

# THE EFFECT OF POLYCLINIC SERVICES IN A LOWER INCOME GROUP COMMUNITY

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The hospital is the centre of curative medicine, requiring comprehensive facilities for specialized staff and complicated equipment. The cost load of these facilities makes it advisable to centralize them in the larger hospitals and, to ensure that efficient use is made of the services available, there must be an increased screening of patients and a check on the efficiency of treatment given at the out-patient department.

The size of the area served by these centralized hospitals is such that the patient often has to travel a considerable distance to reach the hospital. There is necessarily a tendency for the out-patient departments to extend and split off, and form separate and distributed diagnostic centres offering consultant and minor therapeutic services to the community. When these functions are combined with the preventive medical services conducted in the ante- and post-natal and child welfare clinics, and in the houses of the community by health visitors and district nurses, we have the polyclinic.

The polyclinic is the centre of prophylactic medicine for the community. Its services relieve and filter the patient load on the parent hospital, by early diagnosis and cure of the sick, the care of the convalescent, education in hygiene and generally watching over the health of the community.

In order to investigate the need for a polyclinic in the community and the extent to which it would relieve the load on the parent hospital, an experimental polyclinic was designed in the new Bantu urban area of Meadowlands, Johannesburg.

To determine the extent of the accommodation required it was necessary to know how many patients from a given community size, and what percentage of these, could be expected in each clinic. Studies were therefore made at 6 urban polyclinics for Bantu in the Transvaal. In Table I the number of patient visits at each of these polyclinics

TABLE I. SIX URBAN BANTU POLYCLINICS

Population	Patient visits per year*	Average visits per person per year
10,479 .. .. .	38,008	3.7
14,490 .. .. .	46,551	3.2
40,000 .. .. .	115,332	2.9
70,000 .. .. .	265,776	3.8
5,300 .. .. .	31,757	6.0
23,891 .. .. .	98,252	4.1
Average .. .. .		3.9

\* Excluding patient visits to tuberculosis and venereal disease clinics, which were omitted as the figures were not available at all polyclinics.

per year is divided by the population, to arrive at an average number of visits per person per year. This proved to be 3.9 and provides a basis for estimating the number of patients that can be expected at a polyclinic; i.e. if  $A$  = the total

TABLE II. PATIENT ATTENDANCES AT CLINICS IN SIX POLYCLINICS

Curative clinics	Ante-natal clinic	Child welfare clinic	Tuberculosis clinic
82%	5%	13%	
42%	8%	50%	
63%	10%	15%	7%
72%	7%	9%	11%
80%	5%	15%	15%
73%	4%	25%	6%
Average 68%	6.5%	21%	9.5%

attendances per year,  $f$  the average number of visits per person per year and  $P$  the total population, then  $A = fP$ . Table II shows the average distribution of the patients amongst the main clinics in the same 6 polyclinics. This provided the basis for estimating the attendances at Meadowlands polyclinic, and hence the accommodation necessary.

At the opening of the polyclinic, the population of Meadowlands was approximately 30,700. During the first 13 weeks of operation this figure rose to 32,300. Therefore, to assess the accuracy of the method of predicting the size of the polyclinic, it is necessary to compare the predicted attendance figures with the actual attendance figures given in Table III for each of the 13 weeks. It will be seen that the actual attendance figures are considerably lower than the

TABLE III. PREDICTED AND ACTUAL WEEKLY ATTENDANCES AT MEADOWLANDS POLYCLINIC

Predicted attendances (approx.)	Actual attendances	68% of predicted attendances (approx.)	Actual attendances (curative only)†
2,300	719	1,560	643
2,300	1,426	1,560	1,321
2,300	1,642	1,560	1,584
* 2,350	1,546	1,580	1,485
* 2,350	1,436	1,580	1,436
* 2,350	1,564	1,580	1,515
* 2,400	2,071	1,600	2,018
* 2,400	1,957	1,600	1,873
* 2,400	1,806	1,600	1,717
* 2,400	1,915	1,600	1,835
* 2,450	1,992	1,660	1,917
2,450	1,781	1,660	1,678
2,450	1,645	1,660	1,534

\* First 8 weeks of full operation.  
† Exclusive of anti-natal cases.

predicted attendance figures. This is because the polyclinic is run by the Provincial medical services, which are mainly concerned with a curative service; that is to say, all those attending are treated as sick patients, which excludes purely preventive clinics. From Table II it will be seen that patients attending curative clinics constitute 68% of the total attendances. A comparison on this basis, of predicted attendances with actual attendances (Table III) shows that within the nature of the service the pattern of patient attendances at Meadowlands polyclinic conforms to the patterns observed in urban polyclinics in the Transvaal.

To determine further the effect on the medical services, patient attendances at the casualty and out-patient departments of Baragwanath Hospital—the parent hospital to the Meadowlands polyclinic—were studied before and after the opening of the polyclinic. In Fig. 1 these are compared with the increase in population at Meadowlands. It will be seen that after the polyclinic opened, attendances of Meadowlands patients dropped from 3.56 to 2.46 patients per 1,000 population per week at Baragwanath Hospital.

In Table IV, patient attendances at the polyclinic are analysed in relation to those at Baragwanath hospital. It will be seen that the patient attendances at Baragwanath hospital are higher than the number of patients referred by the polyclinic. The reason for this is that some Meadowlands patients go direct to the casualty and out-patient department at Baragwanath Hospital without first attending the polyclinic, either because the polyclinic is closed or for personal reasons.

TABLE IV

Weekly attendances at Meadowlands Polyclinic	Number referred to Baragwanath Hospital	Weekly attendances of Meadowlands patients at Baragwanath Hospital		
		Casualty and OPD	Paediatric OPD	Total
719	1	83	25	108
1,426	4	68	10	78
1,642	1	53	9	62
*1,546	31	72	23	95
*1,436	32	72	17	89
*1,564	31	56	30	86
*2,071	32	55	19	74
*1,957	24	61	24	85
*1,806	25	63	26	89
*1,915	42	50	18	68
*1,992	38	55	19	74
1,781	26	61	12	73

\* First 8 weeks of polyclinic in full operation.

An analysis of the attendances at Baragwanath Hospital (as in Table V) shows that if an embargo were placed on patients' going direct to the parent hospital (except on Sundays when the polyclinic is closed) the patient attendances at the casualty and out-patients departments would be further reduced to approximately 0.7 patients per 1,000 population per week. The figures in the last column of Table V indicate that such a reduction is taking place.

It will be seen from Tables III and IV that in the first eight weeks of full operation 14,287 patients attended the polyclinic of which 255 (or 1.8%) were referred to the hospital. So if we term the number of patients referred to the parent hospital from the polyclinic *R* then the demand for specialist diagnostic and treatment facilities for any given Bantu urban community can be assessed from the

TABLE V.

Total attendances at Baragwanath casualty and OP patient departments	Patients referred from polyclinic	Patients going direct to Baragwanath	Patients at Baragwanath on Sunday	Patients going direct during the week
108	1	107	17	90
78	4	74	13	61
62	1	61	10	51
*95	31	64	6	58
*89	32	57	12	45
*86	31	55	17	38
*74	32	42	12	30
*85	24	42	15	27
*89	25	64	16	48
*68	42	26	6	20
*74	38	36	7	29

\* Polyclinic in full operation except for dental clinic.

ratio  $R \div A$  (where *A* is the total attendances at the polyclinic per year).

Table VI analyses the attendances at Baragwanath Hospital of patients referred from the polyclinic. It shows that the greatest demand is for X-ray diagnosis and the question will naturally arise whether it is not advisable to install

TABLE VI.

Total referred	X-ray diagnostic	Paediatric OPD	Ante-natal clinic & Gynaecology clinic	Dental clinic	Surgical register	Medical register	Ear, nose and throat	Eye clinic	Physiotherapy	Admissions
4	—	—	—	—	—	—	—	—	—	1
1	—	—	—	—	—	—	—	—	—	2
1	—	—	—	—	—	—	—	—	—	1
* 31	11	1	7	1	3	5	—	—	—	4
* 32	15	4	1	3	2	3	—	—	—	6
* 31	13	4	4	—	2	3	1	—	—	9
* 32	16	2	1	4	3	7	—	—	—	4
* 24	15	7	2	—	1	3	2	—	—	3
* 25	17	14	1	—	3	3	—	—	—	5
* 42	30	21	1	—	7	4	—	—	—	3
* 38	19	15	3	1	3	7	—	—	—	4
† 255	136	68	20	9	24	35	3	2	2	38
‡ 1.8	0.95	0.48	0.41	0.063	0.16	0.25	0.021	0.014	0.014	0.27
%	%	%	%	%	%	%	%	%	%	%

\* First 8 weeks of full operation except for dental clinic (preceding 3 weeks not included in totals).

† Totals. ‡ Percentage of total attendances at polyclinic.

equipment in the polyclinic to obviate the expense of sending patients to the parent hospital. The answer to this can only be determined by investigation, but as the average number referred for X-ray diagnosis is at present less than 3 patients per day, it would appear unnecessary to decentralize these facilities.

Another point that arises out of Table VI is that in correlating the number of patients admitted to hospital after being referred from the polyclinic, the population of the area and the average stay in a hospital, it is possible to predict the number of hospital beds necessary for a given area. For instance if we take *B* as the number of beds required, *a* as the number of patients admitted to the in-patient department for treatment after being referred from the polyclinic, *S* as the average patient stay in days, and *P* as the population in thousands, then

$$B = \frac{aS}{365}, \text{ and } B = \frac{aS}{365} \times \frac{1}{P}$$

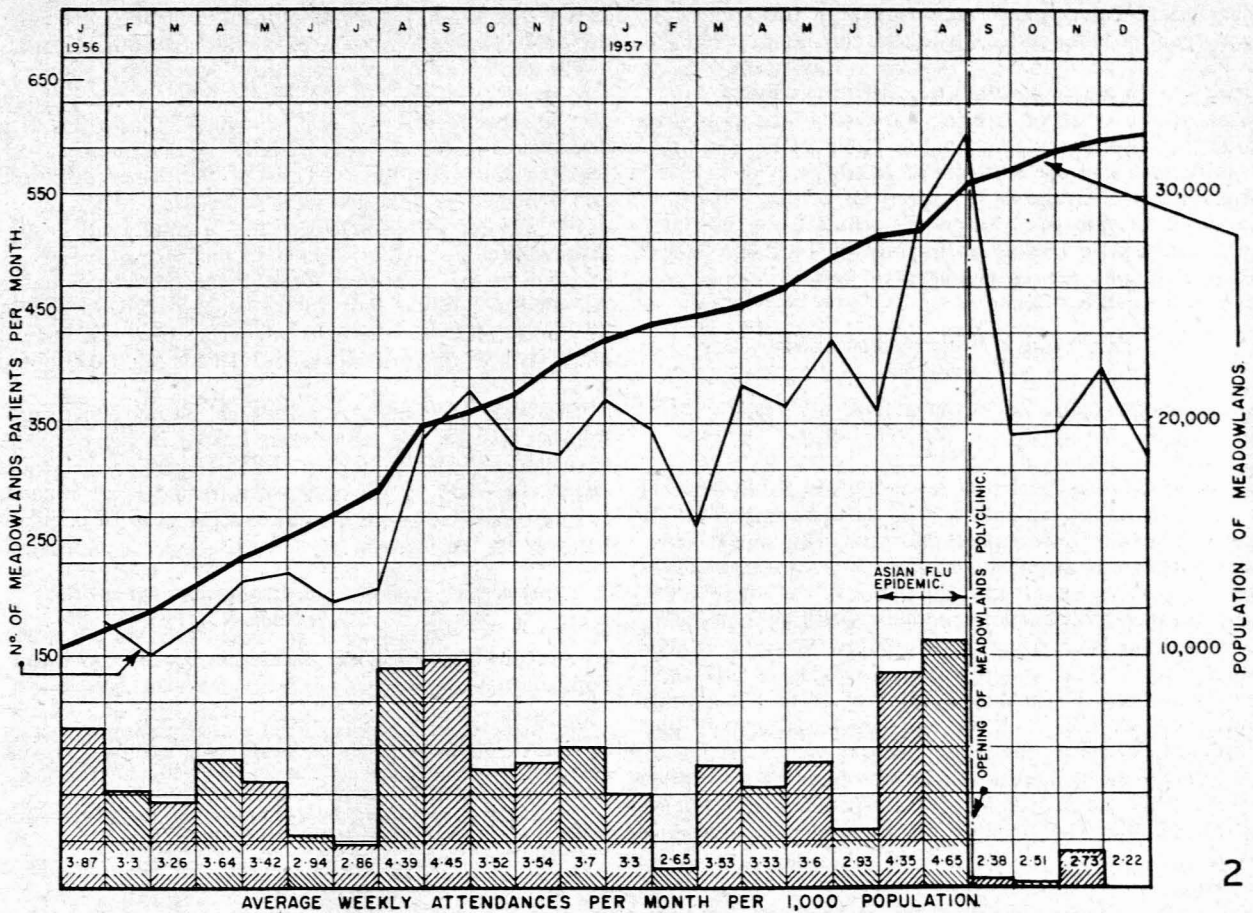


Fig. 1. Comparison of attendances of patients from Meadowlands at Baragwanath Hospital.

will express the community's requirements in beds per 1,000 population. On the figures available for the Meadowlands polyclinic, together with an average stay of 10 days in hospitals in that area, the demand appears to be 0.2 beds per 1,000 population.

Table VII shows the total admissions at the two general hospitals (Baragwanath and Coronation) serving the area in which Meadowlands is situated, compared with the admission figures for patients referred from the polyclinic for specialist attention to Baragwanath Hospital. When

TABLE VII.

Admissions from Meadowlands at:	October	November	December
Baragwanath Hospital ..	74	54	76
Coronation Hospital ..	13	7	6
Total* ..	<u>87</u>	<u>61</u>	<u>82</u>
Admissions at Baragwanath Hospital of patients referred from Meadowlands ..	23	25	24

\* These figures indicate that the actual demand is 0.7 beds per 1,000 population.

considering these figures it must be remembered that the polyclinic reduces the number of patients admitted to hospital by diagnostic filtering and treatment in the polyclinic and at home. The latter, in the form of follow-up care, can

further relieve the bed demand by making possible earlier discharge and consequently reducing the average stay.

An analysis, by medical opinion, of the cases admitted directly to Baragwanath Hospital (i.e. those who have not attended the polyclinic first) indicates that as the hospital

TABLE VIII. COSTS PER PATIENT UNIT IN SHILLINGS

Direct Costs	Baragwanath Hospital			Meadowlands Polyclinic
	In-patients	Casualty	Out-patients	
Provisions ..	..	..	..	.18
Surg. and pharm. supply ..	6.53	2.16	1.99	1.55
Domestic ..	.93	.07	.04	.25
Buildings and grounds ..	.32	.02	—	—
Salaries, wages and allowances ..	6.36	1.76	2.62	2.35
Sub-total ..	14.14	4.00	4.65	4.33
Indirect Costs				
Tea-room feeding ..	.6	.02	.02	—
Main kitchen ..	2.4	.46	.04	—
Compound ..	.11	—	—	.04
Doctors' quarters ..	.15	.06	.06	—
Nursing service ..	5.22	.61	.24	—
Theatre ..	.80	—	—	—
Physiotherapy ..	.17	—	.03	—
X-ray ..	.75	3.27	1.02	.13
Occup. therapy ..	.24	—	.04	—
Orthopaedic workshops ..	.20	—	.84	—
Boiler house ..	.27	.10	.09	—
Linen and sewing room ..	.29	.11	.10	—
Workshops ..	1.09	.42	.38	.29
Administration ..	5.26	2.01	1.85	1.44
Hist. laboratory ..	.24	.09	.09	—
Grand total ..	<u>31.43</u>	<u>11.15</u>	<u>9.72</u>	<u>6.23</u>
Attendances (patient days) ..	48,138	14,304	12,092	7,660



authorities become more accustomed to the polyclinic service, and the latter perfects itself, the community's demand for beds will be reduced. Further investigation will be carried out to determine the extent of this reduction.

Finally, the costs of treating patients at the polyclinic and in the hospital are compared in Table VIII. From this it will be seen that the unit cost of treating a patient at the polyclinic was 56% and 64% respectively of that of treating him in the casualty and out-patient departments, and 20% of that of treating him as an in-patient. Further the cost of the polyclinic services per head of population per year can be estimated by taking

$$\frac{\text{the unit cost} \times \text{number of attendances}}{\text{total population.}}$$

At Meadowlands this works out at 24s. per year.

#### SUMMARY

The effect of a polyclinic in a lower income group depends on the demand of patients for its services, expressed in terms of patient attendances per year, determined from  $A=fP$  (where  $A$  is the total attendance,  $f$  the average attendance per person, and  $P$  the population). In urban areas in the Transvaal this demand can be assessed by multiplying the population by a factor 4 to estimate the total patient attendances per year where full services (i.e. curative and preventive) are given, and by a factor of  $4 \times 68 \div 100$  where partial services (i.e. curative and ante-natal clinics and excluding tuberculosis cases) are given.

A comparison of patient attendances from Meadowlands at the Baragwanath casualty and out-patients departments before and after the opening of Meadowlands polyclinic

shows that there was a drop from 3.56 to 2.46 patients per 1,000 population per week at Baragwanath Hospital.

The need for the comprehensive specialized services of the general hospital by patients attending the polyclinic can be assessed as being approximately  $1\frac{1}{2}\%$  to 2% of the attendance figures at the polyclinic. In this number 0.95% required the diagnostic services of the X-ray department and 0.27% were admitted as in-patients.

The number of hospital beds that a community requires, assuming full occupancy, is given by the formula  $B=aS \div 365$  where  $B$  is the number of beds,  $a$  the number of patients admitted to hospital, and  $S$  the average patient stay in days at the hospital. In Meadowlands where there are full polyclinic services this proved to be 0.7 beds per 1,000 population.

The costs of treating a patient in the polyclinic were as follows: 64% of the costs when treated in the out-patient department; 56% of the costs when treated in the casualty department; 20% of the costs when treated as an in-patient. It is also possible to assess the costs per head of population per year by the formula

$$\frac{\text{unit cost per patient} \times \text{patient attendances at polyclinic}}{\text{population.}}$$

At Meadowlands this was found to be 24s. per head of population.

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