

LONG-TERM CHANGES IN SOMATIC GROWTH AND NUTRITIONAL STATUS AMONG CHILDREN AND ADOLESCENTS FROM EASTERN POLAND (1986–2021)

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Background: Long-term changes in children and adolescents' somatic development are sensitive indicators of population health and socioeconomic conditions. In recent decades, the double burden of malnutrition, including both excessive and insufficient body mass, has become increasingly evident.

Objective: This study aimed to assess secular changes in body height, body mass, BMI, and nutritional status among children and adolescents from Eastern Poland between 1986 and 2021, with consideration of sex differences.

Subjects and methods: The study included 27,997 individuals (13,172 boys and 14,825 girls) aged 8, 13 and 17 years, examined at five time points (1986, 1996, 2006, 2016 and 2021). Anthropometric measurements were performed using standardized procedures. BMI was calculated as body mass (kg) divided by height squared (m²), and nutritional status was classified using international cut-off points. Temporal changes were analyzed using Welch's ANOVA with Games–Howell post hoc tests, and effect sizes were estimated using Hedges' g. Differences in BMI categories were assessed using the chi-square test.

Results: A clear secular trend was observed. The greatest increases in height and body mass occurred in 13-year-olds (boys: +10.62 cm and +12.54 kg; girls: +7.40 cm and +8.42 kg). Overweight and obesity prevalence increased across all age groups, particularly among younger children (up to +19.89% in girls and +21.70% in boys). Underweight decreased in younger groups but increased among older girls. These changes were most pronounced in 2016–2021.

Conclusions: The findings confirm the presence of clear secular trends in the somatic development of children and adolescents from Eastern Poland. The observed changes are consistent with long-term population-level influences that may have affected growth and development over time. Variation in the direction and magnitude of these changes across age and sex groups highlights the complexity of developmental processes in the studied population.

Keywords: Secular trends; Somatic development; BMI; Children and adolescents; Nutritional status.