations on table XIII, the percentage of home visits shows a very wide dispersion indeed. Thus, even if the total consultation rate varied little as between practices, account would need to be taken of the widely differing proportions of home and surgery visits that made up that rate.

A fairly clear sex contrast within practices does emerge from the studies. Women tend to have higher consultation rates, higher percentages of home visits, and to have more illnesses than men. They also have larger percentages of their number consulting a large number of times a year, and having a large number of illnesses.

Due mainly to the use of dissimilar definitions and classifications, no reliable conclusions can be drawn from the whole body of material surveyed on disease and the individual general practice. Logan's study No. 9 suggests two broad results[6] a general, rather loose, pattern in the ranking of disease groupings and a wide variation as between practices in the consultation rates associated with each grouping. A study confined to eight practices is obviously too small for generalization. It seems to us curious that there is so little systematic information about the pattern of demand, morbidity-wise, facing the individual general practice and of the levels of demand within that pattern.

There are, however, we believe, enough observations to establish patterns related to age groups that are consistent from practice to practice. This consistency may be thought surprising in view of the wide variability, already noted, in absolute levels as between practices.

Overall, the patterns for *consultation rates* take the form of a step-ladder for females and a step-ladder, broken by a dip in the 15–45 age-group for males. Thus the two patterns have a marked tendency to diverge sharply in the 15–45 age-group. Both distributtions reach a maximum in the 65 plus group.

Turning to the other distributions illustrated in figure 3, it can be seen that, for *home visit ratios*, the male and female patterns are essentially similar. Both now have the 15–45 " dip " feature, although it is now continued, by means of a small step, into the 45–64 age-group. As regards *illness rates*, the surprising discovery is that, for females, they do not vary with age. There is a slight " dip " in the 15–45 age-group but the essential pattern can be represented by a horizontal straight line. This is in marked contrast to illness rates for males, which follow a similar pattern to the home visits distribution.

The range in total rates expressed for practice populations as a whole is naturally reflected in the ranges encountered for any specific age group. The large range in the consultation rate in the 65 plus groups is of special interest. A summary of results from the studies under review is given in table XIV. The number of observations on which it is based is approximately fifty.

TABLE XIV

MALES AND FEMALES OVER 65 YEARS OLD

| Consultation rate | Percentage of practices | |
	Male	Female
3.0–3.9	11	0
4.0–4.9	27	16
5.0–5.9	34	41
6.0–6.9	18	20
7.0–7.9	5	16
8.0+	5	7

It must surely be of significance to students of social medicine generally, and not only those interested in the doctor's work, to

explain these large variations from practice to practice in the consulting habits of old people.

The evidence we have considered does not suggest a general urban-rural contrast of general practitioner experience. The means and ranges of the various rates are similar for practices in both groups. It is significant that the Royal Commission on Doctor's Pay found that the additional recompense and higher expense allowance to rural doctors had been overdone. (*Report*, para. 342.).

Finally, we find that regrettably little work has been done on the use of a doctor's time.

IV

Two main conclusions have now been reached. First, that certain clear age and sex *patterns* are identifiable, both for individual practices and for groups of practices; but that, secondly, variations in the *absolute level* of the patterns as between practices are too large to permit useful generalizations about a doctor's work to be made. We must now, briefly, indicate the relevance of these conclusions for contemporary problems and emphasize the need for further enquiry.

The conclusions apply, most importantly, to the capitation method of remunerating doctors, under which a doctor's work is measured simply by the number of patients on his list. Now whatever the merits of the capitation system (and they are real enough), there would be general agreement that it establishes no more than a tenuous link between *quality* of effort and monetary reward; at best, it " does nothing *positively* to foster higher standards of performance and care of the part on the general practitioner and to that degree is failing to satisfy one of the critical tests of any good system of remuneration ".* The wide variations in consultation rates and home visit percentages disclosed by, and implied in, this survey are vivid indications of the crudeness with which the capitation system operates in determining relative incomes within general practice.

Nor, as is sometimes supposed, would these inequalities necessarily be mitigated by modifying the flat capitation rate to take account of the age structure of practice populations. It is invariably true, *for each practice taken individually*, that the average person over 65 consumes more of a doctor's services than the average

*Professor John Jewkes, *Minority Report, Royal Commission on Doctors' and Dentists' Remuneration, 1957-1960*, para. 74 (italics in the original).

person under 65, but, as we have shown, that is by no means invariably true *as between practices*. In fact, there is a considerable overlap, with people under 65 in some practices having *higher* consultation rates than people over 65 in other practices. Practices with a low average consultation rate could well gain more than those with a high average consultation rate. Even if that were not so, the results of an additional *per capita* payment for patients over 65 would be far from satisfactory. Let us suppose that payment to be ten shillings. Taking the extreme consultation rates found in this survey, this would mean a range of additional income per consultation in this age-group of between ninepence and half-a-crown. Proposals of this kind have so far been based solely on age-patterns of demand for the doctor's services. It is now clear that serious account must also be taken of the large differences that exist in the absolute level of those patterns as between practices.

Up to now, we have implicitly taken the consultation rate as the index of a doctor's work. The consultation rate is without doubt central to the concept of work and formed the basis of the most thorough and statistically valid study yet undertaken—that by Bradford Hill. But it needs to be refined to take account of at least four factors.

(1) the proportion of home visits to total consultations. Two identical consultation rates may conceal wide variations. in that proportion and thus in the amount of work involved. The very limited evidence suggests that a home consultation takes between two and three times as long as a surgery consultation.

(2) the length of time per consultation, abstracting from time spent travelling on home visits. If that varies inversely with the consultation rate, then the consultation rate, taken by itself, will over-state variations in work done. There is not enough evidence even to speculate on whether this is so or not.

(3) the efficiency of diagnosis and treatment. Some doctors may be more efficient, in this sense, than others and may, therefore, be able to achieve given results with fewer consultations. Here, there is no evidence at all.

(4) the efficiency of organizaton of the practice. Some doctors may make more effective use of their skills than others by employing auxiliaries, among other means, and thus be in a position to have more consultations or to spend more time with each patient. On this point, the evidence is sparse, scrappy, and inconclusive.

Thus, taking the consultation rate as the index, we are left with

the firm impression that the amount of work done for a given income
varies widely between practices; and there is virtually no information
with which to qualify that result. With the National Health Service
entering its fifteenth year, this is an extraordinary situation. As
regards the fixing of pay, relations between government and the
medical profession since 1948 have, to say the very least, been far
from happy. Discord has tended to centre on a fair and reasonable
average income for the general practitioner, in the light of past
experience and the trend of incomes in other professions. But that
average is a fiction and the methods of distributing whatever total
sum has been negotiated have given rise to discontent within the
profession. The facts disclosed by this survey confirm that this
discontent is well founded. Indeed, it may well be the very lack of
knowledge of the relationship between work and income that has
enabled the capitation system to survive unmodified for so long.
The Royal Commission on Doctor's Pay were unhappy about its
distributive consequences, though they did not feel competent to
do more than express the hope that " where practical, greater weight
will be given in the scheme of distribution to items other than capita-
tion ... in order to mitigate to some extent the preponderant
influence of list size as a determinant of earnings ". (para. 342).
Our findings suggest that the need for reform is obvious and more
urgent than has been supposed heretofore. The information on
which reform must be based does not exist. Systematic enquiry
into doctors' work is equally obvious and urgent if the hope of the
Royal Commission is to become reality.

For the most part, facts about work have emerged as a by-product
of the studies surveyed; only rarely, as in the Bradford Hill study,
has measurement of work been a central theme. And the present
trend of research into general practice is heavily in favour of the
measurement of morbidity. Of course, morbidity studies have value
in their own right and they throw up information that has important
bearing on a doctor's work. But their methods of approach and their
definitions are inappropriate for work study. Thus, if we take
Logan No. 14 as an example, the general practitioner is used as a
means to build up a picture of sickness in regions and in the com-
munity as a whole, but he is not essential to that purpose; if some
more effective means could be found of achieving the same end, he
could be dispensed with. Furthermore, the information recorded by
the general practitioner is analysed independently of individual
practices: the means and other measures that are worked out are

not means of individual practices but of the information, taken as a whole, that individual practices have recorded. The individual practice, as it were, withdraws from the scene when the recording is complete. Now, by contrast, the basic unit in work study *is the individual practice*. Put another way, morbidity studies are patient-oriented, whereas work studies must be general-practitioner-oriented.

On matters of definition, we can again refer to Logan No. 14. In that study, a consultation is defined, quite rightly, to exclude all items of service not directly relevant to the recording of morbidity. On the other hand, a definition for purposes of work study would, ideally, include all items of service. Again in that study, no distinction was made, or needed to be made, between surgery and home visits,whereas in work study, such a distinction would be fundamental.

To discuss possible lines of approach for future research would take us too far afield and we must confine ourselves to one observation. It is that mean figures for groups of practices will serve little useful purpose. A major fact to be explained is why practices vary so greatly and the mean is a device for ironing out those variations. It may be that the most hopeful initial approach would be to take a large number of practices in one area and subject them to intensive investigation.

However that may be, we would end with a plea to workers in this field to publish future findings in a form which lends itself readily to general comparison. Our own survey demonstrates beyond any doubt the serious difficulties that confront anyone who tries to shape general hypotheses from the mass of material that has accumulated since 1945 and to which additions are continually made. Surely there would be agreement that results should be presented, not in a vacuum, but so as to follow or contribute to the main stream of knowledge that has gone before. One of the decisive steps would be for investigators to make up their minds at the outset on whether they are studying work or morbidity. Little but confusion can come from attempting both at the same time.

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Vital Statistics of the National Health Service

"The number of principals providing *General Medical Services* increased by 137 to 20,325 in the 12 months to 1st October 1962. Of these, 73.3 per cent were in partnership, compared with 72.1 per cent in 1961.

Permanent assistants decreased from 1,169 to 1,020. The average number of patients on doctors' lists rose slightly from 2,292 to 2,304.

The number of patients in designated areas—those judged to be short of doctors—showed a slight rise of 0.5 per cent compared with the record low figure for 1961.

In postgraduate refresher courses for doctors in the academic year ended 31st August 1962, 3,425 places were filled, 458 more than in the previous year."

The Health and Welfare Services. *Report of the Ministry of Health*, 31 December 1962.