The use of the height census of schoolchildren in Central America and Panama

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Abstract

Height censuses—involving the measurement of all children attending first grade—have been used in Central America to detect growth retardation, to screen high-risk groups, and to target social interventions. Data on age, sex, residence, and socio-economic characteristics are obtained from the teachers. Studies carried out by INCAP have confirmed the simplicity and low cost of analyses of height-census data as well as their reliability and validity. In the Central American region, data on height retardation reflect the variation found among countries when other socio-economic and biological indicators such as illiteracy, infant and child mortality, and social services are considered.

Introduction

The growth of pre-school children is commonly used as an indirect indicator of their nutrition status. In addition, since growth in underprivileged populations is mainly determined by environmental factors such as food intake and illnesses, growth retardation could be used as an indicator of inadequate quality of life [1]. For this reason, the height retardation of children who enter the first grade of elementary school has been proposed as a useful indicator to identify high-risk population groups with poor health, undernutrition, and low socio-economic status.

This paper discusses the results when an entire region, the Central American isthmus, used height censuses to detect growth retardation, to screen high-risk groups, and to target social interventions. This methodology has also been used to evaluate the impact of the last. Thus, the height census may be recommended for three of the four purposes identified for food and nutrition surveillance systems: planning, evaluation, and advocacy [2].

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Materials and methods

The height census consists of measuring all children who attend first grade of primary school. In addition, information on age, sex, residence, and, in some cases, socio-economic characteristics are obtained by the first-grade teachers. The teachers are trained in a standardized method of obtaining data, using simplified guidelines describing the measurement techniques. They also are provided with cardboard measuring charts and a drawing triangle. A more detailed description of the methodology is presented elsewhere [3]. The quality of height information collected by teachers has been shown by INCAP to be highly reliable [4].

Data processing and flow of information have used two approaches: In some countries all the information collected is sent to the central level for recording and analysis. Elsewhere, the teachers summarize the information so that the central level receives a summary from each school describing the magnitude of height retardation by age group and sex. The latter approach simplifies processing at the central level, thus reducing logistic and other costs; however, information that could be used for other analyses at the individual level is lost. INCAP has participated in the quality control in both methods, demonstrating that the information processed and summarized at the field level is as reliable as that processed at the central level.

The final analysis and interpretation of the information generally are the responsibility of the nutrition departments of the ministries of health and education or of specialized data-processing centres. The primary analysis includes descriptive statistics, such as calculations of mean height and proportions of children with height retardation by age group, sex, and place of residence. In the calculation of height retardation, the

height of a child at a given age is compared with the median height for children of the same age in the WHO reference population, derived from the NCHS reference height-for-age standard, and the corresponding Z-score value is calculated. Height retardation in a child has been defined as being shorter than 2 SD below the median height of the reference population. The expected proportion of children in that category in a well-nourished population is 2.5% [5].

Results of the analyses have been disseminated through reports for each country presented at regional technical meetings [6; 7]. These present descriptive information that allows the identification of high-risk geographic areas, based on the aggregate of schools with high proportions of height retardation.

Results

Table 1 presents information on the countries' demographic characteristics as well as on the height censuses. As can be seen, there is considerable variation in the countries' illiteracy rates: Costa Rica has the lowest rate, and Guatemala the highest. All the countries of the region have carried out one or more censuses during the last decade. Costa Rica began this activity in 1979 and completed its fifth census in August 1989. The table also shows that there is considerable heterogeneity in the magnitude of height retardation among the countries; it is greatest in Honduras and Guatemala and lowest in Costa Rica. Secular changes can be identified in the countries with more than one census, Costa Rica and Panama. In Costa Rica, height retardation decreased by 45% from 1979 to 1985, whereas in Panama there was a decrease of approximately 22% from 1982 to 1985, followed by an increase for the period 1985–1988. Figure 1 shows the mean heights for Costa Rica, Panama, Honduras, and Guatemala, as well as that of the reference population.

Besides showing the differences between countries, the data collected in the height censuses allow the identification of geographic areas within each country where height retardation is the greatest. Figure 2 identifies the areas in the highest quartile of height retardation for each country in the Central American

TABLE 1. Height census data from Central America and Panama

	Year	Illiteracy rate (1980)	No. of primary schools	No. of children	Height retardation (%)
Guatemale	1986	45.6	7.065	205.959	49.0
Salvador	1988	42.9	4.000	142.945	29.8
Honduras	1986	32.2	5.875	170.299	39.4
Nicaragua	1986	12.1	5.251	100.265	22.0
Costa Rica	1979	10.2	3.000	52.126	20.4
	1981	—	—	55.584	15.6
	1983	—	—	59.508	12.7
	1985	—	—	64.455	11.3
Panama	1982	11.9	2.301	66.161	23.1
	1985	—	2.602	67.203	18.8
	1988	—	2.600	60.801	24.4

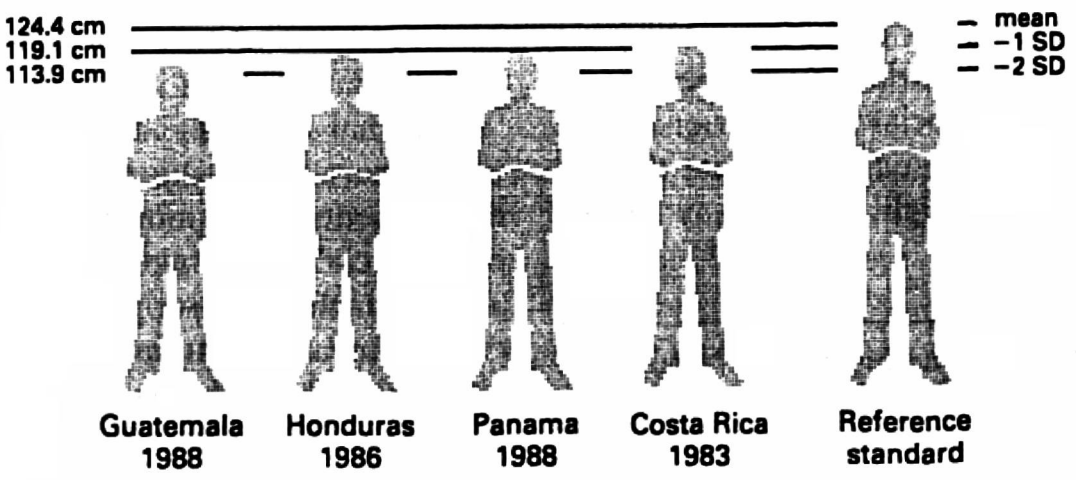

FIG. 1. Mean heights of first-grade schoolchildren in four countries compared to the World Health Organization reference standard

FIG. 2. Geographic distribution of height retardation in first-grade schoolchildren in Central America and Panama. The darkest shaded areas represent the zones with the greatest retardation.

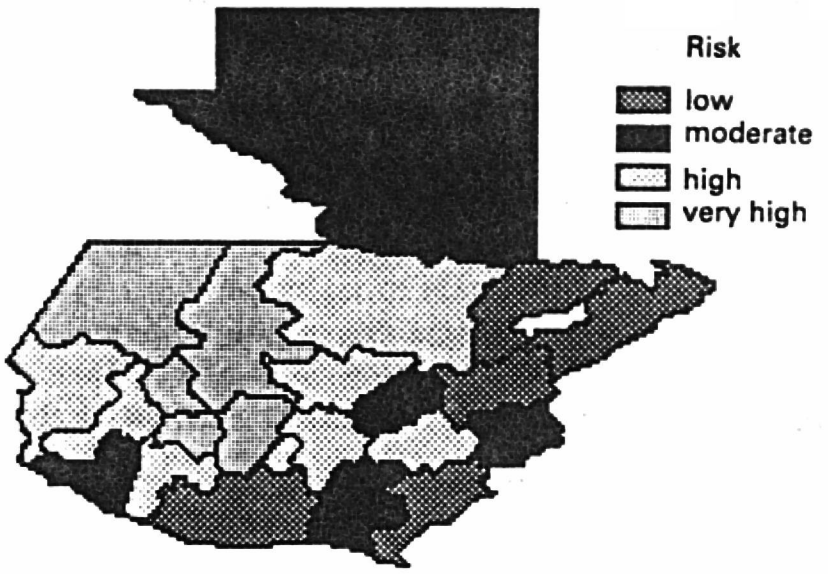

FIG. 3. Height retardation in first-grade schoolchildren in Guatemala, by departments (1986). Low risk = 24.1%–25.9% retardation; moderate = 26.0%–35.9%; high = 36.0%–50.9%; very high = 51.0%–64.6%

isthmus. The information shown for Guatemala in figure 3 provides a good example of the data aggregated at the departmental level. In addition, census data are useful for identifying smaller geographic areas such as counties and districts within departments and provinces. This helps to detect variation between geographic areas where the average proportion of retardation is extreme.

Discussion

The data on height retardation reflect the variation found between the countries in other socio-economic and biological indicators, such as illiteracy, infant and child mortality, and social-services coverage. Furthermore, the high-risk geographic areas identified within countries coincide with those identified by other indicators that are more complex and expensive to collect, such as specific surveys and population censuses.

The changes that have occurred in the prevalence of height retardation in Costa Rica are a valid indicator of improvements in quality of life and development in that country. On the other hand, the recent increase in the proportion of children with height retardation in Panama could be a reflection of the present socio-political crisis and the internal rural-to-urban migration of the population that has been taking place in recent years.

Because of the simplicity and low cost of the collection and analysis of data from height censuses of first-grade schoolchildren and their reliability and validity, as confirmed by the studies carried out by INCAP, it is recommended that the use of such censuses for planning activities, monitoring and evaluating interventions, and advocacy be extended to other countries and regions.

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