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Vulnerable Child: The Doctor Alexandre Frías i Roig (Reus, 1878-1963)

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Abstract: *Demographic and Epidemiological Transition, conceptual framework of our research, we propose what happened in Reus (Spain) between 1900 and 1935 (before the Civil War). The province of Tarragona holds the highest life expectancy of all the Spanish provinces, which increased year per year as the century progressed. The evolution of general mortality, infant mortality, and causes of death in the province of Tarragona are analyzed in comparison with Catalonia and Spain. The data used was derived from statistics on deaths classified according to cause of death from the Instituto Nacional de Estadística and the Institut d'Estadistica de Catalunya. This epidemiological study has been performed by grouping major causes of death; and the methodology used is that of indirect standardization. The results show: that between 1900 and 1935, life expectancy increased about 20 years; and that women's life expectancy grew more than that of men. Life expectancy improvement for Tarragona is due to the lower incidence of diseases caused by infectious diseases, promoting quality of life through the pioneering efforts of hygienists (mainly between 1910-1920 of Reus), education, high levels of parental literacy, good diet in nutrients, and good weather.*

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I. Introduction And Theoretical Focus

From the Demographic and Epidemiological Transition, conceptual framework of our research, we propose what happened in Reus (Mediterranean town of Spain) between 1900 and 1935 (before the Civil War). Early in the XX century, Reus held the highest life expectancy of all the Spanish cities, which increased year per year as the century progressed. The decline in child mortality was very fast.

The association between consumption of dairy products and the risk of developing infectious illnesses is unclear. The purpose of this study was to evaluate the associations between different causes (education, higiènic-cultural, nutrition and climate) and high disease infections in a Mediterranean population.

Spatial inequalities in human development are of great concern to international organisations and governments. The infant mortality rate is an important measure for determining these inequalities (Bideau, et ali, 1994). Using demographic and epidemiological indicators over long time periods at relatively high levels of geographical detail, we can describe the changes in spatial inequalities (Klüsener, et ali, 2014).

To look for causes for this we have studied at micro level. We propose what happened in Reus (Mediterranean town of Spain) between 1900 and 1935 (before the Civil War). Early in the XX century, Reus held the highest life expectancy of all the Spanish cities, which increased year per year as the century progressed.

Doctor Alexandre Frias Roig (Gonzalvo-Cirac, 2015), orphaned at age 12, worked while studying to keep younger brothers and sisters. In Barcelona, he studied Medicine and graduated in 1902. He began his career in Ametlla de Mar but then moved to Reus and worked as a Pediatricians. In this period (1900-1935) Reus was the first town the Catalonian after Barcelona.

Very concerned about the high rate of infant mortality in the country, he promoted an intense publicity campaign of early childcare for mothers who have just had a child and freely distributed a leaflet entitled Civil Registry Tips for mothers to raise well their children. In 1913, after a study tour to different European countries, he was appointed doctor of the board of trustees of medical department Reus, an institution created to protect children in Reus. In 1917, with the help of patron Evarist Fabregas, Alexander Frias founded the Association of Charity in Reus to help pregnant women. Two years later, in 1919, he created the Institute of Childcare Reus

known as "La Gota de Leche" in order to help children protecting them from poverty and ignorance based on the control of pregnant women and educating children. The Institute organized and collaborated with school camps and Municipal Service Inspection Medical School. The work of Alexander Frias helped determine an extraordinary reduction in the infant mortality rate in Reus compared to the rest of Spain. Frias was the first to study a disease common in the area, still not correctly diagnosed as leishmaniasis.

In 1921, he created and was editor of the Childcare Magazine published until 1936. The same year, he founded the Municipal Laboratory and in 1924, implemented inspection of Medical School and Physical Education in school. Moreover, Frias promoted the creation of a Department of Pediatrics at the Hospital Sant Joan de Reus which, in 1945, was appointed director.

Alexander Frias, besides giving his name to the Institute of Childcare Reus of which was founder and director, was distinguished, among others, the Civil Order of Health (1950) and Gold Medal Reus (1958).

Higher consumption of maternal milk, the higiènic education, the climate and the sun, and the sport was associated with a reduced risk of infection disease from a Mediterranean population. This can help countries with high infant mortality from infectious diseases when the medication is not available.

II. Data And Research Methods

The evolution of general mortality, infant mortality, and causes of death in Reus are analyzed in comparison with Catalonia and Spain. The data used was derived from statistics on deaths classified according to cause of death from the (INE) *Instituto Nacional de Estadística* and the (IDESCAT) *Institut d'Estadistica de Catalunya*. Mortality rate tables by sex and age. The epidemiological study has been performed by grouping major causes of death (where infectious diseases occupy the highest specific occurence) and the methodology used is that of indirect standardization.

The International Classification of Diseases (ICD) has been used to study causes of death since 1900. The method used to create a continuous series of causes of death is the following:

A) Classification Causes of death between 1900-1940 (Perrenoud,1991). The Fourth revision of ICD of the causes is used for the creation of the continuous series, like G. Casselli (1992).

B) The diseases "indefined causes" are distributed according to the method set forth by the method J. Vallin (1987; 2010).

C) The group "other diseases" is also included during the time period from 1990-2010 due to its great importance at this time.

D) The method used is the mortality rate indirect standardization with regards to Spain. Then, we calculate the Standardized Mortality Ratio (SMR), rate of actual deaths and expected deaths in Spain (Goldberg, 1994; Llorca, 2000; Schoenbach, 2000; Menacho, 2002 y Nordness, 2007)

Calculate number of expected deaths in study population

Σ (Standard age-specific death rate) x (Study age-specific pop weight) = # Expected Deaths

$$\textbf{Standardized Mortality Ratio} = \frac{\text{Number of Observed Deaths}}{\text{Number of Expected Deaths}} \times 100$$

If SMR < 1, the mortality is less than Spain and if SMR > 1, the mortality is greater than Spain.

Expected findings: Theresults show:
1)Between 1900 and 1935, life expectancy increased about 20 years; and that women's life expectancy grew more than that of men.

2)SMR by large mortality causes, 1900-1940

	1900		1920		1930		1940	
	Men	Women	Men	Women	Men	Women	Men	Women
INFECTIOUS DISEASES								
epidemic	1,96	1,98	0,64	0,65	0,89	0,85	0,87	0,81
tuberculosis	1,05	0,87	0,69	0,68	0,72	0,69	0,71	0,69
meningitis	0,86	0,90	0,48	0,53	0,57	0,34	0,83	0,89
CANCER	0,69	0,68	0,88	0,94	1,61	1,24	1,26	1,33
CIRCULATORY DISEASES	1,01	1,04	1,13	1,38	1,44	1,25	1,06	1,15
congestion-hemorragia	1,52	1,67	1,51	1,56	1,56	1,68	1,69	1,51
RESPIRATORY DISEASES	1,03	1,15	0,74	0,95	0,89	0,73	0,77	0,71
DIGESTIVE DISEASES	0,59	0,58	0,23	0,25	0,23	0,20	0,40	0,31
diarreas-enteritis	0,87	0,90	0,37	0,40	0,38	0,28	0,33	0,36
PUERPERAL DISEASES		0,78		0,87		0,98		0,69
CONGENITAL DISEASES	0,56	0,55	0,42	0,42	0,56	0,42	0,32	0,32
EXTERNAL CAUSES	1,21	1,95	1,20	1,26	1,16	2,19	0,61	0,55
suicidios	0,89	0,79	1,25	1,34	0,95	1,20	2,22	1,43
OTHER DISEASES	2,27	2,24	0,58	0,38	0,51	0,35	1,67	2,03
INDEFINED CAUSES	1,63	1,46	0,55	0,43	0,92	0,73	0,46	0,41
TOTAL	0,93	0,95	0,60	0,60	0,97	0,72	0,77	0,63

3)We evaluated the associations between different causes (education, higiènic-cultural, nutrition and climate) and high disease infections in a Reus and Spain. Reus won in education, level higiènic-cultural, better nutrition and good climate (sun).

III. Discussion And Conclusion

The large volume of studies on infant and child mortality testifies to the enduring appeal of the subject within historical demography. The paper focuses on two main aspects that have been central to demographic research and still require further attention: the first one relates to the problems of measurement, classification and definition, while the second one refers to the vast theme of the determinants of survival in the first years of life during the health transition process. Research activity has made significant progress in relation to some of these determinants, while for others the results require stronger multidisciplinary collaborations. However in recent years the research agenda has greatly expanded as the result of a fruitful interdisciplinary exchange and an open dialogue between the various disciplines, which should be further enhanced.

1) Our results of data confirmed the research of Klüsener and we have solved the problems of underreporting (especially of girls) and other problems of data quality. But we disagree with ("in eastern and southern Europe, we find significant variation within and across countries, which might stem in part from data quality problems". (Klüsener, et ali, 2014).
2) Life expectancy improvement for Reus is due to the lower incidence of illnesses caused by infectious diseases, promoting quality of life through the pioneering efforts of hygienists (mainly between 1910-1920), education, high levels of parental literacy, good diet in nutrients, and good climate.
3) The association between consumption of dairy products and the risk of developing infectious illnesses is unclear. We evaluated the associations between different causes (education, higiènic-cultural, nutrition and climate) and high disease infections in a Mediterranean population (Pozzi, et ali, 2015).
4) The differences by level of education is very important. Reus was high level cultural and of education (Gonzalvo-Cirac, 2015).

The period between 1900 and 1940 is particularly interesting due to the social and economic changes that Reus, Catalonia and Spain as a whole underwent during that period. Mortality trend divergences and convergences between different areas show that there would clearly be two distinct periods and that a specific element, medical and pharmacological progress, would differentiate them both. Due to the new medicines used, environmental factors lost the relevance they had before 1940.

In conclusion, results seem to show that before 1940 Reus had relatively good life expectancy and lower SMR than the chosen standard (Spain) due to the lower incidence in it of certain environmental factors mainly causing infectious, digestive and respiratory disease deaths. Such factors had a higher incidence in other Spanish provinces, particularly Meseta ones, where epidemiological patterns would not have changed until much later than in Reus. Meseta provinces would have to wait until antibiotics and other medical and sanitary organisation improvements were diffused. Between 1900 and 1960, and particularly from 1940, mortality differences between Spain and central and northern Europe, and among central and coastal provinces within

Spain, were drastically reduced by these medical advancements (Leasure, 1962; Breschi, Pozzi and Rettaroli, 1996; Cussó and Nicolau, 2000). As a result of Spanish rapid mortality decline, its life expectancy reached Reus's figures in 1940. In fact, at this date Tarragona SMR were even higher than those of Spain.

In Reus, in 1917, the Doctor Alexander Frias i Roig founded the Association of Charity in Reus to help pregnant women. Two years later, he created the Institute of Childcare known as "La Gota de Leche" in order to help children protecting them from poverty and ignorance based on the control of pregnant women, parents and educating children. The Institute also organized sport in school and a Municipal Service Inspection Medical School (Gonzalvo-Cirac, 2015).

The work of Alexander Frias helped determine an extraordinary reduction in the infant mortality rate in Reus (before the existence antibiotics!!) which then extended to other areas of the peninsula (not forgetting that Reus was one of the cities that had more inhabitants in the early twentieth century in Spain).

We would present the importance of a dialogue between past and present. The recent studies on the determinants affecting survival in the first years of life have indeed offered an important contribution for a deeper understanding of the causes of the historical decline in infant and child mortality. However it is also clear that the historical experience in the fight against mortality in the first years of life could help provide valuable insights into today's health interventions in the poorest countries.

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