

# A PILOT SURVEY OF ADMISSIONS TO TWO SURGICAL WARDS

R. ATTARD

M.D., B.Sc. (MALTA), F.R.C.S. (ENG.)

*Surgeon, St. Luke's Hospital  
Demonstrator in Surgery,  
Royal University of Malta*

A three months prospective survey of admissions to two general surgical wards, one for men and one for women, was carried out between the 1st of May and the 31st July, 1964. These two wards contain half the number of beds allocated to general surgery at St. Luke's Hospital. Emergency cases are admitted on some days to these two and on an equal number of other days to the two other general surgical wards. The male ward has a complement of 45 beds while the female ward has 35 beds for adults and 10 cots for children. Boys under the age of 5 are admitted to this last section.

There were several reasons for carrying out the survey. It was thought it might be of interest to establish the relative incidence of the conditions for which patients were admitted during the above-mentioned period and to calculate the length of stay of the patients in hospital. The period May-July was chosen completely at random. There were always several diabetic patients in each ward: the number of such admissions and other information could give some indication of the size of the problem. It should be stated in this respect that a pilot survey on diabetes in Malta was due to commence around this time (Zammit-Maempel, J.V., 1965). Again, many patients were obviously overweight and the survey could give a better idea of their number as well as of the relative height of adult patients. Overcrowding was more often a problem in the male ward and the survey might provide some explanation for this.

## Method

All the patients admitted to the two

wards were measured for weight and height. They were questioned with regard to a personal and family history of diabetes mellitus. A random specimen of urine was taken from each patient and examined in the ward for reducing substances, using Benedict's solution. This is part of the ward routine. A second specimen of urine was taken from each patient two hours after lunch and again examined for reducing substances in the ward with the same method. Those patients who were found to have postprandial glycosuria were further investigated by a blood sugar estimation which was carried out two hours after breakfast. A level above 100 mg. of glucose per 100 c.c. of blood was taken as an indication that the patient was suffering from diabetes mellitus. On the day of discharge, the final diagnosis was noted as well as the length of stay in hospital. In order to carry out the survey at all, it was essential to disturb ward and laboratory routine work as little as possible. Hence, it was decided not to carry out more elaborate procedures.

A total of 382 patients were admitted during the three month period. 5 patients (new growth of the nasopharynx, haematemesis, acute cholecystitis and two cases of head injury) were not included in the survey. They were too ill on admission and died soon after. Another 5 patients, being infants under one year, were not included in the survey; nor were 12 others who stayed in hospital for less than 24 hours thus eluding proper investigation. This left a total of 360 patients included in the survey. 43 of these were found to be suffering from diabetes mellitus and will be further considered later in the article.

TABLE I

## Patients excluded from the Survey

Total number of admissions	382
Too ill for inclusion in the survey	5
Infants under one year Admitted for less than 24 hours	5
	12
	—
	22
Number of patients remaining in survey	360

## Discussion

Of the 360 patients, 228 (63.3%) were males and 132 (36.7%) females. The preponderance of males over females was found in all age groups except in the groups 20-24, 30-34 and 45-49. (Table II).

TABLE II  
Age and sex incidence  
of 360 patients in Survey

Age in years	Sex		Total
	M.	F.	
1-4	15	7	22
5-9	15	6	21
10-14	22	7	29
15-19	23	11	34
20-24	9	14	23
25-29	10	6	16
30-34	11	16	27
35-39	9	4	13
40-44	21	10	31
45-49	7	11	18
50-54	15	13	28
55-59	11	4	15
60-64	17	8	25
65-69	21	7	28
70-74	13	5	18
75-79	6	2	8
80-84	3	1	4
Total	228	132	360

It is interesting to note that there were more than twice as many females as males admitted in 1964 throughout the hospital. Table II shows that the largest number of patients, 34, was to be found in the age-group 15-19; while the next two largest were to be found in age-groups 40-44 and 10-14, with 31 and 29 patients respectively.

TABLE III

## Disease Frequency among 360 patients

Disease	M.	F.	Total	Average stay in hospital in days
Inguinal Hernia	32	1	33	15
Acute Appendicitis	16	17	33	14.3
Closed Head Injury	24	6	30	8.6
Abdominal pain	9	9	18	8.1
Renal colic, etc.	13	3	16	14.1
Cholecystitis, etc.	4	10	14	24.3
Umbilical hernia	0	12	12	14.5
Burns and scalds	7	4	11	7.2
Benign prostatic hypertrophy	8	0	8	55.7
Duodenal ulcer	5	2	7	23.3
Haemorrhoids	5	2	7	16.0
Phimosis	7	0	7	11.8
Incisional hernia	1	5	6	15.6
Gangrene of toe, feet	5	1	6	86.1
Infections of the urinary tract	3	2	5	
Diverticulitis coli	4	0	4	
Cryptorchidism	4	0	4	
Cellulitis	3	1	4	
Others	78	57	135	
Total	228	132	360	

Table III shows that Inguinal hernia and acute appendicitis were the two most common reasons for admission: 33 cases each. In the former, there was a very marked male preponderance: 32 males to 1 female, and half the patients were below 50 years of age. In the latter condition, there was an almost equal number of males and females. Only one patient was over 50 years, and in fact more than half were under 20 years. The average stay in hospital of patients with hernia was 15 days and of those with appendicitis 14.3 days. All these were operated upon.

30 cases were admitted for closed head injury without fracture and once more a marked male preponderance is noted: 24 males to 6 females. Just over half these patients were children under the age of 12 and the average stay in hos-

pital for the group was 8.6 days. The next group of 18 patients I have placed under the generic heading of "abdominal pain", and is equally divided into males and females. All except 4 were under 30 years. 14 of these patients were referred for appendicular colic or appendicitis, but this was not confirmed and only one was operated on. Each patient was investigated to a greater or lesser extent but no definite cause for the pain was established. The average stay in hospital was 8.6 days.

The fifth commonest group comprised patients suffering from renal or ureteric colic and/or renal or ureteric calculus. There were 13 males to 3 females. 5 of the patients were in their forties and the others were spread in several other age groups. Their average stay in hospital was 14.1 days. The next group, cholecystitis, cholelithiasis and related conditions, contained 14 patients and for the first time one finds a distinct preponderance of females: 10 out of 14. There was a wide scatter of patients throughout several age-groups: the youngest two were 21 years old and the oldest four were in their seventies. The average stay in hospital was 24.3 days. Some of the patients in the last two groups were operated upon while others were treated conservatively and discharged.

Umbilical hernia accounted for 12 patients who were all female. 10 of them were over 30 years and the remaining two were below 6 years. They were all operated upon and their average stay was 15.8 days. Burns and scalds accounted for another 11 patients, 7 of whom were males. All, except one who was 83 years old, were under the age of 22, and their average stay was 7.2 days. This rather low duration is explained by the fact that no less than 6 of these patients had superficial first degree scalds and were healed in 3 to 4 days.

7 patients, 4 of them males, were admitted and operated upon for duodenal ulcer. They were all over 40 and they stayed for 23.3 days on an average. Another 7 patients, 5 male and 2 female, were operated upon for haemorrhoids and stayed for 16 days on an average. 7 more

males were admitted for circumcision and they stayed an average of 11.8 days.

There were 8 men, all over 63 years, who were admitted for benign prostatic hyperplasia and 6 were operated upon. The average stay was 55.7 days. This high figure is partly explained by two patients who developed several complications and stayed 94 and 117 days respectively. Incisional hernia accounted for 6 patients, of whom 5 were female. They were all operated upon and stayed an average 15.6 days in hospital.

The dubious honour of having the longest average stay in hospital, 86.1 days, belongs to the 6 patients who were admitted with gangrenous toes or feet. 5 of them were male and 5 of the 6 were suffering from diabetes mellitus. 5 patients were admitted with infections of the urinary tract, mostly cystitis. There were 4 cases each of diverticulitis coli (all male), cryptorchidism, hydrocele and cellulitis of various regions; 3 admissions each of carcinoma of the breast, carcinoma of the nasopharynx (but only two patients), fractured skull, papilloma of bladder, stricture of the oesophagus (but only one patient), tetanus and varicose veins. There were two admissions each of carcinoma of the bronchus, colon, ovary, pancreas, thyroid, of contusion of the abdominal wall, cystic hyperplasia of the breast, enteritis, fistula in ano, foreign body in elbow (one patient), gastric ulcer, hepatitis, unexplained melaena, pyloric stenosis, thyrotoxicosis, septic finger.

Finally, the following conditions accounted for one patient each: abdominal tumour, anaemia, angioma foot, carcinoma of the anal canal, cheek, prostate, rectum, stomach, cardiospasm, chronic cervicitis, amoebic colitis, ulcerative colitis, contracture of the elbow, contusion of the chest, deep vein thrombosis, diabetic ketosis, duodenal adhesions, epididymo-orchitis, epithelioma of the lip, erysipelas, femoral hernia, fibroma elbow and of sole of foot, fibroadenoma of the breast, fistula of the nipple, foreign body in the hand, ear and wrist, fracture of the medial malleolus, ganglion, gastritis, gout, haemangioma of the lower lip, hiatus hernia, retroperito-

neal haematoma, hidradenitis suppurativa, hydronephrosis, hypospadias, intermittent claudication, labial keratosis, lipoma, liver cirrhosis, cervical and submandibular lymphadenitis, tuberculous cervical lymphadenitis, lymphosarcoma, maxillary tumour, myelitis, granular-cell myoblastoma of the breast, brachial neuralgia, ovarian cyst, paraphimosis, pelvic endometriosis, pain in right hypochondrium, progressive muscular atrophy, prolapse of rectum, prostatitis, pyelonephritis, pyrexia of unknown origin, sequelae of anterior poliomyelitis, septic toe, spermatocele, stab wound of the abdomen, swallowed foreign body, thrombophlebitis, thyroid adenoma, typhoid fever, ulcer of the cheek. Another 11 patients had abscesses in different parts of the body.

Though some of the figures mentioned above, especially for the more common conditions, are of interest and may even show possible trends, it is not possible, for several reasons, to draw conclusions of statistical significance. The average length of stay in hospital for several of the more common conditions would probably be found to vary little even with a larger sample of patients. The preponderance of males in many of the more common conditions goes some way in explaining the more frequent overcrowding in the male ward. An attempt was made to compare the relative incidence of the more common conditions above mentioned and that set out in the annual report for 1964 for St. Luke's Hospital. However, it was found that in several instances a comparison would be impossible. To take an example or two at random, hernia and intestinal obstruction are classified together in the report; and while a total of 360 cases of appendicitis are reported to have been admitted, only 244 appendectomies are recorded. It is probable that several of the patients I included under "abdominal pain" are in fact included under appendicitis in the report.

Of the 360 patients in the survey, 8 died in hospital.

### Diabetic Patients

Table IV shows the age and sex dis-

tribution of the 43 diabetic patients in the survey.

TABLE IV

Age and sex incidence of 43 diabetics	Sex		Total	
	Age in years	M.		F.
	20-24	2	0	2
	30-34	1	1	2
	40-44	1	1	2
	45-49	1	3	4
	50-54	3	5	8
	55-59	2	1	3
	60-64	4	3	7
	65-69	4	1	5
	70-74	4	2	6
	75-79	3	0	3
	80-84	1	0	1
	Total	26	17	43

Of all 360 patients in the survey, 38 were found to give a positive reaction for reducing substances in the urine on routine examination in the ward (Table V).

TABLE V

### Number of Glycosurics in the Survey

	Number of Patients	Number of Diabetics
Glycosuria on R and PP exam. of urine	30	24
Glycosuria on R exam. of urine	38	27
Glycosuria on PP exam. of urine	29	16
Total	67	43

30 of these also showed a positive reaction when the urine was tested two hours after lunch and 24 of the latter were diabetic while 6 were not. Of the remaining 8 patients who did not have a postprandial positive reaction, 3 were diabetic while 5 were not.

Another 29 of the total number of patients showed a positive postprandial reaction but no reaction on routine examination of the urine. 16 of these were diabetic, 11 were not, while two were borderline but possibly diabetic with a postprandial blood sugar of 102 mg. per 100 ml. of blood. However, the last two

patients have been included among the non-diabetic patients. The postprandial blood sugars of the diabetic patients ranged from 109 to 324 mg. per 100 ml. of blood.

**TABLE VI**

**Number of Diabetics in the Survey**

Patients in Survey	360	100%
Non-diabetics	317	88%
Previously known diabetics	23	} 43 12%
Previously unknown diabetics	20	

In all, therefore, 43 patients (12%) were found to be suffering from diabetes mellitus among a total of 360 admissions in three months (*Table VI*). 20 of the 43 patients were not known to be suffering from diabetes mellitus before admission to hospital. 19 of the 23 known diabetics gave a positive reaction on routine testing of the urine but only 10 of the 20 newly discovered diabetics gave a positive reaction in the routine ward test. Hence, it is quite probable that a number of patients not known to be diabetics, are admitted to hospital, have a negative routine urine ward test and are subsequently discharged without the diabetes being discovered. As in other surveys, roughly one previously unknown case of diabetes was discovered for every known one. Even so, the number of diabetics (43) must be an underestimate as only the glycosurics were further investigated. In all but 2 of the 23 known diabetics, the age of onset was over 35 years.

Among the 43 diabetics, 26 were male and 17 female, while all except 4 were over 40 years. The most common condition was gangrene of the toes and/or feet, and of the 5 cases four were men. Three of the patients were in their seventies. There were two cases each of carcinoma of the pancreas with jaundice, cholecystitis, varicose veins and benign prostatic hypertrophy. There was one case of each of the following: appendicitis, brachial neuralgia, burns, carcinoma of the cheek, colon, ovary, stomach, intermittent claudication, concussion, renal colic, enteritis, epididymo-orchitis, erysipelas, fibroma of

the foot, foreign body in the ear, inguinal hernia, hydrocele, incisional hernia, umbilical hernia, inguinal adenitis, diabetic ketosis, hepatitis, myelitis, paraphymosis, phimosis, prostatitis, septic finger and septic toe, stab wound in the abdomen, ureteric calculus.

An attempt was made to find out if the 20 previously unknown diabetics had any symptoms which could have been ascribed to diabetes: 4 stated that they had been suffering from moderate polyuria but the rest denied any symptoms and professed surprise at the diagnosis. The 23 known diabetics were asked if they remembered how the diabetes was first diagnosed. 11 stated that it was discovered on routine examination of the urine for such reasons as antenatal care, medical examination prior to taking on a new job and so on. The others first went to their doctors for such symptoms as polydipsia, polyuria, pruritus vulvae, progressive loss of vision, lassitude.

The 23 known diabetics generally showed a very careless attitude to their diabetes. Only two patients admitted to regular and conscientious treatment with diet and insulin or tablets. 4 patients did not bother to carry out any treatment. Another 4 kept to some sort of a diet only; while 6 more said they took insulin regularly without bothering much about the diet. 4 patients dieted fairly regularly and took insulin now and again; while one patient took a weekly injection of insulin, presumably as a tonic! The remaining two patients controlled their diabetes with sulphanyl ureas.

25 of the 43 diabetics gave a family history of diabetes. "Family" in this context means father, mother, siblings, sons and daughters. 40 such relatives were suffering from diabetes and they included 14 mothers, 3 fathers, 10 brothers, 12 sisters and 1 daughter. Another 11 patients gave no family history of diabetes, while that of the other 7 patients was not recorded. In contrast, only 59 (18.6%) of the 317 non-diabetic patients gave a family history of diabetes. The 68 relatives involved included 35 mothers, 15 fathers, 5 brothers, 8 sisters, 4 daughters and 1 son.

## Weight

Patients were weighed in their hospital clothes and without shoes. Their height was measured at the same time. The figures were then compared with height and weight tables taken from Kem-sley, W.F.F. (1952); Data of Joint Clothing Council (1954); and from the Report on the heights and weights of school pupils (1959). A difficulty arose with regard to the last mentioned table which gives the average height and weight for a given age. Many of the children in the survey were below the average height for their age. Hence, their weight was compared to that of children of the same height in a lower age group. Patients who were more than 10% above average weight were classified as overweight; while those who were more than 10% under average weight were classed as underweight; all others were described as normal.

Only 6 of the patients with closed head injury were overweight. Of the 33 patients with appendicitis, 8 were overweight, 6 were underweight and the other 19 were of average weight. The pattern was somewhat similar with the abdominal pain group: 9 overweight, 4 underweight and 9 average weight. On the other hand, 15 of the 33 patients with inguinal hernia were overweight, 15 were of average weight and 3 were underweight. In the umbilical hernia group, 9 were overweight while the two children and the only diabetic were average in weight. All these 9 patients were grossly overweight and included the record holder who was 107 pounds over the average weight for her height. 9 of the 16 patients in the renal colic group and 9 of the 14 in the cholecystitis group were overweight and almost all the rest were of average weight. The number of patients in the other groups is too small to merit further consideration.

Taking all the 317 non-diabetic patients as a whole (*Table VII*), one finds that 46 (14.5%) were underweight, 148 (46.7%) were of average weight, 118 (37.2%) were overweight and the weight of the remaining 5 was not recorded. Zammit Maempel (1965) states that a

## TABLE VII

### Incidence of Obesity

	Non-Diabetics		Diabetics	
Underweight	46	14.5%	1	2.5%
	23 males		female	
Average Weight	148	46.7%	14	32.5%
	106 males		12 males	
Overweight	118	37.2%	25	58.1%
	71 males		13 males	
Not recorded	5	1.6%	3	6.9%
	3 males		2 males	
Total	317	100%	43	100%

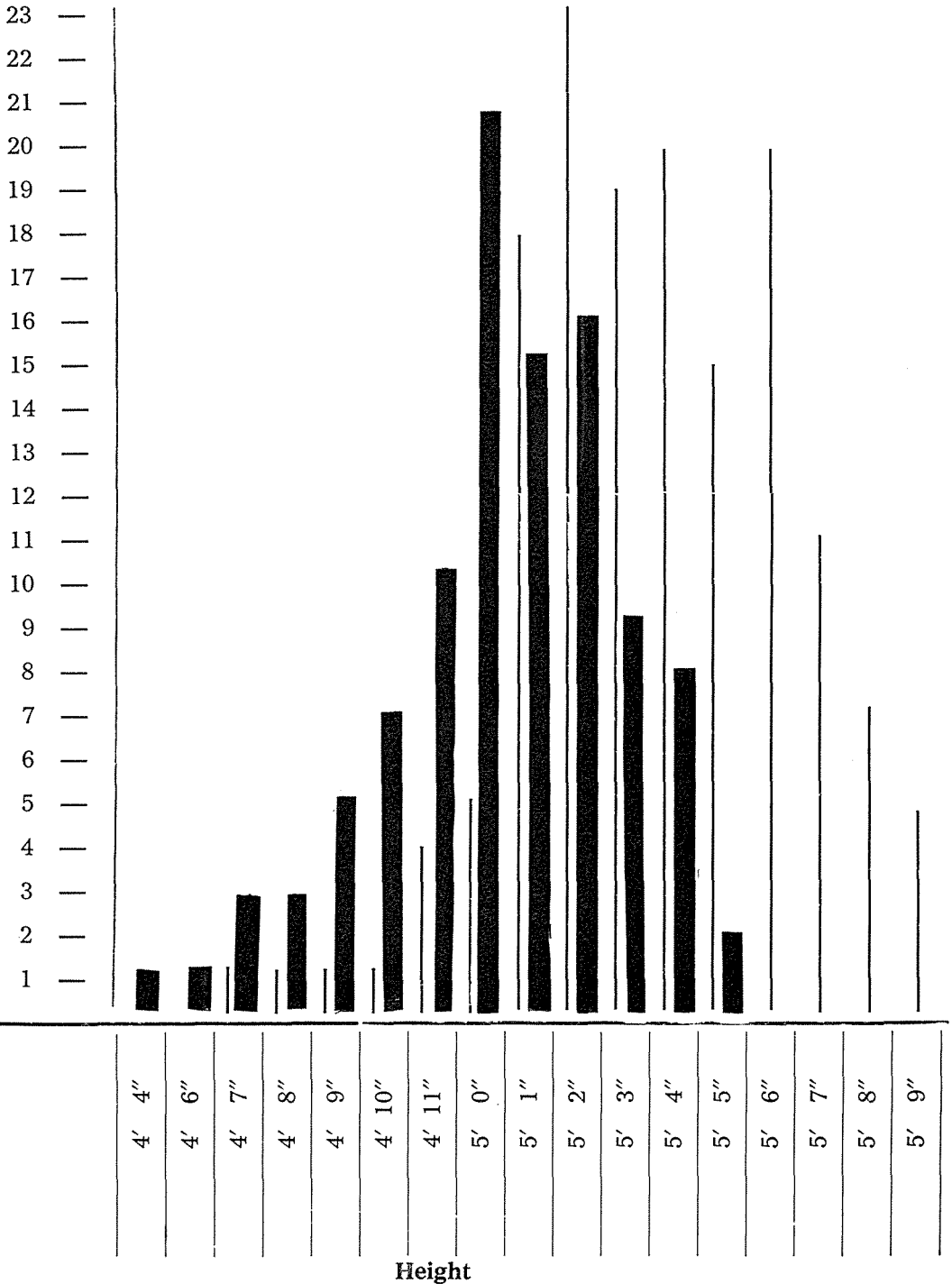
“study of 288 non-glycosuric, non-diabetic controls, 10 years or over, gave 127 (44.1%) overweight, 28 (9.7%) underweight and 133 (46.2%) normal”. The two series are not of course comparable. Even so, however, allowing for the fact that many patients would have lost some weight as a result of their condition, a certain similarity between the two sets of figures emerges. This is also the case when one looks at the figures for the two diabetic groups. In the present survey, the small sample of 43 diabetic patients is divided as follows: 1 underweight, 14 average weight, 25 overweight and 3 unfortunately not recorded. Zammit-Maempel (1965) states that “of 283 confirmed diabetics, 171 (60.4%) were obese, 14 (5%) were underweight and the remaining 98 (34.6%) were normal”. It is interesting to note that 54% of the patients who were underweight and 61% of those who were of average weight were less than 30 years old. On the other hand, 72% of patients who were overweight were to be found between the ages of 30 and 70 years.

## Height

*Table VIII* shows the frequency distribution of heights of all adult patients over the age of 18 years. The range for men is from 4 feet 7 inches to 5 feet 9 inches with the peak at 5 feet 2 inches. The range for women is at a lower level and extends from 4 feet 4 inches to 5 feet 5 inches with the peak at 5 feet. The height of children up to the age of 17 years was

TABLE VIII  
Height Frequency of Patients over 18 years

No. of  
Patients



Thin lines represent males; thick lines females.

compared, as already stated, to height given in the Report on the heights and weights of school pupils (1959). It was interesting to note that up to the age of 8 years the children in the survey more or less held their own with the London schoolchildren: 6 were of average height, 10 were over the average and 14 were under the average. After the age of 8 years, however, the picture radically changes: 10 were of average height, only 2 over the average and no less than 48 were under the average. The numbers are too small for any statistical conclusion to be drawn. But they suggest possible trends which can be followed up in future research.

### Summary

360 patients admitted to two surgical wards over a three month period have been analysed in various respects: age, disease, length of stay in hospital, weight, height, incidence of diabetes. One positive result has been the finding of a number of previously unknown diabetics. It has not been found possible to draw statistically significant conclusions from the figures quoted above, one of the chief reasons being the relative smallness of the numbers. On the

other hand, certain possible trends are suggested and these can serve as a basis for further research.

I wish to thank the Hon. Minister of Health and the Chief Govt. Medical Officer for permission to publish this survey; Prof. A. J. Craig and Mr. J. A. Muscat for very kindly allowing access to the patients under their care; Sister Juliana Pisani, Sister Bernardette Fava and their respective ward staff for their unstinted cooperation in the face of many difficulties; Dr. R. Naudi and Dr. A. Azzopardi for help in collecting the data; Dr. J. L. Grech for laboratory investigations and for technical advice; Prof. A. P. Camilleri and Mr. Maurice Abela for advice on the statistical data and on the preparation of this paper, and Miss Mary Vella from the Record Office of the Surgical Out-patient department for her invaluable help.

### References

- Annual Report for St. Luke's Hospital, 1964. Medical and Health Dept. Malta.  
 Data of Joint Clothing Council 1954. Women's measurements and sizes. London, H.M.S.O.  
 KEMSLEY, W.F.F., (1952). *Ann. Eugen., Lond.*, 16, 316.  
 Report on the Heights and Weights of School Pupils in the County of London in 1959.  
 ZAMMIT-MAEMPEL, J.V., (1965). *Lancet*, 2, 1197.

