

HEIGHT AND HEALTH CONDITIONS OF THE MALE POPULATION OF UMBRIA REGION (ITALY) DURING THE LAST CENTURY

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BACKGROUND AND AIMS

Traditionally, most of the demographic debate concerning the relationship between height and health has relied on evidence of their significant correlation. Though these studies shed light on the causality relationship, the main use of time series did not allow to disentangle within the variability of other factors that could be linked with health. Indeed, it is known that differences in height depend on the heterogeneous level of education or work status (Livi, 1905, Komlos, 1993; Cavelaars, 2000) as well as on diet habit, disease, household conditions or sanitary infrastructure (Rona 1981; Nystrom Peck, Lundberg, 1995). Moreover, studies that attempt to investigate Italian historical patterns of height, taking into account the demographic transition, show close relationship with the factors explaining the health. Thus, endogeneity issues might arise from simultaneous empirical estimations.

This paper revised the secular trend between health and height by using four cohorts of military conscripts of the Umbria region (Italy) during the last century. The use of individual data enables to empirically document: (i) the variability of the anthropometric characteristics correlated with the improvements on the standard of living; (ii) health changes, by evaluating the causes of discharge for unfitness from the army. Indeed, the richness of the

individual information allows to investigate the factor constraints within each cohort and to follow the time pattern of the studied variables.

DATA

Military recruitment records are used as the main data source for the empirical analysis in which health and personal physical information are reported for the generations of male of the 1881 and 1911. In particular: i) the socio-economic and sanitary conditions arises from the army medical records are considered to re-construct the evolution of health profile of young males by using the multi-causes of unfitness from military service and to analyse the different type of morbidity and the persistence of pathologies; ii) the anthropometric parameters are included to estimate the male stature related to the changes in the behaviour and habits.

By extracting the same data information from a recent databank built by an Italian research project for the cohorts of the 1951 and 1980, we could obtain a long view of the evolution of height and health relationship.

Methodologically, as a first step, we implement an auxiliary nonparametric regression between the probability to be fitness for army and height to evaluate if the last variable is a good proxy for health. Under this assumption empirically testable, we estimate the impact of socio-economic characteristics on height for the cohorts of conscripts by using a Tobit model. In fact, for the older generations, namely those of 1881 and 1911, the law exclusion threshold generated a relevant number of censored cases and the use of a consistent estimator is necessary to avoid biases in the estimations.

RESULTS

The results show that height is a good proxy of health conditions and suggest a significant relationship between height and various socio-economic indicators. In fact, nonparametric estimations confirm the positive and significant link

between the height and the probability to be fit for army. It is worth noting that this relationship assumes a non linear form in each cohort with a maximum that ranges from 162 cm to 166 cm. Moreover, we find a negative relationship between education level and to be declared unfit for military service. Statistical results highlight a decrease of its negative impact caused by the sharp rise of the conscripts with medium-high level of education in the generations born after the World War II.

Thus, health and socio-economic changes support the improvement process of living conditions in the first decades of 1900 and, by the conscripts of the Umbria region, confirms the findings of the Italian secular trend in stature (Arcaleni, 2006). We find, on average, that between the cohorts of the 1881 and those of 1980 the height increased from 163.4 cm to 173.2 cm. Moreover, the comparative analysis of the cohorts shows a transition from a dynamic with high percentages of conscripts declared unfit for the military service because of general weakness, to a situation in which chronic diseases, linked with behavioural and environmental modifications, were the main causes of discharge for unfitness.

REFERENCES

- E. Arcaleni 2006, Secular trend and regional differences in the stature of Italians, 1854–1980, *Economics & Human Biology*, Volume 4, Issue 1, 24-38.
- A.E.J.M. Cavelaars, A.E. Kunst, J.J.M. Geurts, R. Crialesi, L. Grötvedt, U.Helmert, E.Lahelma, O. Lundberg, A. Mielck, N.Kr. Rasmussen, E. Regidor, Th. Spuhler and J.P. Mackenbach 2000, *Persistent variations in average height between countries and between socio-economic groups: an overview of 10 European countries*, «*Annals of Human Biology*», 27, 4, 407-421.
- J. Komlos 1993, *The secular trend in the biological standard of living in the United Kingdom, 1730-1860*, «*Economic History Review*», XLVI:1, 115-144.
- R. Livi 1905, *Antropometria militare. Parte II: Dati demografici e biologici*, «*Giornale medico del Regio Esercito*», Roma.
- M. Nyström Peck, O. Lundberg 1995, *Short stature as an effect of economic and social conditions in childhood*, «*Social Science and Medicine*», 41, 733-738.
- J.R. Rona 1981, *Genetic and environmental factors in the control of growth in childhood*, «*British Medical Bulletin*», 37, 265-272.