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# AGE AT MENARCHE IN WARSAW GIRLS IN 1965

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THE few data pertaining to the age at menarche in Poland originate from the examinations of small groups of girls. Discrepancies in the results suggest that these groups were specially selected in various ways. The present paper reports on the results of examinations of a random sample of 3918 Warsaw girls carried out from mid-January to the end of March in 1965.

Many earlier investigations utilized the age at menarche as remembered by the girl or the woman. The age at menarche was calculated as an arithmetic mean on the basis of these data. With this procedure one must remember that the persons examined might have given, intentionally or unintentionally, false dates. What is more, if investigations of this type are carried out in groups of girls who are not fully mature, the absence of data from girls maturing later causes an erroneous lowering of the mean age at menarche.

The probit method used in recent years avoids these dangers. The starting material in this method is represented by the proportions of girls who are menstruating in the various age groups. The distribution, the mean and other characteristics of the age at menarche can then be determined. This method of collecting data was used in our investigations.

The sample of Warsaw girls investigated was selected in the following manner. Twenty-one primary schools, eight general-education secondary schools and fifteen technical secondary schools were drawn at random from the list of all Warsaw schools. In these schools one of the forms of each age group (about 20 girls) was investigated, beginning with the third form of the primary school. If a form had less than fifteen girls, the girls in a second form of the same age group were also investigated.

A total of 3918 girls aged  $8\frac{1}{2}$  to 19 years was concerned: of these 2080 were between 11.0 and 16.0. The wide limits used were in order to detect possible cases of very early or very late menstruation.

The investigation was carried out by three ladies trained for the

purpose, who used a questionnaire asking for the date of birth, and whether the girl was menstruating already or not. Menstruating girls were also asked about the date of the menarche, but we did not insist if a girl could not remember it. The age of the girls at the time of the

TABLE 1  
*Percentage of girls menstruating at each 3 months of age*

AGE, YR.	AGE-GROUP		NON-MENSTRUATING		MENSTRUATING	
	CENTERS, YR.	NUMBER OF GIRLS	Number	%	Number	%
8.46-		376	376	100.0	0	0.0
9.96-		200	200	100.0	0	0.0
10.46-	10.58	93	93	100.0	0	0.0
10.71-	10.83	120	118	98.3	2	1.7
10.96-	11.08	90	88	97.8	2	2.2
11.21-	11.33	88	83	94.3	5	5.7
11.46-	11.58	105	95	90.5	10	9.5
11.71-	11.83	111	94	84.7	17	15.3
11.96-	12.08	100	84	84.0	16	16.0
12.21-	12.33	93	64	68.8	29	31.2
12.46-	12.58	100	61	61.0	39	39.0
12.71-	12.83	108	57	52.8	51	47.2
12.96-	13.08	99	52	52.5	47	47.5
13.21-	13.33	106	39	36.8	67	63.2
13.46-	13.58	105	24	22.9	81	77.1
13.71-	13.83	117	29	24.8	88	75.2
13.96-	14.08	98	19	19.4	79	80.6
14.21-	14.33	97	7	7.2	90	92.8
14.46-	14.58	120	7	5.8	113	94.2
14.71-	14.83	102	7	6.9	95	93.1
14.96-	15.08	122	5	4.1	117	95.9
15.21-	15.33	111	4	3.6	107	96.4
15.46-	15.58	94	2	2.1	92	97.9
15.71-	15.83	114	2	1.7	112	98.2
15.96-19.20		1049	0	0.0	1049	100.0

investigation was calculated to the nearest month, but in further elaborations the girls were grouped in three-month classes, centred as shown in Table 1.

#### *Probit Analysis*

Table 1 contains the numbers of girls investigated in the various age groups, and the numbers and proportions of menstruating and non-

menstruating girls. It can be seen from these data that no girl younger than 10.7 years menstruated, while all girls over 16.0 were menstruating.

A probit analysis of the data was carried out. The probit regression line is given by the equation  $Y = 0.879(X - 13.12) + 5.09$  where  $Y$  is the probit of the proportion menstruating and  $X$  the age in years. The mean age at menarche is  $13.01 \pm 0.04$  years. The standard deviation is 1.4 years. Chi square is 20.1 for 21 degrees of freedom, indicating an excellent fit.

This result is consistent with those obtained in other countries during

TABLE 2

*Frequency distribution of the recollected age at menarche of Warsaw girls aged 16 to 19 years*

AGE AT MENARCHE, YR.	NUMBER OF GIRLS
9.5-	2
10.0-	5
10.5-	10
11.0-	25
11.5-	48
12.0-	92
12.5-	144
13.0-	195
13.5-	169
14.0-	105
14.5-	64
15.0-	28
15.5-	22
16.0-	8
16.5-	6
17.0-	2
Total	925

the last decade (see Tanner, 1962). For example the average age at menarche in the United States of America in the years 1940-1955 was between the limits of 12.5 and 13.0 years, depending on the socio-economic environment and geographical situation. Investigations carried out in large British cities yielded the following results: Edinburgh in 1952, 13.4 years, Bristol in 1956, 13.2 years and London in 1959, 13.06 years. The more recent European data, tabulated by Tanner (1965) range from a mean of 12.8 in Budapest girls to 13.1 in Copenhagen girls.

In the light of these figures the validity of the results recently published by Zukowski *et al.* (1964) for Polish girls in Wrocław must be seriously questioned. The value of 12.6 as compared with 13.0 for Warsaw seems improbable, the more so in that other indices of development such as the age of the height spurt clearly point to retardation of Wrocław girls in comparison with those from Warsaw. We must therefore suppose that the sample of Zukowski *et al.* was not a truly random one, despite the precaution in sampling that they mention in their paper.

#### *Recollected age data*

In our investigations all girls over 16 years of age were already menstruating. Of them, 925 said they remembered the date of the first menstruation. Table 2 shows the frequency distribution of the recollected age at menarche. It is interesting, and perhaps significant, that 7 of these girls alleged that menstruation began before the lower limit observed in the probit analysis questioning, and 16 after the higher limit. The former at least may represent errors of recollection. The mean age at menarche calculated from these data amounts to 13.21 with a standard deviation of 1.13.

The fact that the mean age for this group is 0.2 years higher than the age calculated by the probit method is due in our opinion to the group of older girls containing a considerable number of girls over 18 years of age, who ought to have already completed their secondary schooling. It may be assumed that these are specially selected girls, delayed in their biological development. In order to check this we divided the girls investigated into a group attending general-education secondary school and a group attending technical secondary school. Each of these two groups was then divided into younger girls, aged 16-17 years, and older girls, aged 18 and over.

The number of girls in the various groups, the mean, the standard deviation and the standard error of the mean age at menarche are presented in Table 3.

TABLE 3

*Menarcheal age calculated from recollected data  
of girls aged 16 and over*

	N	AGE 16 OR 17 Mean $\pm$ S. E.	N	AGE 18 OR OVER Mean $\pm$ S. E.
General education	223	12.79 $\pm$ .08	99	13.26 $\pm$ 0.11
Technical education	305	12.96 $\pm$ .06	291	13.73 $\pm$ .07

Both in general-education and technical secondary school the mean age at menarche in older girls who stay at school beyond the normal period is higher than in younger girls. There is evidently a retardation in the biological development of these girls. The lower age at menarche in girls attending general-education schools is probably caused by their higher living standard.

## SUMMARY AND ABSTRACT

Menarche age has been investigated by the probit method in a random sample of all girls in Warsaw schools in 1965. A total of 3918 girls were interrogated by three trained persons: 2080 girls were between 11.0 and 16.0 years. The median menarcheal age was  $13.01 \pm 0.04$ . None of 669 girls under 10.7 was menstruating and all of the 1049 girls over 16.0 were menstruating. Girls over 16.0 were asked for their recollected age at menarche; 925 responded, giving a mean of 13.2 years. The higher mean is probably due chiefly to the fact that the girls over 18 in this sub-population are a specially selected sample, since by this age they ought to have left the school system. Girls still in school at age 18 and over had a recollected age of menarche about 0.6 year higher than girls still at school at ages 16 and 17. Girls in general-education secondary schools had a lower age of menarche than those in technical secondary schools.

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