Future population of Atomic bomb survivors in Nagasaki

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Abstract and Objective

The Nagasaki University Atomic Bomb Survivor Database, which was established in 1978 for elucidating the long-term health effects of the atomic bombing, has registered since 1970 about 120 000 atomic bomb survivors with a history of residence in Nagasaki city. Since the number of atomic bomb survivors has steadily been decreasing, prediction of future population is important for planning future epidemiologic studies, and we tried to predict the population of atomic bomb survivors in Nagasaki city from 2008 to 2030.

Keywords:

Atomic bomb, Survivor, Population, Database, Epidemiology

Introduction

On 9 of August 1945, Nagasaki city was exposed to the second atomic bombing. The government of Japan commenced in 1957 support of people officially recognized as atomic bomb survivors (survivors in short). The governmental supports include free health examination twice a year, and allowances according to their health status. Since 1970, information on health status of survivors including mortality and regular health checkups has been collected from local government and has been stored in the Nagasaki University Atomic Bomb Survivor Database. Since the number of atomic bomb survivors has steadily been decreasing and they were on the average aged 74.8 yrs in 2007, prediction of future population is important for planning future epidemiologic studies.

Methods

A total of 119 324 survivors with a history of residence in Nagasaki city between 1st April 1970 and 31st March 2007 were followed up and their registration status was confirmed: 1) newly registered (NR), 2) moved into Nagasaki city (MI), 3) moved out from Nagasaki city (MO) and 4) died in Nagasaki city (DE). The sex- and age-specific number of survivors in each category was calculated for each year between 1970 and 2007. The population from 2008 to 2030 was estimated under the following assumptions: a) the sex- and age-specific number of NR and MI in those aged 90 yrs or less is same as that in 2007, and is zero in those aged over 90 yrs; b) the sex- and age-specific moving out rate is same as that in 1997-2007; and c) the sex- and age-specific annual mortality rate since 2008 decreases according to the exponential curve which was fit to the observed mortality rate from 1970 to 2007.

Results

As of 1st April 1970, there were 77 370 survivors living in Nagasaki city, and their average age was 48.0 yrs. The number of survivors estimated to be living in Nagasaki city in 2010 and in 2030 was 39 997 (76.9 yrs) and 11 286 (90.9 yrs), respectively; the parenthetic entities denote the mean age in respective years. Figure 1 shows sex- and age-specific distribution of survivors in Nagasaki in 1970, 2010 and 2030; the number of survivors aged 90 yrs or over in respective years was (will be) 57 (0.1%), 2550 (6.4%), 5839 (51.7%), and those aged 100 yrs. or over was (will be) 0, 102 (0.3%), 720 (6.4%), respectively.

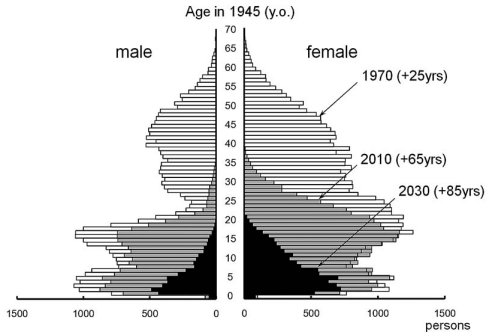

Figure 1- Population distribution in 1970, 2010 and 2030

Conclusion

We estimated that there will be 11 286 survivors in Nagasaki city, who will be 90.9 yrs on the average and 720 of them will be 100 yrs or over. Follow-up of survivors will provide us with valuable information on the study of healthy elders.