

## AGED INPATIENTS: THEIR INFLUENCE ON HOSPITAL PLANNING

D. G. FAIRBAIN, *Senior Research Officer, National Building Research Institute, Council for Scientific and Industrial Research, Pretoria*

The National Building Research Institute has for some years been investigating the planning of hospital buildings. A research project has also been in progress on the housing of aged people. The investigation incorporated in this article is the result of a study to determine the influence of the aged hospital patient on planning and his significance in this regard. For the purposes of this article, the aged are defined as those who are 60 years old or more.\*

The ageing of populations over the last 50 years in many Western countries is a well-documented fact, but there is often a certain amount of confusion in the interpretation of absolute and relative statistics when dealing with age distributions and population structures.

It has been argued that, with the advancement of medical science, there has been an increase in the expectation of life and therefore there are more people who become old. However, by the same token there are also more people who are young. Thus an increase in the expectation of life is not a major cause of relatively more aged people who create an abnormal bulge in the age distribution of a population. Such abnormality is due mainly to past trends in the birth rate and, to a somewhat lesser extent, in the death rate.

It is considered that available figures for the non-white population in the Republic of South Africa do not give an accurate picture of the age structure, but these figures indicate no significantly abnormal trends in age distribution.<sup>1</sup> However, comparatively accurate figures for the white population indicate definite trends. The birth rate rose sharply after the South African War, but later fell steadily until the middle 1930s. The overall death rate declined over this period as a result of the greater decline of the death rate in the younger age-groups. The full effect of these past trends is being felt in the early 1960s, since substantially more people are entering old age while the growth of the other age-groups is proportionately less. This imbalance may be expected to accelerate rapidly until the early 1970s, after which the increase of the aged population will begin to slow down. In the rural areas of South Africa this tendency is intensified by the absolute shrinkage in numbers of some of the younger age-groups.

These trends will be reflected in the increase in the relatively

\*Some countries have used 65 years of age as the definition of the lower limit of 'old age'; the use here of 60 is based on the age at which a person is entitled to receive an old-age pension in South Africa.

larger numbers of aged people seeking hospital accommodation and, with a greater average length of stay, the problem of wards containing an increasing number of longer-staying patients will aggravate any shortage of hospital beds caused at present by other factors.

In comparatively recent years pioneer work overseas has been carried out with a new approach to hospital treatment for the aged patient. Among others, Cosin<sup>2</sup> has shown the value of a dynamic approach in treating geriatric patients, with the emphasis on rehabilitation and not merely on care. This has involved the grouping of aged patients in departments or even hospitals, much use being made of physical and occupational therapy techniques.

### *Relative Bed Requirements*

Statistics related to three non-white and three white hospitals in the Transvaal were abstracted from records for the six-month period January - June 1959. Comparative figures (see hospitals A, B and C in both Tables I and II) for both the total inpatient load and the aged patients were taken in respect of: (a) average daily bed occupancy, (b) average daily admissions, and (c) average length of stay.

In the case of the Transvaal non-white aged patients, figures relating to bed occupancy were not directly available and the figures in these columns were derived from the formula:

$$\frac{\text{average daily bed occupancy}}{\text{average daily admissions}} = \text{average length of stay.}$$

The average length of stay for the non-white aged patients was obtained directly from the total aged patient admissions during the six-month period, involving 964 patients in hospital A, 418 in hospital B and 296 in hospital C.

On the other hand, the bed occupancy figures for the total inpatient load were directly available and the above formula was used to calculate their average length of stay. All figures for average daily admissions were directly available.

For the Transvaal white hospitals, all figures were derived as outlined above, except for the average length of stay of the 60+ age-group given for hospital A. In this case the averages were calculated on the basis of the figures for a random selection of 60 males out of a possible total of 1,040 aged male patients and 60 females out of 818 aged female

TABLE I. NON-WHITE HOSPITALS: BED OCCUPANCY, ADMISSIONS AND LENGTH OF STAY

Hospital	No. of beds occupied (daily average)			No. of admissions (daily average)			Average length of stay (in days)			60+ beds %
	All ages	60+		All ages	60+		All ages	60+		
		M	F		M	F		M	F	
A	1,698	48	32	147	3	2	12	16	16	5
B	891	44		63	2		14	22	21	5
C	463	32		32	1.6		14	22	16	7
D	268	23		12	1		21	24	21	9
E	127	11		8	0.5		22	20.5	24	9
F	861	36	20	50	1.7	1.2	17	21	17	7
G	211	18		16	1		13	22	16	9
H	312	14		18	0.7		17	20.5	18	5
J	95	7		7	0.3		14	14	30	7
K	74	4		5	0.2		16	22	16	5

TABLE II. WHITE HOSPITALS: BED OCCUPANCY, ADMISSIONS AND LENGTH OF STAY

Hospital	No. of beds occupied (daily average)			No. of admissions (daily average)			Average length of stay (in days)			60+ beds %
	All ages	60+		All ages	60+		All ages	60+		
		M	F		M	F		M	F	
A	693	74	99	68	5.7	4.5	10	13	22	25
B	220	14	20	26	1	1	8.5	14	20	15
C	177	35		16	1.6		11	22	23	20
D	347	38	56	32	2.5	2.4	11	15	23.5	27
E	295	26	31	25	1.5	1.7	12	17.5	18	19
F	227	27	32	16	1.6	1.3	14.5	17	24.5	26
G	85	20		8	1.2		11	16	18	24
H	40	13		4	18		12	17	16	33

TABLE III. TRANSVAAL NON-WHITE HOSPITALS: SICKNESS CATEGORIES OF AGED PATIENTS

Carcinoma	Cerebral/spinal	Eyes	Fractures	Heart	Lungs	Miscellaneous	Total
25	16	10	19	34	12	74	190

patients. For hospital B the comparative figures involved all 391 aged patients and for hospital C, all 295 aged patients.

Questionnaires were sent to the Orange Free State, Cape and Natal Provincial Administrations, who were asked to distribute these to each of three white and three non-white hospitals, as widely dispersed as possible and having, if possible, a bed establishment of more than 200. The period for which data were obtained in this instance was from October 1959 to March 1960. Usable figures were obtained from 7 non-white hospitals (hospitals D-K, Table I) and 5 white hospitals (hospitals D-H, Table II), each province being represented to a varying degree.

The number of beds occupied by non-white aged patients varied from 5 to 9% of the totals. This percentage will vary only as the two other factors in the formula vary, namely, the admission rate and the length of stay. It is unlikely that the length of stay will vary greatly in future, but with the advance of medical science it may shorten rather than lengthen — thus ultimately tending to reduce the percentage of beds required by aged patients. With regard to the admission rate, it can reasonably be assumed, from the available age distribution figures which do not show any significant abnormality, that the 60+ age-group will neither greatly increase nor decrease in the relative sense. However, in rural areas a problem may develop with the return of ageing people from urban centres, and this trend should not be overlooked.

Although the existing demand for beds for the non-white 60+ age-group appears to be relatively low, the absolute numbers involved are probably large enough to allow the function of separated nursing units in the larger hospitals, if desired.

The number of beds occupied by aged white patients varied from 15-33% of the totals.

Bearing in mind the trends of age distribution of the white population in the near future, it appears from the figures in Table II that the demand for beds for the 60+ age-group is relatively high. It is interesting to note that in hospital D, for example, the 60+ age-group constituted 16% of the average daily admissions, but formed 27% of the average daily occupancy of beds. This trend is true of the other hospitals to a greater or lesser degree.

Because of the rapidly increasing relative numbers of aged white people in the coming decade, it is to be expected that the proportion of this age group in hospitals will increase in a like manner. However, it is not certain that separate geriatric departments or wards are warranted on a basis of the above figures. In other words, mere weight of numbers may not in itself be sufficient reason for taking this step.

#### Sickness Categories

When a medical specialty has become a recognized medical discipline within a hospital, this does not necessarily indicate that some grouping of accommodation be planned for its practice. In South Africa it cannot yet be said that geriatrics is a recognized specialty, but it was found that the proportion of aged white patients in our hospitals was large and that they occupied hospital beds appreciably longer than patients of other ages; this aspect has been dealt with above, with regard to both white and non-white patients. Another possibility is that a predominance of one type of sickness may indicate medical grounds for grouping such patients, apart from or together with reasons of age. It was therefore considered necessary to know the broad sickness categories of aged patients found in hospitals.

TABLE IV. TRANSVAAL WHITE HOSPITALS: SICKNESS CATEGORIES OF AGED PATIENTS

Carcinoma	Cerebral/spinal	Fractures	Heart	Lungs	Miscellaneous	Total
39	16	45	28	35	116	279

TABLE V. PHYSICAL THERAPY: NON-WHITE PATIENTS AND ATTENDANCES OVER 6 MONTHS

	Hospitals											
	B			L			M					
	All ages	60+		All ages	60+		All ages	60+		M+F	M	F
		M+F	M		F	M+F		M	F			
Attendances (A) ..	17,460	1,660	1,343	317	1,027	23	23	—	2,133	138	133	5
Patients (P) ..	907	75	58	17	81	3	3	—	227	7	6	1
Ratio: A/P ..	19.3	22.1	23.2	18.6	12.7	7.7	7.7	—	9.4	19.7	22.2	5

TABLE VI. OCCUPATIONAL THERAPY: NON-WHITE PATIENTS AND ATTENDANCES OVER 6 MONTHS

	Hospitals								
	A				B				
	All ages	60+		All ages	60+		All ages	60+	
		M+F	M		F	M+F		M	F
Attendances (A) ..	26,252	166	100	66	2,249	110	100	10	
Patients (P) ..	2,015	12	7	5	85	6	5	1	
Ratio: A/P ..	13	13.8	14.3	13.2	26.5	18.3	20	10	

Information on the types of sickness of 190 aged patients in five Transvaal non-white hospitals was recorded, the data for each hospital being obtained for a sample day (Table III).

It is interesting to note that nearly one-third of these patients were suffering from either a carcinomatous or cardiac condition. However, when the small proportion of aged patients found in non-white hospitals is considered, the absolute numbers do not suggest that there are medical grounds for grouping these patients. Of the total of 190, 78 were placed in medical wards and 112 in surgical wards.

Similarly, information on the types of sickness of 279 aged patients in three Transvaal white hospitals was also recorded (Table IV).

In this case over half the patients were suffering from either fractures or cancer or heart/lung conditions. Of the total of 279, 131 were placed in medical wards and 148 in surgical wards. As was expected, the relative numbers of aged patients in these three hospitals far exceeded those found in the five non-white hospitals. However, here again the absolute numbers do not suggest that a grouping of aged patients can be supported on medical grounds, except possibly in the larger hospitals. For example, in this survey a hospital with an average daily bed occupancy rate of 693 over six months, was found on a sample day to contain 31 aged patients suffering from a carcinomatous condition, 30 from fractures and 18 from a lung condition. Nevertheless, it cannot be concluded that grouping these patients would be more convenient for nursing or medical functions.

#### Rehabilitation Treatments

In considering aged hospital patients as a group, any difference in nursing and treatment requirements for the group may have a profound effect on the form of ward accommodation provided for them. An important aspect of nursing and treatment in this regard is the rehabilitation of the sick person. Adams<sup>3</sup> has referred to the 'painfully slow process of rehabilitation in old age' and reasons that the scope for this work in general hospital wards is limited by priority being given to acutely ill patients and emergencies. However, from the planner's point of view there are two fundamental questions:

(a) Is there any justification, on grounds of nursing and

treatment requirements, for providing separate ward accommodation for aged patients in a general hospital?

(b) Assuming that there are reasons for doing so, does the nature of the ward accommodation required vary significantly from that for general wards?

An investigation was therefore undertaken with the object of determining the extent to which aged hospital patients are given physical medicine treatments in comparison with the average for all patients. A significant difference might indicate the need for a form of ward accommodation differing in certain respects from that for general acute patients, assuming there are reasons for grouping them together.

Data were collected at four Transvaal non-white hospitals, covering the six-month period July-December 1960, and included numbers of patients and attendances in respect of patients of all ages and of aged patients, the latter being subdivided into males and females (Tables V and VI).

In respect of physical therapy treatments (Table V) the average number of attendances per patient (ratio A/P) was greater for the old-age group than for all ages, in hospitals B and M. The contrary figures for hospital L are probably due to the existence of a large Bantu Refuge Home in the vicinity.

For hospital B, a correlation can be made with length of stay figures for the same hospital in Table I, although, of course, the figures apply to different periods of record. The average length of stay for the old-age group was 50% longer than for all age groups, but their average number of attendances for physical therapy per patient was only 14.5% greater than for all age groups.

Examining the figures for occupational therapy treatments (Table VI) and correlating with length-of-stay figures, the average length of stay for the old-age group in hospital A was 33% longer than for all ages, but their average number of attendances for occupational therapy was only 6% greater; for hospital B, a 50% greater length of stay is matched with a 31% lower average number of attendances for occupational therapy.

Data were also collected from three Transvaal white general hospitals, one orthopaedic hospital and one chronic sick hospital, covering the six-month period July-December 1960 (Tables VII, VIII and IX).

TABLE VII. PHYSICAL THERAPY: WHITE PATIENTS AND ATTENDANCES OVER 6 MONTHS

	Hospitals											
	A			B			C					
	All ages	60+		All ages	60+		All ages	60+				
	M+F	M	F	M+F	M	F	M+F	M	F			
Attendances (A) ..	9,620	1,212	765	447	702	202	48	154	961	391	136	255
Patients (P) ..	915	93	52	41	88	26	5	21	100	30	11	19
Ratio: A/P ..	10.5	13	14.7	10.9	8	7.8	9.6	7.3	9.6	13	12.4	13.4

TABLE VIII. PHYSICAL THERAPY: WHITE PATIENTS AND ATTENDANCES OVER 6 MONTHS

	Orthopaedic hospital						Chronic sick hospital		
	All ages	60+			All ages	60+			
		M+F	M	F	M+F	M	F		
Attendances (A) ..	4,861	591	208	383	4,379	2,665	1,221	1,444	
Patients (P) ..	344	30	10	20	246	89	40	49	
Ratio: A/P ..	14.1	19.7	20.8	19.2	17.8	29.9	30.5	29.5	

TABLE X. PHYSICAL THERAPY: TREATMENTS FOR AGED WHITE PATIENTS IN WARDS AND DEPARTMENT OVER 6 MONTHS

		Ward treatments					Ward total	Department treatments
		Bed	Chair	Walk	Combined			
A .. ..	M+F	885	45	18	21	969	243	
	M	645	26	5	1	677	88	
	F	240	19	13	20	292	155	
B .. ..	M+F	59	—	—	2	61	141	
	M	8	—	—	—	8	40	
	F	51	—	—	2	53	101	
C .. ..	M+F	217	—	—	—	217	174	
	M	59	—	—	—	59	77	
	F	158	—	—	—	158	97	
Orthopaedic ..	M+F	459	—	81	40	580	11	
	M	185	—	19	—	204	4	
	F	274	—	62	40	376	7	
Chronic sick ..	M+F	1,303	16	401	365	2,085	580	
	M	673	16	134	108	931	290	
	F	630	—	267	257	1,154	290	

In hospital A (Table VII), the aged patients comprised 10.2% of the total patients given physical therapy, and accounted for 12.6% of the attendances. Correlating with length-of-stay figures in Table II, a greater average length of stay of 80% is matched with a 24% higher average number of attendances for physical therapy. In hospital B, aged patients comprised 30% and their attendances 29%; a greater average length of stay of 100% is seen against a 3% lower average number of attendances. In hospital C, aged patients comprised 30% and their attendances 40.7%; however, a 100% greater average length of stay is seen against a 35% higher average number of attendances.

As might be expected, the numbers of attendances per patient for the orthopaedic and chronic sick hospitals (Table VIII) were much greater than for the general hospitals (Table VII). It is shown that for the orthopaedic hospital the old-age group comprised 8.7% of the total number receiving physical therapy treatments and accounted for 12.2% of the attendances. The comparable percentages for the chronic sick hospital were 36% and 61% respectively. At the orthopaedic hospital, aged patients received 40% more treatments per patient than for all ages; the figure for the chronic sick hospital was 68%. Unfortunately, no data had been recorded in respect of the length of stay at these two hospitals.

TABLE IX. OCCUPATIONAL THERAPY: WHITE PATIENTS AND ATTENDANCES OVER 6 MONTHS, IN ONE GENERAL HOSPITAL

	All ages	60+		
		M+F	M	F
Attendances (A) ..	2,924	225	51	174
Patients P ..	269	18	4	14
Ratio: A/P ..	10.9	12.5	12.8	12.4

The comparative figures for occupational therapy treatments for the aged group and all ages in the hospital in Table IX conform to the general pattern observed in figures for physical therapy treatments shown in Table VII. In this case no length-of-stay figures had been recorded.

Further data were recorded, in white hospitals, concerning the numbers of physical therapy treatments given to aged patients in the department and in the ward, the latter being subdivided into treatments given in bed, in a chair, walking treatments and treatments where two or more of these were combined. Three general hospitals, one orthopaedic hospital and one chronic sick hospital were covered during the period July-December 1960 (Table X).

It is seen that, with the exception of hospital B, more treatments were undertaken in the wards than in the depart-

ment; in all hospitals the majority of such ward treatments were given in bed.

From the data and correlations given above, whether for non-white or white hospitals, it is seen that although aged people in hospitals receive more physical medicine treatments than the average number for all age groups, this appears to have no significance when viewed against the relative length-of-stay figures. It is concluded therefore that there appears to be no justification for providing separate ward accommodation for aged patients in a general hospital on grounds of rehabilitative nursing treatments.

Assuming, nevertheless, that there are reasons for grouping aged people, the fact (recorded in white hospitals) that treatments given in wards generally outnumbered those given in the departments, suggests that provision be made in the ward plan to accommodate this function.

### Conclusion

Jennings<sup>4</sup> work on ward planning has indicated that, excepting for paediatric and obstetric patients, other ward accommodation requirements are similar in all fundamental respects. There are several unchanging functions within a ward: the patient receives medical treatment and nursing care, food is brought to him and wastes removed. Paediatric wards differ mainly because of smaller bed-sizes and obstetric wards differ because the sequence of functions in childbirth requires accommodation additional to that provided in general wards. The attempt here to discover whether significant differences exist in the provision of ward accommodation for aged patients has led to the conclusion that in only one aspect can

something of general planning significance be found: the aged patient takes longer to recover than his younger fellow-patient.

It is considered that whereas aged patients need not be provided with separate accommodation in a general hospital, their characteristic longer stay in hospital suggests that at a stage in their recovery they be placed in a form of ward accommodation removed and fundamentally different from that normally provided in general acute wards. Indeed, this form of ward accommodation will be suitable for the rehabilitation of all long-stay patients, irrespective of age. In such a ward, the majority of patients can be expected to be ambulant or semi-ambulant and consequently the nurse/patient ratio can be lower than in general acute wards. Moreover, rehabilitative treatment can be brought closer to the patient than is possible in a general ward; thus exercise spaces can be provided for those physical medicine treatments carried out in the wards. The core of the acute general hospital is thereby kept acute and the more leisurely functions of rehabilitation of the long-stay patient are removed to a location closely related to the physical medicine departments.

It is clear that further research is required on the detailed planning requirements for these proposed long-stay or 'rehabilitation' wards.

### REFERENCES

1. Badenhorst, L. T. (1950): *Popl. Stud.*, **4**, 3.
2. Cosin, L. (1952): *J. Geront.*, **7**, 570.
3. Adams, G. F. (1960): *Lancet*, **1**, 815.
4. Jennings, A.: (1962): *Hospital Design 4: Ward Planning*. Pretoria: CSIR.