An integrative approach to health transition: trends in mortality and nutritional status in Spain during the 20th Century

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Extended abstract

Introduction

Health transition refers to a wide range of components at three main dynamic levels: health care transition, epidemiologic transition and risk transition (Robles et al., 1996). Likewise, this complex concept usually coincides with two interrelated historical processes which involve social and behavioral related factors (Lerner, 1973; Caldwell, 1990; Frenk et al., 1991). On the one hand, referring to the political and institutional context, there was the development and subsequent consolidation of different types of public health and welfare services. On the other hand, in terms of demographic trends, in most countries first mortality declined and later fertility, that provoked a relatively high natural population growth until both rates began to converge (the so-called demographic transition). In Spain, both of these aforementioned processes happened within specific circumstances and a later time frame than most other Western European countries.

With regard to the two demographic components, one characteristic of the early health transition was the sharp decrease of infectious diseases that caused large declines in particularly infant and child mortality (Schofield et al., 1991). The other relevant and partly associated demographic change was the decline in fertility which occurred later and over a shorter period of time. While in most other Western European countries the bulk of these changes were already in progress between the mid 18th and mid 19th century in the case of mortality and in the late 19th and early 20th century in the case of fertility (Livi-Bacci 1992; Gillis et al., 1992), in Spain mortality did not start to decline until late 19th century and fertility around the second decade of the 20th century (Gómez Redondo, 1992; Sanz Gimeno and Ramiro Fariñas, 2002; Nicolau, 2005).

Secondly, in Spain, democracy and a modern welfare state that guarantees social and civil rights to everyone and the provision of benefits and services to those in need, did not emerge until several years after the death of Franco in 1975. This meant a delay of about four decades with respect to most other Western European countries. There is also evidence of irregular food supply and caloric deficits in Spain until the mid 1950s and that the advanced stage of the nutritional transition, which includes the diversification and enrichment of daily diet, is more recent than in neighboring countries (Cussó, 2005).

We therefore consider that as Spain underwent many and rapid political, social and economic changes throughout the 20th century, its health transition should be explored by taking into consideration specific historical time periods evaluating the influence of different factors and emphasizing gender and cohort differences as a way to supplement recent research on past wellbeing in the country (e.g. Martínez Carrión, 2002).

Study objective

The approach to health in historical demography is usually oriented towards quantitative indicators like life expectancy or mortality rates and less to the *quality* of living conditions. We argue, however, that indicators derived from vital statistics should be used in conjunction with other health data such as from medical and military recruitment records and health surveys. For instance, a number of anthropometric indicators are being used in bioeconomic and demographic studies in order to assess

trends in health and nutritional status in the past (Fogel, 1986; Komlos, 1994). The purpose of our study is therefore to analyze both traditional (mortality-based) and alternative (anthropometric-based) health indicators in the hope that this combined approach will render new insights in the way that the health transition took place in Spain throughout the 20th century.

Firstly, a general background on the epidemiologic transition in Spain is presented by analysing the changes in total and cause-specific mortality patterns for different age groups.

Secondly, attention will be devoted to the trends in infant mortality and height across 10-year cohorts during the course of the 20th century. The analysis of infant mortality will be used as an indicator of childhood environmental conditions and public health care provisions (REFS) whereas the trends in stature will specifically provide information on childhood and adolescence nutritional status (REFS). Height is considered a useful indicator because it approximates the degree to which environmental (e.g. nutrition and illness) and socioeconomic conditions contribute to the attainment of a maximum biological potential growth that is genetically determined (REFS). The availability of cohort data on adult height would therefore permit a combined approximation of such conditions during the two critical periods of physical growth: infancy and adolescence.

Finally, the well-known steep rise in period life expectancy in Spain during the last half a century will also be analysed alongside the mortality- and anthropometric indicators in order to refine the timing and interpretation of the health transition within the country.

Data and some methodological issues

Here we briefly summarize the data sources that have been used, as well as several methodological issues. Both will be mentioned in more detail in the paper, although they have already been discussed elsewhere (Pérez et al., 2005; Spijker et al., 2008).

Height data (self-reported) were obtained from the seven Spanish National Health Surveys (SNHS) that were held between 1987-2006. Athough the SNHS is not a panel survey, given the high congruence in its content (Spijker et al., 2008), the different surveys were aggregated into one database. Notwithstanding, some small sample biases did have to be dealt with. As the elderly and the less populated regions were oversampled during certain waves, samples were weighted with official population data from the National Statistics Institute (INE). Data were also screened for errors and omissions with respect to the variables age, sex, residence region and height. We further increased the sample reliability and its comparability across time and quasi birth-cohorts by calculating 10-year birth cohorts and aggregating single ages into 10-year age groups, whereby age-cohort combinations with fewer than 500 respondents were also discarded. This gave a final sample size of almost 100,000 and provides an excellent opportunity to analyze both changes in health and health-related behavior over time as well as within and between quasi-birth cohorts. More precisely, we have at our disposal a continuous height series for both male and female cohorts that were born since the beginning of the 20th century. This therefore includes those who have experienced a large part of the Spanish health transition.

Spanish vital statistics and census is the source for the cohort mortality indicators that will be analysed, that includes cause-specific death patterns (also of infant mortality). Additional infant mortality data by 10-year birth cohort (1910-19 to 1980-89) have been obtained from the Human Mortality Database (http://www.mortality.org/) (see Table 1).

Some preliminary results

From the infant mortality data, a continuous convergence process between sexes can be observed, thus reducing the biologically-determined higher mortality rate among boys throughout the 20th century. Nevertheless, this convergence shows some interesting time-related components that will be studied in more detail in the paper. Note for instance, that the most significant reduction of infant mortality among boys when adjusted for the girls' trend occurred between 1940 and 1959 (Table 1, last column), matching a period when successive female cohorts did not show any significant improvement in height (Table 2 and Figure 1). This period identifies potential nutritional deficits for females in comparison to males and roughly coincides with the first stage of Franco´s dictatorship that was characterized by economic autarchy and increasing social differences with specific disadvantages for the lower social classes in general and for those who lost the Spanish Civil War in particular. We also know about the ultra-catholic and patriarchal nature of the Franco regime but additional

information would be needed to determine whether this also translated into a temporal disadvantage for females during the course of the health transition. We think that the period shortly after the Spanish Civil War, coinciding with a stagnation of the female nutritional status as reflected by the cohort height series, should be studied more deeply, particularly into the relation between gender roles and living conditions. Also worth mentioning is the progress in height that was made by males during these difficult decades, an aspect that will also be discussed in the paper.

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Table 1. Differences between male and female infant mortality (rates * 1000)

Birth cohort	Male	Female	M-F	M-F interperiod
1910-19	187,5	163,0	24,5	
1920-29	164,8	144,8	20,0	-4,5
1930-39	144,6	122,5	22,1	2,0
1940-49	116,1	99,4	16,7	-5,3
1950-59	66,0	54,4	11,7	-5,1
1960-69	44,3	34,7	9,6	-2,1
1970-79	22,7	17,8	4,9	-4,7
1980-89	11,1	8,8	2,3	-2,6

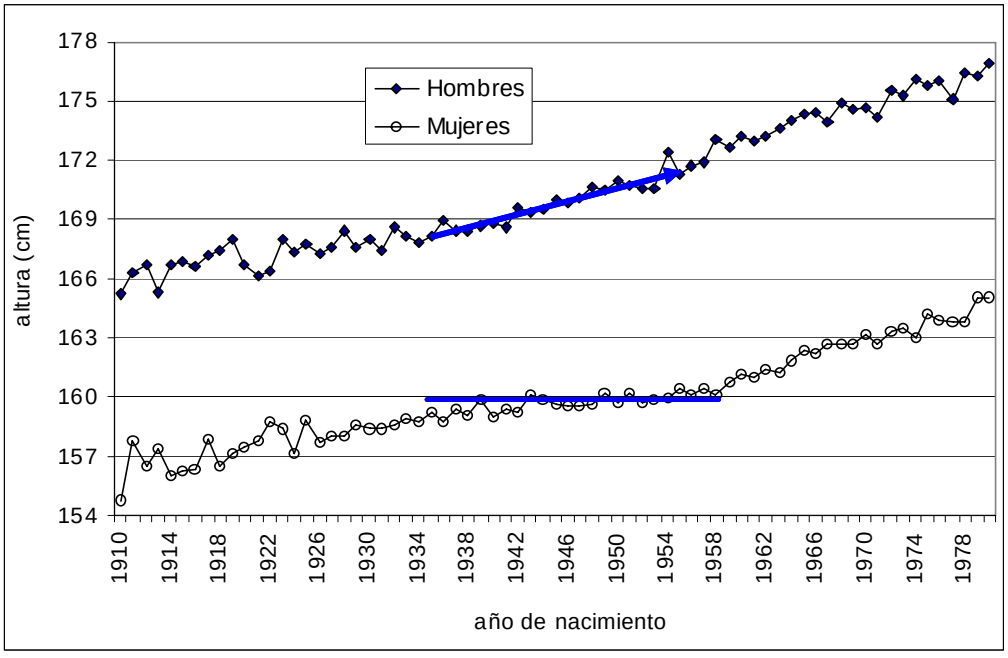
Source http://www.mortality.org/ (own calculations)

Table 2. Differences height between males and females aged 20+ in cm.

Birth cohort	Men	Women	M-F	M-F interperiod
1910-19	166,8	156,7	10,1	
1920-29	167,4	158,2	9,3	-0,8
1930-39	168,2	158,8	9,4	0,2
1940-49	169,6	159,6	10,1	0,6
1950-59	171,6	160,1	11,5	1,4
1960-69	174,0	161,8	12,1	0,6
1970-79	175,7	163,6	12,1	0,0
1980-89	177,3	164,5	12,8	0,7

Source: National health surveys 1987-2003, own calculations (see also Pérez et al 2005).

Figure 2. Gender cohorts by mean height*. Spain, 1910 – 1980



*The self-reported heights have been compared with clinical studies and anthropometric data from the recruitment records when they were available at the national level (see Spijker et al., 2008). Resulting bias is within tolerant margins and not enough to refute the results (about biases in self-reported data, see more in Rowland, 1990 and Nawaz et al., 2001).