

# District Surgery in Malawi

A two year study of surgical rates and indices.

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The objectives of the study were to determine the rates of surgical output for the rural population, to compare rates between individual hospitals and to propose a realisable target figure for rural surgical output. In addition, various indices of surgical activity were examined to identify where surgical services were weakest.

## INTRODUCTION

Surgical output in developing countries has been reviewed by Nordberg and others<sup>1-5</sup> The conclusions have been that there is insufficient data from African countries on rural surgical practice. District surgical services are inadequate and inconsistent and large scale, population-based data on output in Africa do not exist.

The true surgical requirement of a rural African population is also not precisely known, but based on western practice, estimates of the proportions of people who get adequate surgical treatment compared to those who do not have varied from 1 out of 6 for inguinal hernia to less than 1 out of 10 for caesarean section<sup>2</sup>.

Data gathered over a 2 year period from 1993 to 1995 on surgical and anaesthetic activities in 18 District Hospitals in Malawi are presented.

**Proportions of people who get adequate surgical treatment compared to those who do not varies from 1 out of 6 for inguinal hernia to less than 1 out of 10 for caesarean section.**

## METHODS

18 District Hospitals (14 Government and 4 mission) were selected on the basis of widespread location to cover as much of the country as possible.

The classification of cases as "major" or "minor" was based on the existing system of logging cases: most operators classified as "major" such procedures as inguinal hernia

TABLE 1

ANNUAL SURGICAL OUTPUT FROM 18 DISTRICT HOSPITALS COMPARED TO CENTRAL HOSPITAL  
DATA OVER TWO YEARS FROM SEPTEMBER 1993 TO SEPTEMBER 1995

HOSP	BEDS No.	MAJ OPS	C/S No.	C/S: MAJ	% MAJ FEMALES	TOTAL OPS
A	257	401	203	0.53	69%	2406
B(=)	245	499	233	0.47	88%	1650
C	140	275	188	0.70	85%	911
D	205	337	190	0.56	80%	2228
E	263	324	203	0.63	88%	1913
F	101	140	74	0.53	74%	457
G	115	116	106	0.91	97%	823
H	168	301	233	0.78	85%	1104
I	80	482	390	0.81	92%	1282
J	221	541	367	0.69	90%	1487
K	177	240	171	0.70	88%	826
L(=)	160	280	222	0.79	93%	909
M	280	370	219	0.59	76%	1123
N(=)	254	340	162	0.48	87%	1098
O	200	230	143	0.61	82%	1214
P	220	298	193	0.66	76%	1318
Q(=)	250	305	169	0.55	73%	825
R	220	254	178	0.70	81%	942
<b>TOTAL</b>	<b>3,556</b>	<b>5,733</b>	<b>3,644</b>			<b>22,516</b>
<b>AVE. DIST HOSP</b>	<b>198</b>	<b>319</b>	<b>202</b>	<b>0.65</b>	<b>83.6%</b>	<b>1,251</b>
<b>QECH (1992)</b>	<b>950</b>	<b>2,973</b>	<b>1,100</b>	<b>0.37</b>	<b>66%</b>	<b>9,560</b>

(m) = mission hospital

**TABLE 2**  
**ANNUAL SURGICAL RATES (1993-1995)/100,000 POPULATION**

Hosp.	MAJ OPS./ips	LAP: MAJ OPS	MAJ.OPS/100,000 pop.	C/S per 100,000 pop.	TOTAL OPS/100,000 pop.
A	1.7	0.20	228	116	1,337
B(m)	1.86	0.28	242	114	801
C	1.80	0.12	157	107	521
D	2.2	0.16	67	37	432
E	0.95	0.19	71.5	45	429
F	1.49	0.24	103	54	334
G	1.0	0.04	31	28	215
H	1.27	0.07	105	80	381
I	3.75	0.11	237	188	619
J	1.54	0.19	75	50	204
K	1.03	0.14	44	31	151
L	2.15	0.13	95	74	303
M	1.18	0.16	70	41	212
N(m)	1.35	0.41	220	104	708
O	0.99	0.15	119	84	638
P	1.08	0.09	59	38	258
Q(m)	1.40	0.13	199	109	532
R	0.92	0.06	42	29	155
<b>AVE DIST HOSP</b>	<b>1.54</b>	<b>0.16</b>	<b>120</b>	<b>74</b>	<b>457</b>
<b>QECH (1992)</b>	<b>2.5</b>	<b>0.22</b>	<b>269*</b>	<b>151</b>	<b>865*</b>
USA .....					8,253
UK .....				.est.	5,000
COLOMBIA .....					1,769
PAKISTAN (RURAL) .....					124

\*figures adjusted for estimated catchment populations to allow for referrals from outside district.

(m) = mission hospital

repair, caesarean section, laparotomy, limb amputations, etc. "Minor" operations are typically uterine evacuation, operation for hydrocele, tubal ligation, cataract extraction (under local anaesthesia), suturing, abscess drainage, etc.

Hospitals were visited at 3-6 month intervals throughout the duration of the project. The following data were collected for 8 consecutive 3-month periods from September 1993 to August 1995:

- \* Total major and minor output, with rates per 100,000 population.
- \* The number of caesarean sections (c/s) performed and rate per 100,000 population. The ratio of c/s to all major operations was calculated [c/s:majors].
- \* The number of laparotomies performed. The ratio of laparotomy to the total number of major operations was calculated [lap:majors].

\* The percentage of major cases that were female was determined [maj female].

\* The status of the person doing the surgery was noted.

\* Likewise, the status of the person giving anaesthesia was noted.

**Many mothers in the district apparently do not get operative delivery when it is required.**

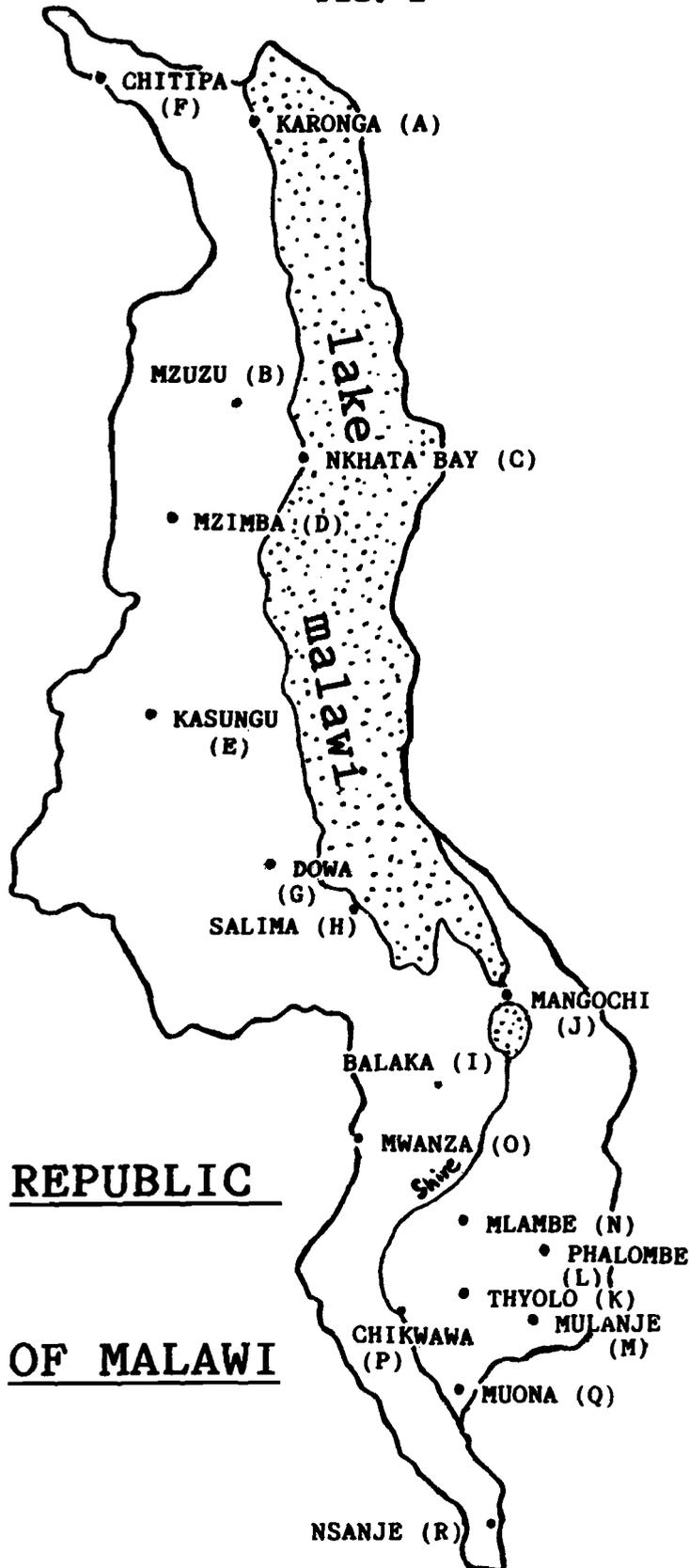
**RESULTS:**

Complete data were collected for 18 District Hospitals, located as shown on the map. (Fig. 1)

Based on examination of 45,032 major and minor operations carried out in the study area, which had a catchment population of 6,100,000, the average annual rate for all operations was 369 per 100,000 population (range 151-1337).

### 18 DISTRICT HOSPITALS IN STUDY

FIG. 1



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11,466 major operations were performed giving an average annual rate of 94 per 100,000 (range 31-242). The data is shown in tables 1 and 2.

A total of 7,288 caesarean sections (c/s) were carried out, 63.6% of all major operations. The rural c/s rate was 60 per 100,000 compared to the central hospital rate of 151 per 100,000.

In the district hospitals, 75% of all surgery, including most major operations, was carried out by paramedical cadres i.e. Clinical Officers or Medical Assistants, 8.2% by the resident District Health Officer and 0.8% by visiting specialists. All general and regional anaesthesia was given by paramedical cadres.

The ratio [% major females] showed an average 83.6% of all major surgery was carried out on women. Apart from caesarean section, virtually all these cases were laparotomy for ruptured uterus, ruptured ectopic or drainage of peritoneal pus.

No case of general anaesthesia or ketamine administration was recorded as being given by a theatre servant.

**The reduced rural caesarean section rate can be considered along side the current rate for maternal mortality in Malawi of 620 per 100,000.**

## DISCUSSION

In the case of caesarean section the average rural rate was half that at the central hospital. Even allowing for possible excessive intervention during labour in a central hospital, many mothers in the district apparently do not get operative delivery when it is required since when extrapolated for the whole Malawi rural population of about 10 million people, the district c/s rate of 60 per 100,000 represents 6,000 c/sections carried out. Using the central hospital c/s rate of 151 per 100,000, there is a shortfall of 9,000 operative deliveries. Considering that large, unknown numbers of women deliver at home without medical attention, the significance of this figure is an interesting matter for speculation. Does it truly represent that number of obstructed labours which receive no intervention during village confinement?

The reduced rural caesarean section rate can be considered alongside the current rate for maternal mortality in Malawi of 620<sup>6</sup> per 100,000. Even if there is a 9,000 deficit per annum in numbers of caesarean sections performed, many of which will result in the death of the mother, it apparently contributes only about 1/10th of the current maternal mortality. A recent study in Zimbabwe has examined this association in more detail.<sup>7</sup>

Based on the output of the specialist referral hospital (QECH), which some newer hospitals approach, the author proposes a target surgical rate of 250-300 major operations per 100,000 population which could be achieved. At present this figure has about 35% attainment.

It is clear that the rural dweller in Africa is still not well served by his or her District Hospital and in the most deprived areas of Malawi, surgical rates are about 2.5% of rates in South America 20 years ago and less than 1% of rates in Europe and North America.

## The Surgery of Women.

83.6% of all major surgery in the districts was obstetric or gynaecological. Apart from the large numbers of caesarean sections, laparotomies accounted for most major surgery and in the district this operation was almost exclusively performed on women for either pelvic infection, ruptured uterus or ectopic pregnancy. This sex bias has been noted elsewhere in Africa<sup>8</sup>

The few district male major operations are almost entirely hernia repairs and trauma surgery. At one peri-urban Mission hospital with an active surgical service (hospital "N"), the ratio [lap:majors] increased in an almost straight line from 22% to 52% in two years, without a change in other indices, virtually all these laparotomies being performed on women for the three indications above.

If this explosive increase in one hospital represents a genuine trend, it serves as an indicator of the future pattern of African surgery. An associated statistic, the Maternal Mortality Rate, has been noted in Zimbabwe to have increased by 200 -300% in just two years.<sup>8</sup>

The high prevalence of AIDS and the failure of population control measures are undoubtedly significant factors responsible for the current epidemic of female major surgery in Malawi.

Other laparotomies (eg. for bowel obstruction) are common at the Central Hospital (77% of all major general surgery at QECH in 91/92 were laparotomies) but rarely performed in the district. Such cases that do present at District Hospitals are usually referred away, but the numbers do not match the expected incidence of these conditions in the district: the presumption is that these predominantly male cases die outside the hospital for lack of an operation.

**It is clear that the rural dweller in Africa is still not well served by his or her district hospital.**

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