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FAMILY MORBIDITY

A SUGGESTED METHOD OF MEASUREMENT

BY

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It is usual to regard the family as a unit with specific attributes rather than as an aggregate of individuals with unrelated attributes. Is this view justified with regard to morbidity? Has a family a constant trend over the years?

The present paper demonstrates a method which may help to answer these questions. It is based on the measurement of morbidity as reflected in consultations with physicians and is exemplified by the experience of 46 families for 2 to 3 years.

THE FAMILIES

The 46 families live in a housing estate for new immigrants in Kiryat Yovel, a Jerusalem suburb. They were selected from the 450 families of the estate in the following way. A stratified sample list of every third family was prepared, the original plan having been to study the whole sample. Preliminary examination of the contacts of some thirty families indicated the desirability of limiting the study to a more detailed analysis of a smaller group. Twenty of these thirty families come from North Africa or Near Eastern countries and it was decided to concentrate on this cultural group. The ten families from other countries were dropped and 26 further families with typical North African names were picked out of the stratified list.

These families immigrated during 1950–52 and belong to lower income groups. Their mean size of 4·8 persons (in 1955), rising to 5·5 persons (in 1957) is similar to the mean of 5·1 persons for Moroccan families in Israel. Most families consist of parents and young children (Table I); some have only one parent and in some cases the parents are older and the children grown up. Analysis has been confined to the nuclear family, as the few grandparents living with their son's and daughter's families seemed to have a different pattern of morbidity, unrelated to that of the family.

TABLE I

THE 46 FAMILIES, 1955–57, BY AGE AND SEX DISTRIBUTION OF FAMILY MEMBERS

Age (yrs)	Year						Total Person-Years	
	1955 (20 families)		1956 (46 families)		1957 (46 families)			
	Male	Female	Male	Female	Male	Female	Male	Female
0– 1	5	5	13	8	7	8	25	21
2– 4	7	10	17	21	20	18	44	49
5–14	12	10	35	27	40	36	87	73
15–59	26	19	61	56	61	57	148	132
60+	1	1	2	2	3	2	6	5
All Ages	51	45	128	114	131	121	310	280

Residents of this housing estate enjoy, together with those of adjacent estates, a high standard of integrated curative-preventive services from the family doctors and nurses of the Hadassah Community Health Centre. Physicians in the Centre record their findings in family files and, in addition, complete a daily consultation sheet (patient's name, age, file number, and diagnosis) for administrative purposes.

USE OF THE CURRENT MORBIDITY RECORDS

Family sheets were prepared from the records, and on these were listed the diagnoses made for each individual member during the year, the number of episodes of disease, and the number of consultations for each diagnosis. For each family, the total number of contacts for all conditions was computed, as well as that for acute respiratory and gastro-intestinal diseases (Annexe I, overleaf). For the first twenty families, the data for 3 years, 1955–57, was extracted from the family files. Data on the next 26 families, for the years 1956–57 only, were taken from the daily consultation sheets of the physicians. There was no significant difference in the mean number of consultations recorded per year in the family files and on

ANNEXE I

EXAMPLE OF ANNUAL FAMILY SHEET

PLACE.....Z..... FAMILY NAME.....A..... COUNTRY OF ORIGIN... MOROCCO

YEAR.....1956..... FILE NO. .....0000..... YEAR OF IMMIGRATION.....1952.....

Relation ... First Name Year of Birth			Husband T. 1930	Wife L. 1932	Son R. 1951	Son S. 1954	Daughter D. 1956 (May)
1956	January		Pain in leg X				
	February			Tonsillitis XX Pregnancy XX		Pyrexia unknown origin X	
	March			Pregnancy X		Bronchitis XXX	
	April			Pregnancy XX			
	June			Post-Partum X			Routine XXX
	July...						Routine XX
	August						Cough X
	October ...		Burn X				Routine X
	December...			Amoebiasis XX			Routine X
Totals	All Consultations	24	2	10	0	4	8
	Respiratory	6	0	2	0	3	1
	Gastro-intestinal...	2	0	2	0	0	0
	Other	16	2	6	0	1	7

X = One doctor consultation.

the consultation sheets and it seems permissible to regard these sources as uniform.

Individual data on all consultations and on those for respiratory and gastro-intestinal diseases were grouped by age and sex and the mean rates per year were calculated (Table II). These mean rates were then taken as the expected rates for the particular age-sex group.

Expected consultation rates of members of each family, added up, became the expected rate for that family for that year. This expected family consultation rate changes from year to year with changes in the number of members and in their ages (Annexe IIB, opposite).

The actual number of consultations of individuals and of the family as a whole (Annexe IIA) divided by the expected value, gave consultation-indices for each individual and for each family (Annexe IIC).

TABLE II

THE 46 FAMILIES 1955–57: ANNUAL RATES OF CONSULTATION PER PERSON AND PERCENTAGE OF PERSONS CONSULTING, FOR ALL CONDITIONS, FOR ACUTE RESPIRATORY, AND FOR GASTRO-INTESTINAL DISEASES, BY AGE AND SEX

Sex	Age (yrs)	All Consultations		Respiratory		Gastro-Intestinal		Other Conditions
		Percentage Persons Consulting	Consultations per Person	Percentage Persons Consulting	Consultations per Person	Percentage Persons Consulting	Consultations per Person	Consultations per Person
Male	Total	79	5·0	55	1·8	28	0·6	2·5
	0–1*	(86)	19·5	(76)*	8·1	(68)*	3·5	(7·9)*
	2–4	95	7·5	79	3·3	55	1·4	2·7
	5–14	79	3·3	53	1·2	19	0·2	1·7
	15–59	73	3·7	46	1·0	19	0·3	2·4
	60+ **	(33)**	(3·1)	(17)	(0·8)	(0)	(0)	(2–3)**
Female	Total	88	7·2	61	1·7	26	0·5	4·9
	0–1*	(90)*	13·5	(62)*	4·4	(62)*	2·9	6·0
	2–4	87	5·9	77	2·2	33	0·6	3·0
	5–14	86	3·7	62	1·7	157	0·2	1·7
	15–59	89	9·5	55	1·4	26	0·5	7·5
	60+ **	(80)**	(3·0)	(20)**	(0·2)	(0)**	(0)	(2·8)**

* The rates for the age group 0–1 years are corrected with regard to the fact that about half of this group were born during a year of study and contributed on the average to only half that year; the percentages of persons consulting are not corrected and therefore represent an underestimate.

** These figures are based on less than 10 "person-years".

ANNEXE II

EXAMPLE OF PROFORMA FOR CALCULATION OF INDICES OF ONE FAMILY

PLACE .....Z..... FAMILY NAME.....A..... COUNTRY OF ORIGIN .....MOROCCO
YEAR.....1955-57..... FILE NO.....0000..... YEAR OF IMMIGRATION .....1952.....

Relationship ... ... First Name ... ... Year of Birth		Husband — T. 1930				Wife — L. 1932				Son — R. 1951				Son — S. 1954				Daughter — D. 1956 (May)				Total Family			
Consultations		T	R	G	O	T	R	G	O	T	R	G	O	T	R	G	O	T	R	G	O	T	R	G	O
A. Observed Number of Consultations	1955	0	0	0	0	7	2	0	5	1	1	0	0	7	1	2	4					15			
	1956	2	0	0	2	10	2	2	6	0	0	0	0	4	3	0	1	8	1	0	7	24			
	1957	2	1	0	1	11	1	3	7	0	0	0	0	2	0	0	2	6	3	2	1	21			
	Total	4	1	0	3	28	5	5	18	1	1	0	0	13	4	2	7	14	4	2	8	60	15	9	36
B. Expected * Number of Consultations	1955	3·7	1	0·3	2·4	9·5	1·4	0·5	7·5	7·5	3·3	1·4	2·7	19·5	8·1	3·5	7·9					40·2			
	1956	3·7	1	0·3	2·4	9·5	1·4	0·5	7·5	3·3	1·2	0·2	1·7	7·5	3·3	1·4	2·7	7·9	2·4	1·7	3·5	31·9			
	1957	3·7	1	0·3	2·4	9·5	1·4	0·5	7·5	3·3	1·2	0·2	1·7	7·5	3·3	1·4	2·7	13·5	4·4	2·5	6·0	37·5			
	Total	11·1	3	0·9	7·2	28·5	4·2	1·5	22·5	14·1	5·7	1·8	6·1	34·5	14·1	6·3	13·3	21·4	6·8	4·6	9·5	109·6	34·4	15·1	58·6
C. Indices A/B	1955																					0·4			
	1956																					0·8			
	1957																					0·6			
	Total	0·4				1				0·1				0·4				0·7				0·5	0·4	0·6	0·6

T = Total. R = Respiratory disease. G = Gastro-intestinal disease. O = Other complaints.
* Expected according to Table of Averages of consultations by age and sex, for children born during the year, with correction according to number of months alive in that year.

In this way, the following indices were calculated:

(1) For each Individual:
All consultations during the whole period.

(2) For each Family:
(*a*) All consultations for every year;
(*b*) Consultations for respiratory diseases for the whole period;
(*c*) Consultations for gastro-intestinal diseases for the whole period;
(*d*) All consultations (other than *b* and *c*) for the whole period.

Application of Indices

Three illustrative questions may be asked to indicate the use of the indices:

(1) *Have members of a family a common trend in the numbers of their individual consultations?*

The distribution of individual indices by family for the 46 families is shown in Fig. 1. The following points were observed:

Nine with all individual indices below 1·0.

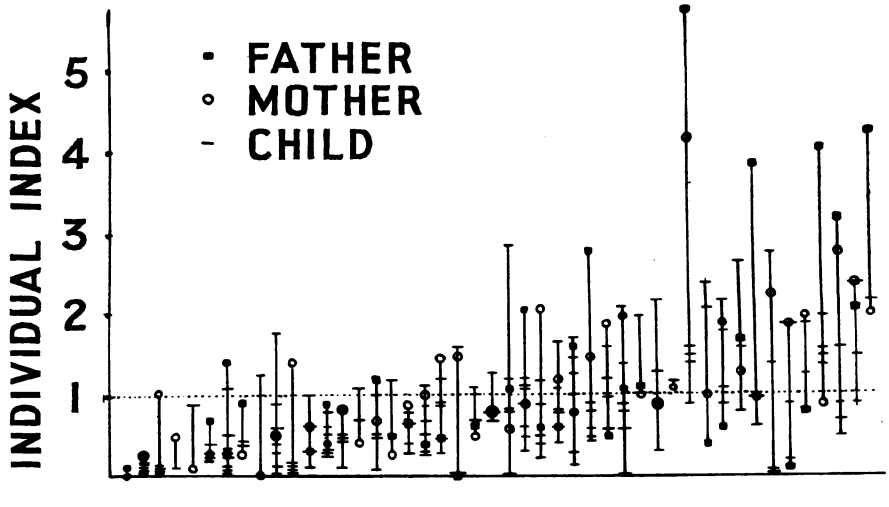


FIG. 1.—Distribution of individual indices by family (total consultation).

Two with all individual indices above 1·0.

Of 35 families whose indices crossed the 1·0 line:

Eight had all individual indices within an interval of one index unit.

Twenty had two-thirds or more of their indices within the space of one unit.

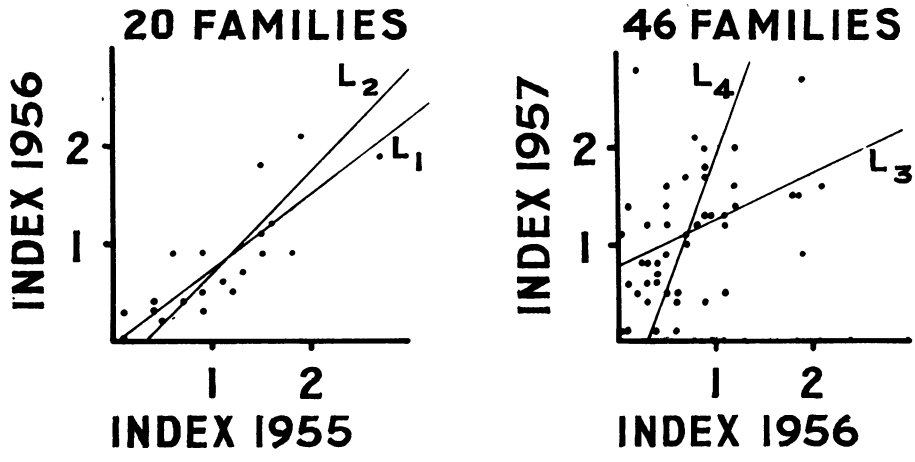
Seven remaining showed more divergent values.

(2) *Has a family a constant trend in the pattern of its consultations over the years?*

Fig. 2 shows the correlation of the indices of the first twenty families for 1955 and 1956 and for all 46 families for 1956 and 1957.

The corresponding coefficient of correlation is $r = +0{\cdot}85$ for 1955–56 and $r = +0{\cdot}45$ for 1956–7.

The distribution of the annual indices of each family is illustrated in Fig. 3.

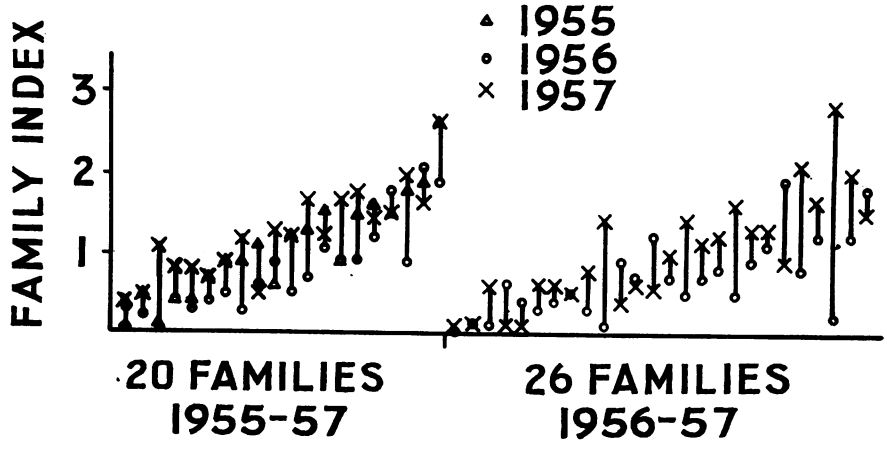


Equations of Lines of Regression

L_2 $y = 0{\cdot}79 + 0{\cdot}75\,(x - 1{\cdot}08)$ L_4 $y = 1{\cdot}11 + 0{\cdot}54\,(x - 0{\cdot}73)$

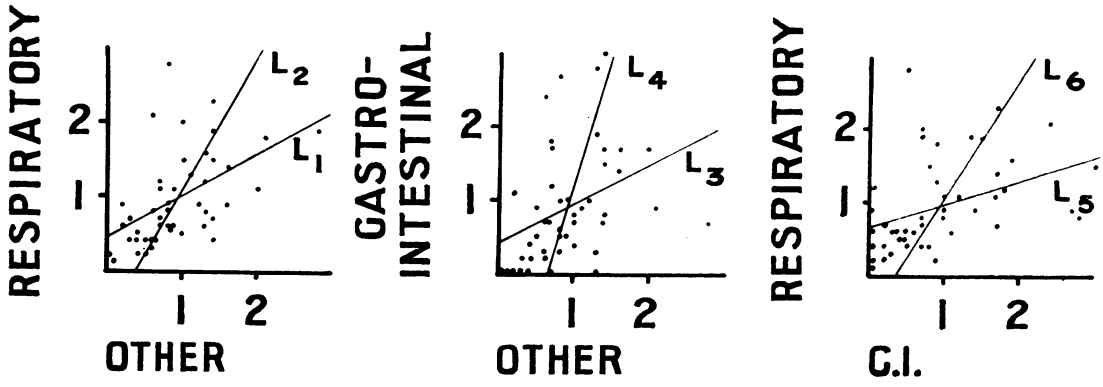
L_2 $x = 1{\cdot}08 + 0{\cdot}96\,(y - 0{\cdot}79)$ L_4 $x = 0{\cdot}73 + 0{\cdot}37\,(y - 1{\cdot}11)$

FIG. 2.—Distribution of annual family indices by year (total consultation).



Each line represents one family

FIG. 3.—Correlations between family indices for different diagnostic groups.



Equations of Lines of Regression

L_1 $y = 0{\cdot}95 + 0{\cdot}58\,(x - 0{\cdot}92)$ L_4 $x = 0{\cdot}92 + 0{\cdot}27\,(y - 0{\cdot}91)$
L_2 $x = 0{\cdot}92 + 0{\cdot}56\,(y - 0{\cdot}95)$ L_5 $y = 0{\cdot}95 + 0{\cdot}30\,(x - 0{\cdot}91)$
L_3 $y = 0{\cdot}91 + 0{\cdot}53\,(x - 0{\cdot}92)$ L_6 $x = 0{\cdot}91 + 0{\cdot}58\,(y - 0{\cdot}95)$

FIG. 4.—Correlation between family indices for different years (total consultation).

(3) *Are there "consultation-prone" families, independent of specific disease groups?*

Certain correlations for the 46 families are illustrated in Fig. 4.

The correlation coefficient for the family indices between consultations for respiratory and gastro-intestinal diseases is $r = +0{\cdot}42$, between respiratory and all other diseases is $r = +0{\cdot}57$, and between gastro-intestinal and all other diseases is $r = +0{\cdot}37$.

COMMENT

The purpose of this paper is to illustrate an approach to the measurement of family morbidity data rather than to answer specific questions. The method has been worked out for a small number of families by way of demonstration. There may well be no general answer to such questions, the results differing with family circumstances.

Family indices of morbidity may be used for picking out particular groups for further study or for special care, *e.g.* those with high or low consultation rates for a specific disease or for all diseases.

This method may also be used in the study of individual morbidity by comparing individual indices for various diagnoses and looking for correlations between them.

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