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Body height and mass of girls from rural communities in Krosno region as affected by political and economical changes in Poland in the period 1977–1997*

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ABSTRACT Body height and mass were determined in girls aged 10.5-18.5 years in three periods: 1977 (n = 1028), 1987 (n = 1255) and in 1997 (n = 1992). The families of those girls were classified into three categories: farmers, farmer-workers and non-farmers. The economical crisis affected predominantly the rural non-farmer population while farmers were most independent from food rationing. After the change of the system and after the state-owned and co-operative farms had been dissolved, the economical situation of the rural non-farmer population worsened further, which showed in the biological parameters of girls.

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Introduction

The study was conducted three times, in the years 1977, 1987 and 1997, thus covering two decades, very different from one another with respect to the political system and the socio-economical situation of the population. The first decade (1977-1987) was characterised by a heavy economical crisis, which included shortages in all kinds of products and rationing of food and other articles. That crisis brought about biologically adverse effects in the development of children and youths, like arresting the increasing stature and adolescence rate trends, but children from various agglomerations and of various ages were affected to varying degrees [HULANICKA 1992; ŁASKA-MIERZEJEWSKA, ŁUCZAK 1993].

The profound political and socio-economical changes, which took place in the period 1987-1997, proved tough for the rural population. The social categories mentioned below were also unevenly affected by those changes since the liquidation of state-owned and of co-operative farms brought about unemployment of a great fraction of rural population.

I initiated the first stratified studies on rural population in Poland in that very region in 1967. At that time, two categories were discerned: farmers and other inhabitants of villages. As the biological criterion of assessing the socio-economical stratification the age at menarche was selected as a highly eco-sensitive trait which responds to even slight alterations in the living conditions. In a

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sample of 1134 girls, aged 11.5-18.5 years, a marked difference in the age at menarche was found between the two social categories. The daughters of farmers started menstruating at the age of 14.50 ± 1.15 while the other ones – at 13.84 ± 1.30. This suggested that the socio-economical stratification in rural areas in that region was sufficiently high to produce biological effects reflected by significant differences in the adolescence rate of girls. Those results prompted me to extend the study over 6 other regions and to include measurements of body height and mass of girls.

The studies in other regions of Poland were continued in the years 1967-68 but at that time three socio-occupational categories were discerned:
– Farmer families, whose only income was from own farms;
– Farmer-worker families, whose sources of income were smallholder farms and off-farm employment of one or more family members;
– Non-farmer families, inhabiting villages but owning no land.

The studies were repeated in 8 regions of Poland in the seventies and eighties. The results invariably showed that girls from farmer families were shortest, lightest and started menstruating latest. On the opposite end were girls from the non-farmer families.

In the sixties, the girls from farmer families had their menarche by 0.53 years later than those from non-farmer families. That difference amounted to 0.44 years in the seventies and to 0.31 years in the eighties. Those results prove that the living standard of principal food producers in Poland during the so-called socialist period was lowest when compared with other social classes.

Those results explain the steady escape from farming as the only means of income. The percentage fraction of rural population diminished from decade to decade giving rise to that owning no land [ŁASKA-MIERZEJEWSKA 1968, 1970, 1971, 1983; ŁASKA-MIERZEJEWSKA, ŁUCZAK 1993; ŁUCZAK, ŁASKA-MIERZEJEWSKA 1991].

Only in the Krosno region it was possible to carry out another study in the nineties.

The aim of this study was an attempt at clarifying the following questions:

– Whether the systemic changes which took place in Poland on the turn of eighties and nineties affected the socio-economical situation of rural population and, in consequence, the stature and body mass of rural girls;

– Whether the increasing secular trends of stature and body mass, arrested in the critical decade 1977-1987 and even reversed in girls 10.5-11.5 years old, have been resumed and to what degree;

– Whether social variables, like socio-occupational status, education of fathers and mothers, and number of children per family, affect the stature and body mass of girls;

– Whether the dominance of the population of Warsaw girls over the rural one from Krosno region, with respect to body height and mass, undergoes changes and in what direction.

Materials

In the years 1996-97, body height, body mass and age at menarche were again determined in girls from rural population of the Krosno region. A total of 1992 girls, aged from 10 to 18 years,

were studied in the same 4 communes (Dukla, Iwonicz, Rymanów, Wojaszówka) as in earlier studies, as well as in two new ones (Olszanica, Lesko). The latter two communes were included in search of girls from farmer families. However, the numbers of girls from the farmer, farmer-worker and non-farmer families were 200, 994 and 798, or 10, 50 and 40%, respectively.

In elementary village schools, all girls attending grades 4-8 were included in the study. In secondary schools, only the girls from villages were studied. All kinds of secondary schools (general, technical, and vocational) were included, as the students of those schools are known to differ in somatic traits. It was demonstrated by OLSZEWSKA [1999] that students of general schools preparing for graduation were taller and heavier than their mates of technical, and still more than those of vocational schools. Unfortunately, very few girls from farmer families were found among those from general schools. Most girls of that provenience attended vocational schools so it could have happened that in some age groups predominated girls from that type of schools.

Apart from biological traits, also the education of fathers and mothers was recorded, as well as the number of children in the family, and household equipment.

The age at menarche of those girls was determined by the probit technique and was reported elsewhere [ŁASKA-MIERZEJEWSKA 1997].

Body height and mass of girls under study were compared with the respective data for the population of Warsaw in consecutive decades [CHARZEWSKI 1981; HULANICKA *et al*. 1992; NIEDŹWIECKA, PALCZEWSKA 1999].

Results and discussion

1997 studies

As follows from data presented in Tables 1-3, the socio-occupational categories differed from each other in all social variables studied, i.e. education of fathers and of mothers, number of children per family and household equipment.

Among fathers, vocational education was the most frequent one, the elementary level being recorded in 39.0, 18.5 and 11.5% in the categories of farmers, farmer-workers and non-farmers. With regard to secondary or higher education, the above trend was reversed.

Among mothers, also the vocational education dominated. Only in the non-farmer category as many as 40.6% had secondary education. In all socio-occupational categories, the percentages of mothers having secondary or higher education were higher than the corresponding ones of fathers. Secondary and higher education was combined in one category for both fathers and mothers as shown in Figs. 5-8.

In consecutive studies, steady rises in the education of parents were observed. In the years 1977, 1987 and 1997 (the present study), the percentages of fathers having elementary education were 57.6, 33.6, and 17.8%. The contribution of vocational education steadily increased from 28.5% in 1977 to 58% in 1997. Also the percentages of fathers having secondary or higher education increased over that period from 13.7% (1977) to 23.3% (1997) as reported earlier [ŁASKA-MIERZEJEWSKA 1997].

The average number of children per family proved highly stable over the 20-year period. Half of the families studied had 3-4 children, 27.5-30% of families had 1-2 children, and the remaining ones,

Table 1. Father's and mother's education in socio-occupational groups (source of income)

	Source of income							
	Farmers		farmer-workers		non-farmers		Total	
Education	N	%	N	%	N	%	N	%
			Father's education					
Elementary	78	39.0	184	18.5	92	11.5	354	17.8
Vocational	96	48.0	599	60.3	461	57.8	1156	58.0
Secondary	20	10.0	189	19.0	188	23.6	397	19.9
Higher	1	0.5	19	1.9	47	5.9	67	3.4
Total *	200	10.0	994	49.9	798	40.1	1992	100.0
			Mother's education					
Elementary	78	39.0	230	23.1	127	15.9	435	21.8
Vocational	87	43.5	414	41.7	284	35.6	785	39.4
Secondary	34	17.0	313	31.5	324	40.6	671	33.7
Higher	1	0.5	36	3.6	60	7.5	97	4.9

Total ***** = all individuals investignated; from among this numbers 18 girls was not able to give the information about father's education and 4 girls about the mother's.

Table 2. Family size in socio-occupational groups (source of income)

	Source of income							
	Farmers		farmer-workers		non-farmers		Total	
Number of children	*N*	%	*N*	%	*N*	%	*N*	%
1	4	2.0	40	4.0	54	6.8	98	4.9
2	23	11.5	253	25.5	239	29.9	515	25.9
3	48	24.0	281	28.3	264	33.1	593	30.0
4	47	23.5	211	21.2	128	16.0	386	19.4
5	32	16.0	116	11.7	56	7.0	204	10.0
6	26	13.0	42	4.2	38	4.8	106	5.3
7 and more	20	10.0	51	5.1	19	2.4	90	4.5

Table 3. Household equipment owned in socio-occupational groups (source of income)

	Source of income											
	Farmers			farmer-workers			non-farmers			Total		
Equipment	yes	%	no	yes	%	no	yes	%	no	yes	%	no
1 running water	157	78.5	43	844	84.9	150	683	85.6	115	1684	84.5	308
2 hot water	135	67.5	65	796	80.1	198	665	83.3	133	1596	80.1	396
3 gas	161	80.5	39	910	91.6	84	727	91.1	71	1798	90.3	194
4 deep freeze	165	82.5	35	878	88.3	116	628	78.7	170	1671	83.9	321
5 tv-color	167	83.5	33	926	93.2	68	767	96.1	31	1860	93.4	132
6 video	87	43.5	113	603	60.7	391	525	65.8	273	1215	61.0	777
7 washing machine	97	48.5	103	647	65.1	347	580	72.7	218	1324	66.5	668
8 car	89	44.5	111	613	61.7	381	479	60.0	319	1181	59.3	811
1+2+3	108	54.0	92	702	70.6	292	575	72.1	223	1385	69.5	607
4+5+6	78	39.0	122	548	55.1	446	452	56.6	346	1078	54.1	914
4+5+6+7+8	41	20.5	159	347	34.9	647	299	37.5	499	687	34.5	1305

i.e., 19-21%, had 5 or more children. A rather pronounced differentiation of the three socio-occupational categories with regard to the model of family was noted, the most numerous families being most frequent in the farmer category and the least numerous ones – in the non-farmer category (cf. Table 2).

Families from those three categories differ also regarding their wealth level as reflected by household equipment and facilities presented in Table 3. Again, a distinct gradient of wealth can be noted which is best seen when considering many or all goods combined. Only 20% of farmer families owned all listed goods while that percentage of non-farmer families was as high as 37.5%.

It is worth recalling the observation of ŁASKA-MIERZEJEWSKA, ŁUCZAK [1993] who found that when from the three socio-occupational categories only those families were selected which owned all goods listed, the between-category differences in the age at menarche disappeared. This shows that a high standard of living is the factor, which equalises the rate of adolescence.

Source of income

Taking into account the abovementioned better education of parents, less numerous families and better equipped households, the girls from non-farmer families would be expected to exhibit higher biological indices compared with other socio-occupational categories as was observed in earlier decades.

In 1977, the girls from non-farmer families were taller from their mates from the category of farmers by 1.6 cm in the prepubertal period (10.5-11.5 years of age), by 1.9 cm in the pubertal period (12.5-14.5 years of age) and by 0.4 cm in the postpubertal period (15.5-18.5 years of age).

In 1987, those differences were considerably smaller and amounted to 0.9, 0.5 and 0 cm, respectively. Girls from the non-farmer families were also taller and heavier than their mates from the farmer-workers category. The results mentioned above pertain to an overview of the 8 regions studied [ŁASKA-MIERZEJEWSKA, ŁUCZAK 1993].

As evidenced by data recorded in girls from the Krosno region in 1997, those from non-farmer families have lost their somatic dominance over their mates from other groups (cf. Tables 4, 5, and Figs. 1, 2) and in age classes 10.5, 11.5 and 13.5 are even inferior to those from farmer and farmer-worker families. However, the body height and mass curves of girls from farmer families deviate from the normal ones due to small numbers of those girls attending secondary schools.

In girls from non-farmer families, their menarche occurred later in both decades – 1977-87 and 1987-97, the delay amounting to 0.28 and 0.08 years, respectively. On the other hand, in farmer-workers and farmers, the menarche was in the last decade (1987-97) accelerated by 0.28 and 0.50 years, respectively. The age at menarche is a stronger and more sensitive indicator of changes in the living standard than is either height or body mass. Therefore, the critical decade 1977-87 brought about a delay in girls from non-farmer families both in the Krosno region (by 0.28 years) and in 7 other regions studied. Food rationing in that decade, introduced due to acute food shortages, affected primarily the rural non-farmer population, the other two categories being in a privileged position in that respect as they produced food. This was reflected in anthropological indices of living standard as well as in the indices reported by the Central Statistical Office [ŁASKA-MIERZEJEWSKA, ŁUCZAK 1993].

Table 4. Height of girls and source of income

	Source of income											
	Farmers			farmer-workers			non-farmers			Total		
Age	N	M	SD	N	M	SD	N	M	SD	N	M	SD
10.5	15	143.0	7.16	132	140.9	6.80	118	141.4	7.09	265	141.2	6.94
11.5	37	146.5	7.76	154	145.7	7.18	100	144.9	7.12	291	145.5	7.23
12.5	28	150.8	8.31	173	152.9	6.95	138	152.9	7.20	339	152.8	7.17
13.5	24	158.0	6.89	144	157.5	7.14	112	156.1	5.92	280	157.0	6.67
14.5	25	159.1	4.76	139	160.2	5.47	99	160.1	5.66	263	160.0	5.47
15.5	16	157.7	6.03	61	163.2	5.66	51	162.0	6.23	128	162.0	6.14
16.5	26	163.8	5.55	85	162.6	5.66	73	162.4	6.39	184	162.7	5.93
17.5	21	160.4	4.89	82	163.3	6.00	74	162.8	6.47	177	162.7	6.11
18.5	8	161.4	4.94	15	163.7	6.42	21	162.7	4.83	44	162.8	5.37

Table 5. Weight of girls and source of income

	Source of income											
	farmers			farmer-workers			non-farmers			Total		
Age	N	M	SD	N	M	SD	N	M	SD	N	M	SD
10.5	15	34.2	6.46	132	33.3	7.17	118	33.8	6.90	265	33.6	7.00
11.5	37	35.1	5.18	154	36.3	7.09	100	35.2	7.04	291	35.8	6.86
12.5	28	38.9	8.22	173	41.5	8.20	138	42.1	8.44	339	41.5	8.32
13.5	24	45.9	8.26	144	46.9	10.27	112	45.2	8.67	280	46.1	9.50
14.5	25	49.6	6.14	139	50.2	8.18	99	50.6	8.37	263	50.3	8.06
15.5	16	48.9	6.18	61	55.9	9.42	51	54.6	10.58	128	54.5	9.77
16.5	26	59.1	11.29	85	56.7	6.89	73	55.7	7.56	184	56.6	7.93
17.5	21	59.6	9.74	82	56.9	7.64	74	56.9	7.59	177	57.3	7.89
18.5	8	58.1	7.77	15	56.8	6.01	21	57.0	8.10	44	57.2	7.23

As part of the socio-political changes in Poland, the state-owned and co-operative farms were liquidated which brought about unemployment, most acute for non-farmer families. This was soon reflected in biological variables in girls by markedly reducing the distance between those from non-farmers and other families. Namely, in 1977, girls from non-farmer families started menstruating by a year earlier than those from farmer families while in 1997 that difference was only 0.1 years. This can be called a levelling action of poverty.

Education of parents

Three categories of education were distinguished: elementary, vocational, and secondary and higher combined. Daughters, whose both parents fell in the highest education category, were taller and heavier than their mates whose parents had vocational or only elementary education (Figs. 3-6). Daughters of the latter ones were shortest and lightest. Daughters from lowest age classes, whose both parents had vocational education, were, somatically, close to their mates whose parents had elementary education while older ones – to those from the highest category.

Extreme groups of fathers' education differed from 0.5 to 3.5 cm in body height and from 0.7 to 3.0 kg in body mass. Somewhat smaller differences were observed when mothers' education was considered.

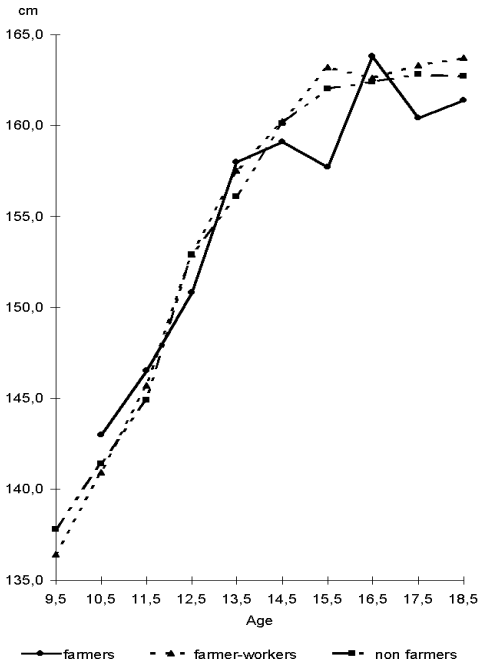

Fig. 1. Height of girls and source of income

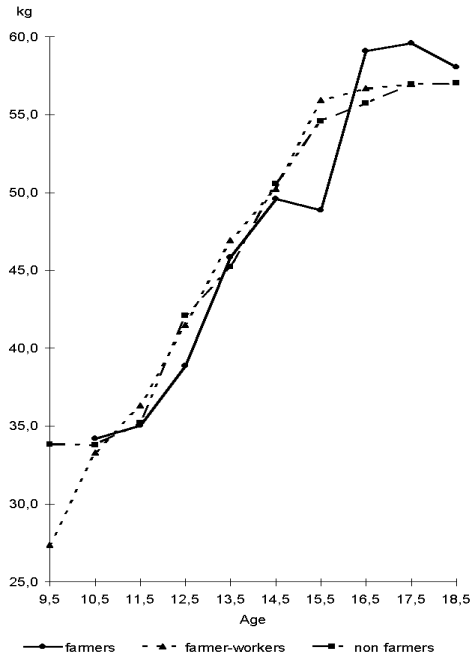

Fig. 2. Body mass of girls and source of income

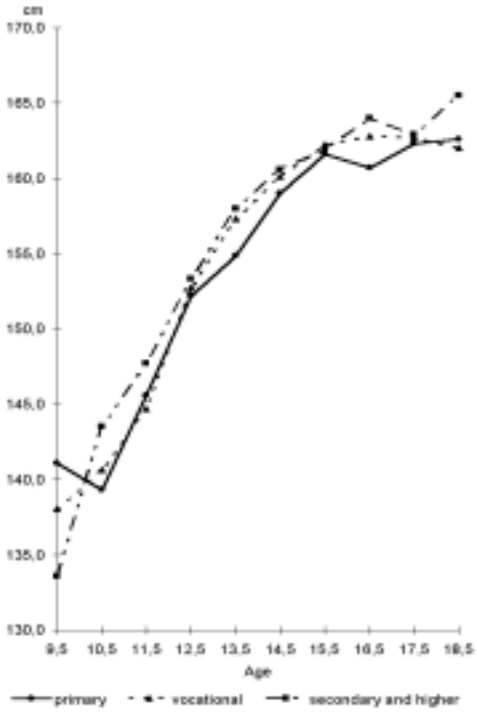

Fig. 3. Height of girls and father's education

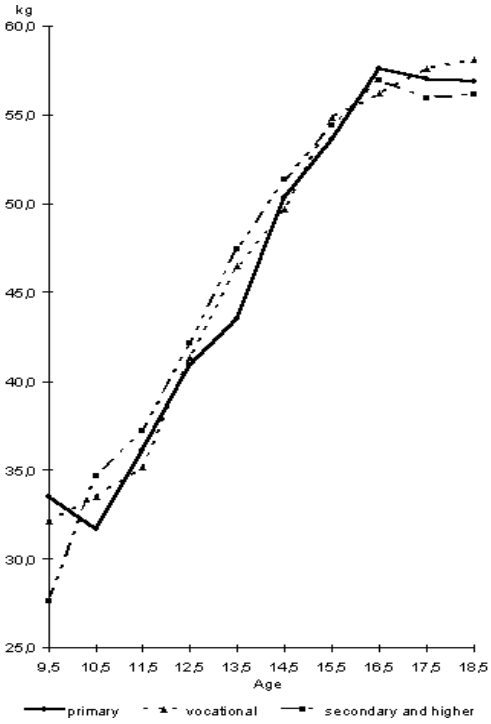

Fig. 4. Body mass of girls and father's education

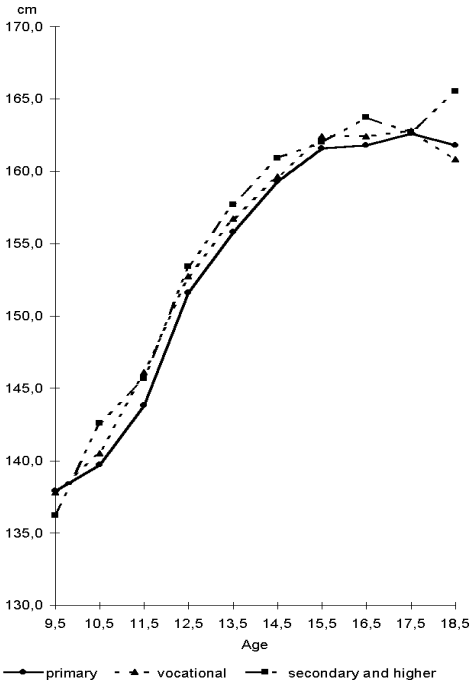

Fig. 5. Height of girls and mother's education

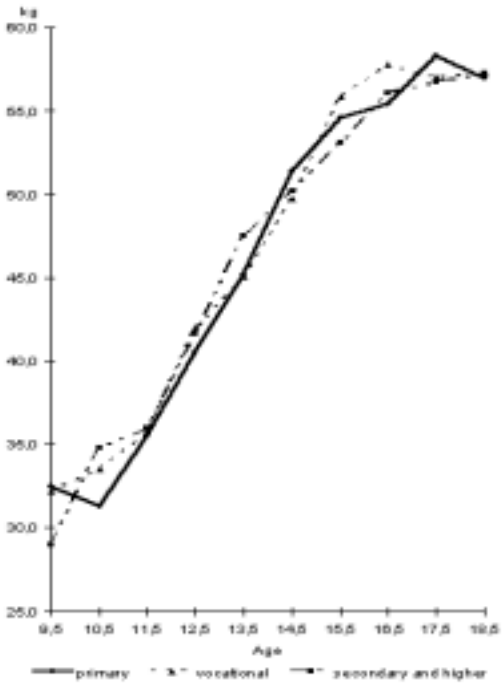

Fig. 6. Body mass of girls and mother's education

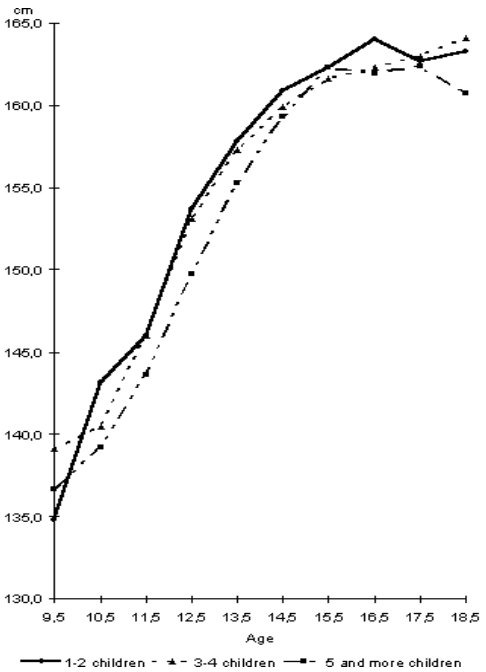

Fig. 7. Height of girls and family size

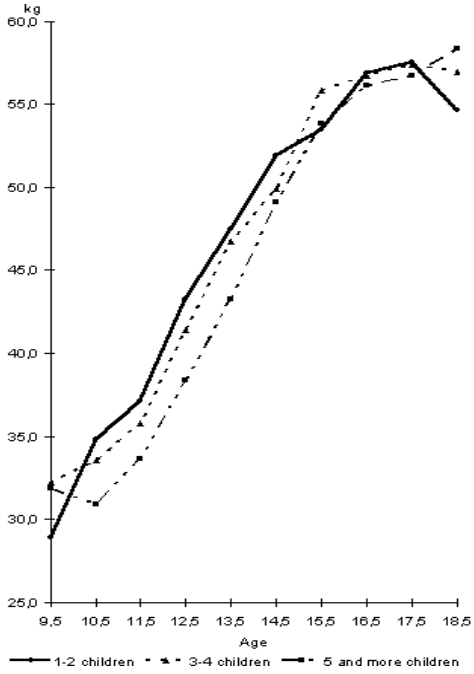

Fig. 8. Body mass of girls and family size

Differences in body height and mass between groups formed according to the education of both parents separately, observed in this study as well as in earlier surveys on rural population, are well pronounced both in the pre-pubertal and pubertal periods. A marked reduction of those differences in the post-pubertal period suggests that they were due to an earlier maturation of girls from families of highest educational status.

In 1977, the age at menarche of girls whose fathers had secondary or higher education, was 12.86 years, and of those whose fathers had only elementary education – 13.67 years. That difference (0.81 years) diminished in the two consecutive decades to 0.43 years in 1987 and 0.11 years in 1997. In those two decades, menarche appeared by 0.40 and 0.16 years, respectively, later in girls from the highest educational category [ŁASKA-MIERZEJEWSKA 1997]. This evidences a marked worsening of the economical situation of educated people from rural population, mainly of non-farmers.

Family size

Body height and mass of girls were the lower the more children were in their families (Figs. 7, 8). This was particularly pronounced in body mass in age classes from 10.5 to 14.5 years. Body height of girls aged 11.5-13.5 years, from families having one or two children, was close to that of their mates from families with 3 or 4 children. A greater number of children in the family were associated with a much shorter stature. However, in age classes corresponding to secondary schools, no systematic differences of that kind were noted for body height or mass.

In earlier studies, differences in body height were strongly related to the number of children and amounted to 1.3-4.0 cm between extreme groups in 1977, and to 0.7 to 3.6 cm in 1987 [ŁASKA-MIERZEJEWSKA, ŁUCZAK 1993].

In all consecutive studies, the age at menarche was also strongly related to the number of children. The difference amounted to 0.53 years between extreme groups in 1977, and increased to 0.71 years in 1987, due to deceleration of menarcheal age of girls from families having 5 or more children by 0.25 years. In 1997 that difference was equal to 0.70 years [ŁASKA-MIERZEJEWSKA 1997]. When compared with the educational or economical status, family size influenced body height and mass of girls to highest extent.

The number of children was related to the educational and economical status of parents. Families having one or two children were more frequent in the non-farmer population and the parents were better educated.

In order to select homogenous groups with regard to 3 variables, a larger starting material is required. Analysis based on such homogenous groups was conducted on data from 13 000 girls from 8 regions of Poland and presented in a monograph. It was concluded that daughters of farmer parents had menarche at a higher age than their mates from non-farmer families with the same number of children and father's education. However, differences between homogenous groups were somewhat smaller compared with the unsorted ones [ŁASKA-MIERZEJEWSKA, ŁUCZAK 1993].

Secular trends

The study extended over two decades, greatly different with regard to the political and social system and to the socio-

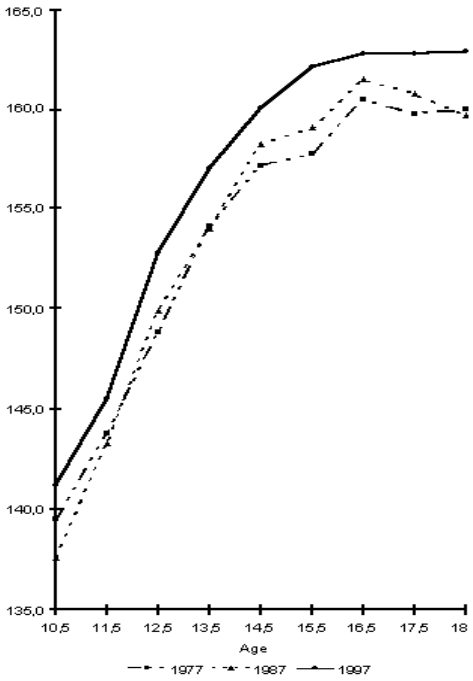

Fig. 9. Height of girls in 1977, 1987, 1997

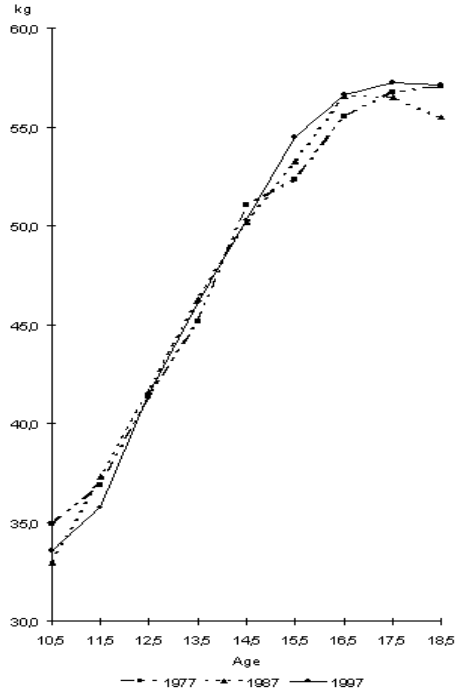

Fig. 10. Body mass of girls in 1977, 1987, 1997

economical status of the population. The economical crisis in the first decade (1977-87) brought about an inhibition of progressing stature. In girls aged 10.5 and 11.5 years, mean body height was in 1987 lower by 1.9 and 0.5 cm, respectively, compared with that recorded in 1977. Only in girls aged over 14.5 years an increase close to 1 cm was noted (Fig. 9).

A similar lack of a positive stature trend during the decade 1978-88 was also observed by HULANICKA *et al*. [1992] in youngest children from urban population (large and small towns) and a slight decrease of that trend by BIELICKI *et al.* [1997] in conscripts.

A significantly increased body height of girls was observed in 1997 as compared with the year 1987, amounting to 1.3-3.6 cm. During that decade the educational profile of girls' parents underwent changes – the percentage of parents with vocational education increased and of those with elementary education – decreased.

A different picture was obtained for changes in body mass (Fig. 10). In 1987, girls aged 10.5 years were by 2.0 kg lighter than in 1977, which was the consequence of a shorter stature (by 1.9 cm). In girls aged 11.5-14.5 years, body mass did not change over that decade while in those aged 15.5-16.5 body mass increased by 1.0 kg. In 1997, a further decrease of body mass of 10.5-11.5-years old girls (by about 1 kg) was noted compared with 1977. In girls aged 12.5-14.5 no change was observed and in those aged 15-17 there was an increase by 1-2 kg, associated with body height increased by 2-5 cm.

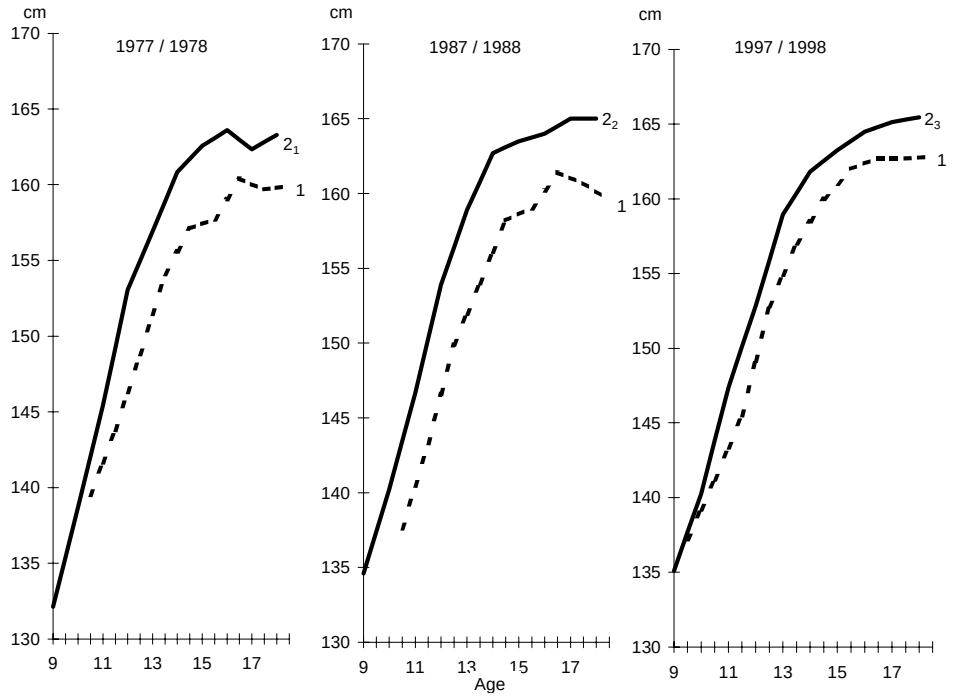

Fig. 11. Height of rural (1) and Warsaw (2) girls in 70s, 80s, and 90s.
2_1 Charzewski 1981, 2_2 Hulanicka *et al.* 1992, 2_3 Palczewska, Niedźwiecka 1999

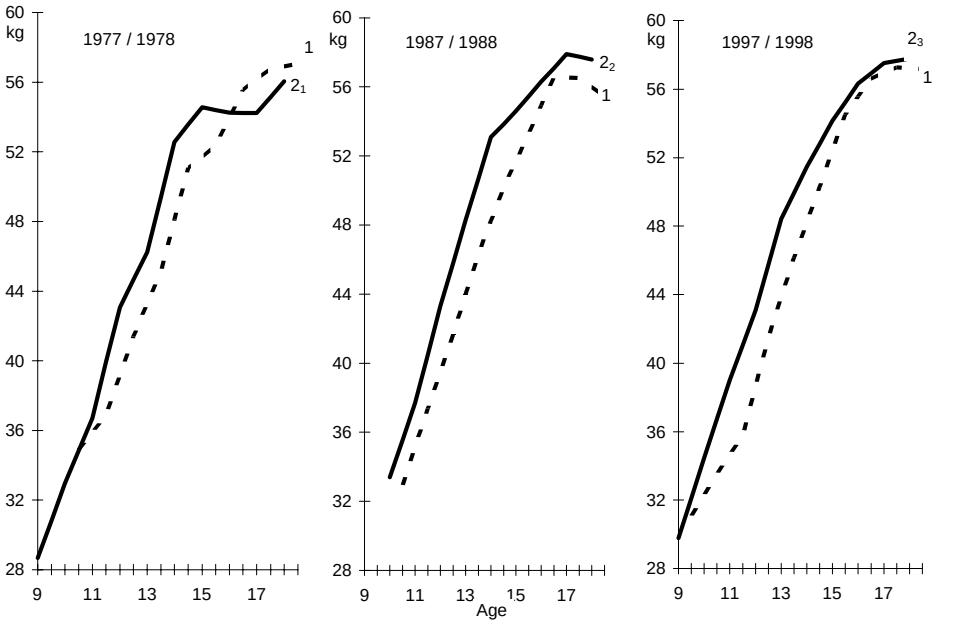

Fig. 12. Body mass of rural (1) and Warsaw (2) girls in 70s, 80s, and 90s.
2_1 Charzewski 1981, 2_2 Hulanicka *et al.* 1992, 2_3 Palczewska, Niedźwiecka 1999

Body mass is known to be sensitive to the living standard. Over the two decades a decrease in weight-height proportions were noted which was another symptom of unfavourable effects of socio-economical conditions on Polish rural population. As presented above, during that period, menarche appeared at a later age in girls from non-farmer families and whose fathers had secondary or higher education. The close relationship between weight-height proportions and the age at menarche had been demonstrated earlier [ŁASKA-MIERZEJEWSKA, ŁUCZAK 1996, 1997].

A decrease in weight-height proportions was also observed by HULANICKA *et al*. [1992] in the years 1978-88 in boys from lower age classes. Since the skinfold thickness did not change over that period, their lean body mass must have decreased.

Urban-rural differences

The disappearance of a positive stature trend and of an accelerated maturation observed in 1988 provoked the question as to whether it could mean a full use of genetic potential, i.e., up to reaching the limits of growth and maturity age. However, marked differences between girls from Warsaw and from rural populations in body height and mass and in the age at menarche, have spoken against that view.

The population of rural girls is distinguished by a much lower body height and mass compared to the population of Warsaw (Figs. 11, 12). Differences in the years 1977 and 1987 ranged in various age classes from 1 to 5 cm and from 1 to 3 kg. In 1997, the difference in body height decreased down to about 2.5 cm due to a well-expressed secular trend in rural girls in the last decade (1987-97). Differences in body mass decreased in consecutive age classes from 5.5 kg at 11.5 years to 0.6 kg at the age of 18, which might reflect a better weight watching of Warsaw girls. Moreover, Warsaw girls were taller not only during the growth period but also at the adult age, i.e. 18 years.

Menarche took place at a later age in rural girls from Krosno region as compared with Warsaw population. The differences in years 1967, 1977, 1987 and 1997 amounted to 0.9, 0.8, 0.7 and 0.6 years, respectively. The data for Warsaw were reported by MILICEROWA & SZCZOTKA [1966], MILICEROWA & PIECHACZEK [1977], ŁASKA-MIERZEJEWSKA *et al*. [1982] and CHARZEWSKI *et al.* [1991, 1998]. According to HULANICKA *et al.* [1992], the difference in the age at menarche between the populations of 3 large towns in Poland and the rural one was equal to 0.6 years in years 1978 and 1988.

Those results show that, at least in the rural population, further increases in body height as well as decreases of the age at menarche can be expected if only the living standard is adequate. No genetic differences are believed to exist between urban and rural populations in Poland, thus the abovementioned differences in biological indices reflect social inequalities which are sufficiently pronounced to affect the stature of children and adults and the rate of adolescence.

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Streszczenie

Wpływ rozwarstwienia społeczno-ekonomicznego populacji wiejskiej na wysokość, masę ciała i wiek menarche dziewcząt 10.5-18.5-letnich pochodzących z tych warstw zostały przeze mnie zarejestrowane w latach 60-tych, 70-tych i 80-tych na podstawie badań prowadzonych w 8 rejonach Polski. Tam gdzie to było możliwe każdorazowo badane były dziewczęta w tych samych szkołach. Głównym kryterium rozwarstwienia było źródło utrzymania rodzin wiejskich; wyłoniono trzy grupy społeczno-zawodowe: rolników, chłopo-robotników i nierolników. Rejestrowano także wykształcenie każdego z rodziców, liczbę dzieci w rodzinie i wyposażenie domu w dobra trwałego użytku [ŁASKA-MIERZEJEWSKA 1971, 1983, ŁASKA-MIERZEJEWSKA, ŁUCZAK 1993].

Na przełomie lat 1997/1998 udało się powtórzyć badania tylko w rejonie Krosna ($N = 1992$). W artykule zostały wykorzystane wyniki badań przeprowadzonych w 1977 roku ($N = 1028$) i w 1987 roku ($N = 1255$). Przytoczone zostały też wyniki łącznego opracowania 8 rejonów.

W 1977 roku dziewczęta z rodzin nierolniczych odznaczały się największą wysokością i masą ciała, a dziewczęta z rodzin rolniczych miały najniższy wzrost i najmniejszą masę ciała. Kryzys ekonomiczny lat osiemdziesiątych w większym stopniu dotknął wiejską ludność nierolniczą, natomiast rolnicy jako główni producenci żywności w Polsce nie byli zależni od racjonowania żywności. Po przemianach ustrojowych i likwidacji państwowych i spółdzielczych gospodarstw rolnych sytuacja bytowa wiejskiej ludności nierolniczej uległa dalszemu pogorszeniu. Znalazło to odbicie w parametrach biologicznych dziewcząt. W 1987 odnotowano znaczne zmniejszenie różnic wysokości i masy ciała pomiędzy grupami rolniczą i nierolniczą, a w 1997 roku dziewczęta grupy nierolniczej miały wysokość ciała równą lub niższą od dwu pozostałych grup populacji wiejskiej. Wysokość i masę ciała dziewcząt w grupach

społeczno-zawodowych ilustrują tabele 4 i 5 oraz rysunki 1-2, a w grupach wykształcenia każdego z rodziców i w grupach dzietności rodzin rysunki 3-8. Tabele 1-3 ilustrują zróżnicowanie wykształcenia rodziców i wyposażenia domu w dobra trwałego użytku w grupach społeczno-zawodowych. Wiek menarche dziewcząt grupy nierolniczej uległ opóźnieniu w dekadzie 1977-1987 o 0.28 roku, a w dekadzie 1987-1997 o 0.08 roku [ŁASKA-MIERZEJEWSKA, ŁUCZAK 1997].

Podczas dekady 1977-1987 (kryzys ekonomiczny) zarejestrowano zahamowanie procesu wysokoroślenia, a w grupach 10.5 i 11.5-letnich dziewcząt odnotowano w 1988 roku obniżenie wysokości ciała (-1.9 i -0.5cm odpowiednio) w porównaniu do badanych 10 lat wcześniej. W 1997 roku zarejestrowano przyrost wysokości ciała dziewcząt od 1.3 do 3.6cm w porównaniu do badanych w 1987 roku (ryc. 9 i 10).

Dziewczęta wiejskie odznaczały się mniejszą wysokością i masą ciała oraz późniejszym wiekiem menarche w porównaniu z mieszkankami stolicy. W latach 1977 i 1987 różnice w grupach wieku wynosiły od 1 do 5cm i od 1 do 3 kg. W 1997 roku różnice wysokości ciała uległy zmniejszeniu do około 2.5cm w wyniku znacznego trendu wysokoroślenia dziewcząt wiejskich w dekadzie 1987-1997. Przewaga wysokości ciała Warszawianek dotyczy nie tylko okresu wzrastania ale także wysokości osiągniętej w 18 roku życia (ryc. 11 i 12). Wiek menarche dziewcząt wiejskich badanych w 1967 i w 1997 roku był późniejszy o 0.9 i 0.6 roku odpowiednio, w porównaniu do dziewcząt warszawskich [MILICEROWA, SZCZOTKA 1966, CHARZEWSKI i wsp. 1998].