The deployment of home nurses

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Down, Janet and Snaith, A. H. (1975). *British Journal of Preventive and Social Medicine*, **29**, 53-57. **The deployment of home nurses.** A study in Derbyshire showed that there are wide variations in the populations served by individual home nurses. These variations are difficult to reduce. To assess the quantity and quality of home nursing that is provided more sophisticated formulae than the nurse/population ratio are necessary. For these data derived from output of work are inadequate; studies of need are required in each locality.

In 1972 the Department of Health and Social Security (DHSS, 1973) sent a letter of advice (Circular 13/72) to all local health authorities about the deployment of nursing teams in the community. Reference was made to the trend towards maximum treatment, care, and after-care of patients outside hospital, the increasing elderly population, the growth of early discharge schemes, and the need for effective nursing deployment in association with general practice. It was suggested that one home nurse for 4000 population was desirable but where there were extensive attachment schemes or a high proportion of elderly or disabled people in the population an adequate staff might be a ratio of one home nurse to 2500 population. An earlier DHSS letter (Circular 13/69) recommended the attachment of domiciliary nursing staff to general practitioners with the creation of community health teams and drew attention to the need for careful advance planning of all attachment schemes because of 'the staff and organizational implications'. This paper is concerned with the deployment of attached home nurses in Derbyshire and the problem of distributing them equitably.

The principle of attachment, which was first introduced in Oxford in 1956 (Warin, 1968), is that domiciliary nurses and health visitors work for a medical practice rather than in a geographical district. Some local health authorities have organized complete attachment schemes (Warin, 1968; McGregor, 1969) but many have not. The advantages of attachment have been described by a number of authors (Ambler *et al.*, 1968; Brewin, 1968; King Edward's Hospital Fund for London, 1968; Department of Health and Social Security, 1969;

Walker and McClure, 1969; Educare, 1970; Hockey and Buttimore, 1970; Department of Health and Social Security, 1971). In Derbyshire, until 1971, attachment arrangements were made piecemeal in response to requests made by individual general practitioners. Consequently many nurses were attached for all or part of their time while others were allocated patients exclusively by district. It was decided in 1971 to make a study of the populations served by nurses and to devise a plan for all of them to be attached to general practitioners. In principle each nurse should be responsible for a roughly equal number of people, no nurse should be attached to more than two practices, and each general practitioner should be offered a share of the total available nursing time proportionate to the size of his practice.

It was immediately apparent on examination of the distribution of the nurses which had arisen from the ad hoc attachment policy that the numbers of people served by the nurses varied greatly, from 1500 to about 10 000. The standard deviation of the distribution was 38% of the mean; only 13% of the nurses served a population that was between 90% and 110% of the county average.

THE PLAN

The information needed to produce the plan for attachments was:

(A) THE POPULATION OF THE WHOLE COUNTY (AND EACH PARISH)

This was obtained from the 1961 census and was corrected according to trends indicated in the Registrar General's 1971 population estimates. (The

advance analysis of the 1971 census figures has since been published and indicates a good degree of accuracy in the figures so obtained.) The total population of the county was estimated to be 594 900 excluding Chesterfield Borough, which had delegated responsibility for local health functions.

(B) THE NUMBER AND LOCATION OF HOME NURSES IN POST

The nursing establishment included home nurses, home nurse midwives, and relief home nurses. Each home nurse midwife was assumed to be the equivalent of 0.5 of a nurse, and because of the extremely variable extent of domiciliary midwifery it was proposed that attachments should usually apply only to the home nursing aspects of their duties. There were 17 relief home nurses (13% of the total) who formed a separate corps not responsible for a specific geographical area or medical practice. Their role was to stand in for nurses on leave. It was decided, for simplicity and flexibility, to continue to operate a corps of relief nurses rather than to attach all nurses and provide for relief by complex programming of nurses' work schedules. At the start of this study there were 131 individual home nurses, the equivalent of 128.5 full-time nurses in post, an average of one nurse for every 4630 people. The national average in 1972 was one nurse for a population of 5047 (Department of Health and Social Security, 1973). Excluding the relief nurses there were 114 individual home nurses in the county, the equivalent of 111.5 full-time nurses. This was the number which could be utilized in the attachment scheme. It yielded an average of one nurse for every 5335 residents in the county.

(C) THE NUMBER OF GENERAL MEDICAL PRACTITIONERS PRACTISING WITHIN THE COUNTY AND THE NUMBER, STRUCTURE, AND LOCATION OF GROUP PRACTICES

This was obtained from the lists published by the executive council. Only the 267 doctors whose practices were mostly within the county were included, since it was not proposed to attach Derbyshire nurses to doctors who had only a small number of patients in the county. There were three practices of five doctors, 11 practices of four, 36 practices of three, and 29 practices of two doctors. Forty-two doctors worked alone.

(D) THE NUMBER OF PATIENTS SERVED BY EACH GENERAL PRACTITIONER

Practice lists are held by individual medical practitioners and by executive councils but these

are available only with the consent of the individual doctors. While most general practitioners would undoubtedly have agreed to release this information, it was known that some others would not. What is required is a population file for each area devised specifically for the purposes of the health services. The absence of such a file is a serious impediment to the rational planning of community services for patients. In practice, however, when nurses are attached they do not work exclusively among patients from the attached practice. Inevitably they have to sort and exchange in each small locality. They may do this because work loads vary dramatically from day to day. It may be done to obtain efficiencies in their schedules; attachments do not and should not militate against the advantages of larger scale working. In effect nurses work their practices and their districts at the same time. In this study a standard method of estimating populations from published sources was therefore adopted.

The county was divided along parish boundaries into 21 geographical areas, each area being discrete in that no practitioner who had surgeries within it held any surgeries outside it. It was assumed that the flows of patients crossing area boundaries would cancel each other out. A notional number of patients for each general practitioner was calculated by dividing the population of each area by the number of doctors within it. Despite the probable inaccuracy of the estimated practice sizes, they were used in the preliminary plan, with the intention of making adjustments later, after the emergence of information about discrepancies between estimated and actual practice sizes and about the age distribution of practitioners' lists. It was expected that the implementation of an attachment scheme would itself make this information more available to the nursing management.

The 114 nurses were therefore assigned to the 21 defined areas according to the locality in which they had previously done most of their work. The average number of people who would be served by each nurse was calculated for each area. Where the number varied by more than 10% from the county average (5335) redeployment between areas was attempted. Even in theory, however, it was impossible to achieve the whole required redeployment. Too many nurses would have had to give up their homes which was, of course, not practicable. Thus it was not possible to devise a plan for redeployment, much less implement it, without recruitment.

IMPLEMENTATION

In the first instance recruitment was restricted by financial considerations to the appointment of 4.5 nurses, bringing the total in the attachment scheme up to 116 (119 individuals) and the average population per nurse down to 5128 (and including relief nurses, down to 4473). When this was done the average population per nurse for the attachment scheme in the 21 local areas—the area averages—ranged from 3630 to 7080 people, i.e., the number of nurses was such that in the best provided area each should serve a population of 3630, and in the worst provided area a population of 7080, figures which differed very markedly from the county average (5128).

The next step was to assign the nurses within each area to individual practices and to determine individual nurse populations. The intention was to keep the population served by each nurse as close as possible to the area average. As far as possible nurses were assigned to doctors for whom they had previously been doing most work. The distribution obtained is given in the Table (scheme 1). If the plan could be implemented unaltered, twice as many nurses (26%) would serve populations within 10% of the county average but the range would still be wide.

Area nursing officers were asked to discuss the plan with nurses and general practitioners. In many instances the plan was accepted with no alterations. In others, problems arose which demanded alterations to the plan. There were personality difficulties, geographical and travelling difficulties, and some cases of disagreement with the logic of the plan. These were mostly doctors who had been receiving much more than the average amount of nursing assistance and who stood to lose by the new arrangement. Only one person objected to the concept of attachment. In a few cases it was

possible to meet the objections without deviating significantly from the plan. More often than not compromise was necessary. The implementation of the plan with these variations resulted in only 22% of nurses serving populations within 10% of the county average and the range widened (Table, scheme 2).

Because the distribution of nurses remained so inequitable the effect of appointing further staff was examined. Substantial improvement in the distribution would be achieved if a further 5.5 nurses were appointed in the areas of greatest need. There would then be 121.5 nurses (125 individuals) in the attachment scheme and the average number of people served by each nurse would be 4896 (the county average would be 4295). Thirty-three per cent of home nurses would serve populations within 10% of the county average; the range would be considerably reduced (scheme 3). This development has now been completed.

In order to achieve the DHSS recommendation of one nurse to 4000 people a further 10 nurses would be required, increasing the total to 148.5 including relief nurses. For every nurse in the attachment scheme there would then be 4524 residents. From the Table (scheme 4) it will be seen that by appointing these nurses in the areas of greatest need the range of population served would be further reduced. However, the proportion of nurses serving populations within 10% of the county average would increase only slightly—to 33.8%—and the range of populations served by nurses would still be considerable. This development was not implemented.

DISCUSSION

The first objective of the plan, to attach home nurses to all general practitioners in the county,

TABLE
NUMBER OF (FULL-TIME EQUIVALENT) NURSES SERVING POPULATIONS OF DIFFERENT SIZE IN EACH OF FOUR ATTACHMENT SCHEMES

Scheme	Population							Total Nurses (full-time equivalent)	Patients/Nurse	
	≤2500	2500 —3499	3500 —4499	4500 —5499	5500 —6499	6500 —7499	7500 +		Mean	CV %
1.. ..	2	12	26	34.5	18	14	9.5	116.0	5128	28.0
2.. ..	4.5	16	23	31.0	16	14	11.5	116.0	5128	35.5
3.. ..	2	12	28	48.0	24	5	2.5	121.5	4896	21.0
4.. ..	2	13	47	57.5	12	0	0	131.5	4524	18.6

Scheme 1 Planned attachment with 119 nurses in post
 Scheme 2 Implemented attachment with 119 nurses in post
 Scheme 3 Implemented attachment with 125 nurses in post
 Scheme 4 Planned attachment with 140 nurses in post

was achieved without undue difficulty. However, the redeployment of the home nurses to make attachment possible resulted in only a small improvement in the distribution of the nurses. Distribution was improved more by recruitment in areas with a low nurse/population ratio. Even if the county ratio were to be reduced to 1/4000 residents there would still be considerable variation between the populations served by nurses.

When variables less susceptible to measurement than population, such as patient numbers, their age structure, the character of the nursing problems that have to be dealt with in a practice, the amount of ancillary nursing support, and the amount of medical and hospital support, are considered, the difficulty of drawing conclusions about the quantity and quality of domiciliary nursing care that is in fact given to a population becomes obvious. More sophisticated formulae than a simple nurse/population ratio are required, and to obtain them detailed studies of the work of the domiciliary nurse in the context of the community health care team are required. What is really needed is a model for the allocation of home nurses. It could perhaps take the following form:

Given an area where:

the number of people in the first category of need = n_1 , each of whom requires an amount a_1 of home nursing, and the number of people in the second category = n_2 , each requiring a_2 and the number of people in a third category = n_3 , each requiring a_3 , and so on, the ideal amount of home nursing in that area (H),

$$= a_1 n_1 + a_2 n_2 + a_3 n_3 \dots$$

Given a certain number (x) of nurses available to the county as a whole, the number which should be

$$\text{allocated to any one area} = \frac{Hx}{\Sigma H}$$

where ΣH is the sum for the whole county of the area values of H.

To develop and use such a formula requires the definition of categories of need, the ascertainment of the number of people in each category, and the assessment of the average amount of home nursing required by a person in each category.

In the application of such a model, values arrived at by observation of current practice may not be the best obtainable. The provision of medical and nursing care in the community may, like surveillance and screening programmes, require carefully planned and integrated model systems to be designed. Reliable data may not be available to make this possible. A new system may have to be designed and implemented to obtain data about

services that are given, about the extent to which underprovision is concealing need, and so on. The new system is likely then to need substantial revision in the light of the information generated by it. Furthermore, it may be inappropriate to regard such systems as research projects to be undertaken in representative areas only and adopted without further study in others. Information obtained from a scheme and the derivation from it of formulae governing home nurse provision may be a precondition for the rational use of these resources in each locality. Certainly the monitoring of provision with data restricted to the output of work, e.g., numbers of nurses, sessions worked, number of first treatments according to age group or place of treatment, and so on, as was the practice before the reorganization of the National Health Service, is inadequate to measure the quality of care of patients in their own homes or changes in it. Also, recruitment of nursing staff should always be in the context of such schemes because redeployment depends heavily upon opportunities which recruitment creates.

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