

Biological traits throughout society

CITIZENS and Countrysiders



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**A. Szklarska (PhD) has
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Biological parameters of the human body can tell the story of an individual's level of education and place of residence

According to the widely accepted idea of "genetically programmed development," each individual has a theoretically ascribed maximal ceiling for both physical and mental traits. Under favorable conditions, particular traits develop close to their genetically determined limit, whereas more severe stunting leads to the less successful realization of a specimen's potential.

One of the socio-economic factors that differentiate the biological well-being of Poland's population is the degree of urbanization. By this term we mean the size of the population at a particular subject's place of residence. Some anthropological studies show that urban-rural tradeoffs (especially in body height and maturation rate) are a general rule in many industrial societies. Such differences are also clearly marked in Poland. Nineteen-year-old males from larger cities are taller than those from smaller cities, the latter are taller than those from medium-sized towns, who are in turn taller than young male village residents. This phenomenon can be easily explained: large urban centers tend to have much better health-care facilities, more job opportunities, better sanitary standards, easier access to education, etc. Furthermore, studies on rural-urban migrations have shown that the "net" effect of the urbanization factor is so intense that the children of rural-to-urban

"immigrants" were, on average, taller than the children of long-term city residents.

Another essential factor that influences the biological condition of the human population is level of education (which is closely tied to place of residence). Obviously, the cause for this lies neither in the amount of knowledge gained nor in possession of an academic degree *per se*, but rather in the fact that one's level of education is itself determined by one's position within social strata. It is generally acknowledged that better education goes hand in hand with a certain lifestyle, which has a beneficial effect on physical and health status. A rational diet, more physical activity and better hygiene, more prophylactic medical examinations, fewer cigarettes and less strong alcohol use - these are but a few elements of such "education-related behavior."

For many years, scientists at our Institute have been researching the stratification of the Polish population in terms of various indexes of biological "well-being." Here, we discuss the biological aspects of social stratification using education level as a measure of the following features: the growth of young people, the biological fitness of adults, the symptoms experienced by ageing males and premature mortality in males.

Truly higher education

Social gradients (defined by parental education) are particularly clearly manifested by the height-to-age ratio. Despite intergenerational changes in the mean height of the general population, the height-to-age ratio increases in tandem with the level of parental education. The nature of parental education's influence upon children's growth seems to be complex. One might think that education is correlated with earnings, so it may affect growth via income. But a variety of observations suggest that there may be education-associated differences in managing the family budget and in nutritional and hygienic lifestyles that are quite independent of the amount of money available per family member.

This pattern also holds true in the rural regions: 19-year-old men from “upper” social strata are taller than their peers from “lower” strata. Furthermore, rural areas have for certain reasons turned out to be “less friendly” than urban areas, something that is particularly visible when we compare children’s development. These “rural factors” even affect the development of children whose parents hold a university degree. We have been observing this for 15 years, and the large cities continue to be privileged in terms of living conditions.

Our study examined 2800 occupationally active men, aged 25-65, resident in the city of Wrocław. 22 bio-medical characteristics were measured: respiratory, cardiovascular and motor fitness traits, plus several biochemical traits of the blood. Since all these indices of fitness tend to deteriorate with age, each of them, measured in a given individual, can

be taken as an indication of his “biological age”, i.e. his current state of advancement towards the “old-age condition,” relative to his chronological age-mates. For 15 out of the 22 characteristics examined, well-educated males were found to be biologically younger than their poorly educated peers. This superiority of the well-educated proved most marked in respiratory efficiency, blood pressure, pulse rate, spinal flexibility, hearing acuity and eye-hand coordination; it was less pronounced, although statistically significant, in some serological characteristics. Thus, better education helps to slow down the process of aging (probably because it produces generally healthier life-styles).

Aging males

How can age-related changes be assessed in males? The “Aging Males’ Symptoms” (AMS) scale may be the answer. AMS has

Level of parental education is clearly manifested by the height-to-age ratio. Place of residence (city/countryside) influences this parameter as well

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been examined in several countries in North America and Western Europe. So far there are no analogous data from the societies of Eastern Europe. But social differences in the prevalence and the intensity of aging males' symptoms - which constitute an important issue of public health in modern aging societies - have not been established anywhere. We hope that our research will help to fill this gap. We collected data on 351 men aged 40-79, who are healthy inhabitants of the city of Wrocław. The data on the intensity of aging males' symptoms were assessed using the Polish version of the AMS scale (17 symptoms divided into 3 main groups: psychological, sexual and somato-vegetative ones). The social position of the men examined was expressed using their educational level, commonly accepted as a reliable and specific index of social status in Poland.

To young to be old

Male aging in Poland was accompanied by increased intensity of all groups of symptoms evaluated. An at least moderate degree of severity of psychological symptoms (sum-score ≥ 9) was observed in 10.4%, 20.1% and 22.9% of men aged 40-49, 50-59, 60 years and more, respectively. An at least moderate degree of severity of sexual symptoms (sum-score ≥ 8) was observed in 11.8%, 40.3% and 77.1% of men in the same three

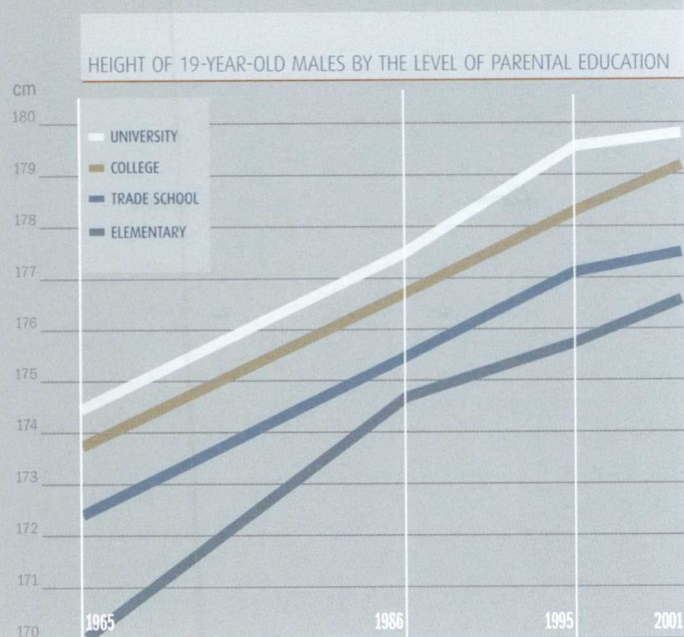
respective age groups. And, an at least moderate degree of severity of somato-vegetative symptoms (sum-score ≥ 13) was observed in 8.3%, 27.6% and 50.6% of men in the same three groups. The better educated Polish men were, the less intense their psychological and somato-vegetative symptoms were. For example, in the group of men aged 50-59, an at least moderate intensity of psychological symptoms was observed in 18.6% of subjects who finished at least secondary school, but in 25.0% of men who finished primary or trade/vocational school at the very most. In the same age group, an at least moderate intensity of somato-vegetative symptoms was observed in 23.5% of men who finished at least secondary school, but in 40.6% of men who finished primary or trade/vocational school at the very most. There were no social gradients in the intensity of sexual symptoms in Polish men. In this study we confirmed the phenomenon of age-related changes in the intensity of aging males' symptoms, and additionally revealed that there was a social stratification in the intensity of several complaints accompanying male aging in Poland.

Unfortunately we do not have data about the pace of aging in Polish rural inhabitants, because of the difficulty involved in carrying out this type of research (e.g. huge examination costs). It would be very interesting to know whether

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the rate of aging is different or the same in both the urban and rural populations.

Premature mortality

Average human lifespan is generally accepted to be one of the most important indices describing the biological condition of a certain population. Particular attention has lately been drawn to so-called premature mortality (the death of people aged 25-65). The death of a person during the period of his or her greatest social, professional and procreative activity has obvious negative consequences for the family of the deceased and on the structure of the general population.

Premature mortality is conditioned by some factors related to the social position of the subject, in particular by educational level. In some countries (the US, Great Britain, Sweden) premature mortality appeared to be lower among subjects with better social status, better education or more prestigious jobs. A similar phenomenon has been observed in Poland. Tadeusz Bielicki and other colleagues from our institute have revealed that in Poland poorer education and unmarried status were two main factors that predisposed individuals to premature death. Moreover, the effect of these factors was much stronger in men than in women.

In 2003, the Institute of Anthropology of the Polish Academy of Sciences launched a new study of premature mortality in Poland. The preliminary results indicate that age-specific mortality rates in males is slowly decreasing, but that regular social gradients of mortality rates still exist. The risk of premature death increases with an individual's decreasing position on the educational scale. The same research offers us a huge opportu-

nity to study premature mortality in rural areas; the results will be in soon.

The influence of social factors on mortality in Poland is by its nature analogous to the interference between social environment and several biological parameters describing the biological condition of individuals. Both phenomena result from 1) inequalities in income; 2) inequalities in working conditions; 3) inequalities in the lifestyles of individuals.

The examples considered above show that education level, in particular, is of significant importance for individuals' biological well-being. This occurred in both urban and rural areas with regard to some traits (body height of youth). In all of the biological indices discussed, persons with a higher education level were characterized by better index "values." On the basis of these findings, we assume that in the future the Polish society will, as a whole, evolve in the direction of the biological values now presented by specimens from the highest social strata. Such a phenomenon has already been observed in highly developed countries like Sweden or Norway. Why? First, the stratum with higher socio-economical status, measured for example by level of education, is increasing its fraction of the general population. The percentage of the parents of military conscripts who had completed university education increased in Poland from 0.5% and 2.1% in 1965 to 12.2% and 11.7% in 2002, for mothers and fathers respectively. Second, many elements of lifestyle and living standards typical for higher social strata penetrate to lower social strata, mainly due to the easy and mass circulation of information and/or more intensive internal social mobility. Both of these processes, in our opinion, are very favorable for the Polish population as a whole. ■

Further reading:

- Bielicki, T., Szklarska A., Kozieł S., Welon Z. (2003) Socio-economical transition in the light of anthropological survey of 19-year-old males. *Monographs of the Institute of Anthropology PAN*, Nr 23.
- Welon Z., Bielicki T., Rogucka E., Malina RB. (1999) Effect of education and marital status on premature mortality among urban adults in Poland, 1988-1989. *American Journal of Human Biology*, 11, 397-403.
- Jankowska EA, Szklarska A, Lopuszanska M, Medras M. (in press) Age and social gradients in the intensity of aging males' symptoms in Poland. *The Ageing Male*.