URBAN ELDERLY MORTALITY IN BRAZIL: LINKS AND SOCIOECONOMIC CONSEQUENCES.

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Context

Becoming old is also a very likely destiny for populations in Latin America particularly for urban areas. In Brazil more than 80% of the population is urban and the proportion of elderly persons has increased rapidly at least since the 80's, when Brazilian epidemiological and demographic transition started having its strongest impact. But, the knowledge of the elderly mortality by causes of death in Brazil is restricted to local areas and some regions and also can be verified a scarce numbers of studies using vital registration data, which has historically been neglected in many countries in Latin America and particularly in Brazil.

Although a strong relationship has been recognized to exist between diverse social and economic indicators and mortality rates, very little is known about such associations in the country. It is believed that the urban data in Brazil are reliable for most capital's cities, but even so, no study aimed to assess the effects of the more recent economic and social changes of mortality levels has been carried out. Therefore, the main goal of this paper is to examine trends, differentials and determinants of the main causes of the elderly mortality for the urban population in Brazil from 1990 to 2000 and find out associations with socioeconomic indicators as well as present some socioeconomic consequences for 2000 by sex.

Method

The capital cities were taken as a proxy of the urban population and the basic data were obtained from the System of Information of Mortality of the Ministry of Health for all 27 capital cities in the country for the average of the year's 1989/90/91 and 1999/2000/01. The study considers mortality by sex and five-year age group from age 65. The cities were classified according to the quality of the registry of death. Death causes were classified in agreement with Ninth and Tenth revision of the ICD for the correspondent years. Although a bridge-coding between these two ICD revisions is a

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problem, the percentage of deaths by groups of cause were calculated in order to have an indication of the elderly epidemiological transition trends. These groups of causes were split according to the main sub causes. Then, Standardized Mortality Rates by causes were calculated by age and sex for all selected cities and the total urban of the country for 2000.

For the study of the associations between the mortality rates by the leading causes of deaths and eleven socioeconomic indicators (*per capita GNP, illiteracy rate, number of doctors for inhabitant, women's proportion in the labor work, percentile of residents with inadequate sanitary draining, total fertility rates*, etc.), generalized linear models were used and the final model was selected using the "stepwise" procedure for the leading causes of death. The impact of different causes was considered by means of a decomposition of the correlation into cause-specific associations. The diagnosis stage of the linear regression model consisted of the verification of the distance in relation to the hypotheses of the regression model, presence of outliers, presence of influential points (the *distance D of Cook*) besides the multicollinearity problems. The analysis of the "residues" was proceeded through graphic means.

Discussion

Criteria were established in or order to assess the quality of the deaths for all cities. The conclusion was that the quality of data presented a high level except for a few cities, which were eliminated. For those cities, which percentage of ill-defined causes of death was considered relatively high, a redistribution of them was preceded using Lederman's procedure, which weighs up an adjusted factor for each involved cause of death.

The elderly urban population grew in different rhythms in the great areas of Brazil. Therefore, the regional characteristics are reflected in the several groups of deaths causes. Diseases of circulatory system, followed by cancers and then respiratory diseases, were all more substantial causes of death in more developed cities than in less ones.

Despite the rapid increase of the proportion of elderly population and the economic recession of the 90's, mortality rates of the elderly in the urban country decreased significantly for several causes of deaths and a sex-gap emerged and widened as a byproduct of a larger decline in female mortality. But the rapid decrease was not enough to eliminate the presence of ill-defined causes for some cities among the main causes of death and also to break the increase of causes like diabetes and pneumonia and some types of cancer. An important reduction in mortality rates for diseases of the circulatory system occurred. In contrast, neoplasm and in particular respiratory diseases inflated urban mortality figures. These causes of death were the key points of the elderly mortality

transition in the period. The following emerged as leading causes: *Cerebrovascular diseases, Myocardium acute infarct, Diabetes mellitus, Pneumonia, Malignant neoplasm of trachea, bronchus and lungs, Malignant neoplasm of prostata, Malignant neoplasm of breast cancer*. In fact, these causes almost match with the leading causes found for Brazilians states, probably because the population of the capital's cities represents an important weight on their respective states.

For most causes of death, marked geographical variations in mortality rates were found among the elderly population, reflecting socioeconomic differences, particularly between the more and less developed cities. The advancements and backwards of elderly mortality in the urban areas in Brazil suggest a weak and uncertain development in the 90's decade. Despite the social and economic deceleration in the period, the trends suggest a predominance of the chronic-degenerative diseases e a control of the infectious and parasitic diseases.

The ecological analysis of capital-level data revealed a significant association between elderly mortality and a set of socioeconomic indicators for both sexes. For this purpose generalized linear models were used for each cause of death and the impact of different causes was considered by means of a decomposition of the correlation into cause-specific associations. Nevertheless, the magnitudes of the multiple correlation coefficients were not very high. Although it was found significant associations and despite of the important regional differences, there are not strong evidences that the most developed capital cities are in a more advanced step of mortality transition in the country.

It can be find some contradictory findings, for instance: high levels of neoplasm and m*yocardium acute infarct* can be found in both less and most developed cities.

The most immediate consequence of the widening gap between male and female mortality is an imbalance in the number of elderly people and the result of this imbalance in numbers appears in the marital status of old people. So an increasing proportion of women remain widows. This paper also presents some aspects of economic burden resulting from mortality in 2000 in Brazil. The elderly mortality patterns are translated to direct costs, person years lost, and indirect costs to society as a result of those losses. Elderly deaths are higher for men, but women report more illness and disabilities, and they report higher rates of utilization of medical care services. This leads to a lower lost earning for men. Among the major diseases, the cost of heart disease rank highest.

In spite of the Brazilian's health system does not seem prepared to care and assist the increasing number of elderly in the urban population, it can be noted an improvement of the general conditions of health for the 90's decade. Several issues still remain to be

clarified and are puzzling. The analysis done in this work perhaps could contribute to understand and trace not only the Brazilian but also the scenery of the urban mortality for elderly in others Latin-American countries.