Projections of the Brazilian elderly population in 2050: a differentials of aging between the states, metropolitans and not metropolitans regions approach

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Introduction

Since the last decades the past century, Brazil comes across a fast and an accelerated demographic transition process. This process is characterized with deeper age structure changes.

The Brazilian demographic transition began by mortality decline from 1940 until 1970 decade. The fast fall of mortality in this period didn't cause changes in the age distribution of the population in direction to a greater relative aging. So, the reduction was attributed, mainly, a decline in the children's mortality specific rate. As consequence, greater ratio of children had survived compared with adults and older. This effect was similar an increase the fertility (Carvalho, 1993).

The levels mortality reduction in the children by infection disease improved the life expectancy. The life expectancy raised about 30 years between 1940 and 1996, changing of 37,6 to 64,8 years between the men and of 39,4 to 72,6 years between the women. In 2000, the women had presented life expectancy eight years greater, compared with the men (IBGE, 2000).

The end of the sixties decade started sharp and general fertility decline in Brazil. From 1950 to 1970, the fertility level declined in 6,4%, and from 1970 to 2000 was reduced 60.3% (IBGE, 2006). The total fertility rate changed of 5,8, in 1970, to 2,3 children/woman in 2000. The fertility decline caused a reduction of population growth. The deceleration of the annual growth of a number of births to caused an accelerated aging population process (Carvalho & Garcia, 2003).

The fertility decline reduces the growth demographic rate and causing an important change age distribution. In turn, the mortality decline presented as only consequence the significant increase the Brazilian population growth speed, without impacts on the age structure (Carvalho, 1993). Therefore, the fast and supported fertility fall make a decision of the Brazilian aging population process. The mortality fall contributes for population aging when this if concentrates in the most advanced ages. So, it will occur an increment in the absolute number of aged (Carvalho & Garcia, 2003). In Brazil, this stage of the aging process already meets in progress.

According to Organization of United Nations (ONU), from 1950 to 2000, the Brazilian population increased from 54 million to 170 million, and to expect in 2050 it will reach 244 million. In the last decades of XX century, the population of

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15 years and below increased from 22 to 50 million, has remaining itself in this platform until 2050. The population aged 65 years and over increase of 1,6 million, in 1950 to 8,7 million in 2000 and, probably, 42 million, in 2050. Thus, while the young population will duplicate, the aged one would grow in 26 times in 100 years.

As the beginning and the intensity the Brazilian fertility decline didn't occur simultaneously and with the same intensity between the Brazilian regions. The fertility levels were different between the regions. It was observed a difference aging evolution. The north, northeast and southeast regions happened the slowest aging population process, during the period from 1950 to 2050 (Moreira, 1999).

Thus, to get old age started to be usual, exactly in the poor countries (Veras, 2002). This new situation has important implications for community, family, economic, social, and health sector, which is expected to have a major impact of the society because the older growth it isn't the sufficient. It is also to reach an improvement of the quality of life this population.

It's important to establish the growth trend because this information is of great relevance for the public politics. The projections of the amount of older for a future in Brazil they help to understand and to anticipate the problems and demands this population segment that more increase in the country.

The main objective of this work is to project the Brazilian aged population, according to gender and age, in 2050, trying to analyze the differentials of the demographic aging process of the Brazilian population for the states, metropolitan and not metropolitan regions.

Methods

Data comes from Brazilian Demographic Census. The projections were carried out by relation of cohort method proposed for Duchesne in 1989. This method calculates the projections for gender and ages groups. It does provide the survivals relation, of one determined period, considers the joint effect of mortality and migration. To each step of the projection the method prorrata was used.

For Brazilian population projection in this study the method describe suffered alteration for the population's estimate. For the 0 to 4 age group was chosen to work with *relations child-woman* (Lee, 1957). This method is:

$$_5 N_0^{t+5} =\ _5 RCM_{0>}^{t+5}\ _5 K_0^t\ _{30} N_{15,f}^{t+5} \qquad (1)$$

$$_5 K_0^t =\ _5 RCM_{0,<}^t /\ _5 RCM_{0,>}^t = (_5 N_0^t /\ _{30} N_{15,f}^t) / (_5 R_0^t /\ _{30} R_{15,f}^t) \qquad (2)$$

where:

$_5 N_0^{t+5}$ it's the population of the smaller region for the 0 to 4 age group the aged, t year; $_5 RCM_{0,>}^{t+5}$ it's a child-woman ratio, for the 0 to 4 age group, in the bigger

region, in the t+5 year; $_5 RCM_{0,<}^t$ it's a child-woman ratio, for the 0 to 4 age group, in the smaller region, in the t year; $_5 RCM_{0,>}^t$ it's a child-woman ratio, for the 0 to 4 age group, in the bigger region, in the t year; $_5 N_0^t$ it's the population of the smaller region for the 0 to 4 age group, t year; it's the population of the smaller region for the 0 to 4 age group, t year; $_{30} N_{15,f}^t$ it's the women population for the 15 to 44 age group of the smaller region, t year; $_5 R_0^t$ it's the population of the bigger region for the 0 to 4 age group, t year $_{30} R_{15,f}^t$ it's the women population for the 15 to 44 age group of the bigger region, t year.

Results

The results of the projections of states show an accelerated aging process of the Brazilian population and a difference of the aging process between the states. The state with a bigger trend of elderly population growth is the Paraíba (31.4%), followed by Piauí (30.8%), Rio Grande do Norte (28.9%), Espírito Santo (28.5%), Rio Grande do Sul (28.4%) and Minas Gerais (28.2%). Except to Amazonas, the number of women will be bigger for all the states. The amount of persons aged 80 years and over will be bigger in the states of the Paraíba (7.8%), Piauí (7.8%), Rio Grande do Norte (6.9%), Bahia (6.5%), Rio Grande do Sul (6.4%), Minas Gerais (6.3%), Espírito Santo (6.2%), Mato Grosso do Sul (6.2%) and Pernambuco (6.1%).

The results of the projections for the Brazilian metropolitans and not metropolitans regions show that the number of men and women older people will be well bigger in the not metropolitan region (24.1% and 27.5%, respectively), compared with the metropolitan region (20.3% and 26.2%, respectively). The number of old women will be bigger that the old men in all the age to both regions. The number of people aged 80 years and over will be greater in the not metropolitan region. The biggest aging population will occur in the not metropolitan region.

Conclusion

These numbers allow us to reflect and to anticipate the difficulties that the Brazilian society will try in such a way with Brazilians elderly population growth in 2050. The fast aging process will cause an extraordinary social, cultural, economic, politics and health consequences, which the country probably will not be prepared. Therefore, the challenges will be many faced to keep or improve the well-being and the life of quality of the Brazilians older population. It's essential to enclose the older people in the priorities of the government.

In this way, the public politics for the persons aged 60 years or more they will far more effective when combinated with the other aspects, such as improve the health, medical assistance, socioeconomic conditions, work market, social welfare, capital and properties transference, composition and organization of the families.

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