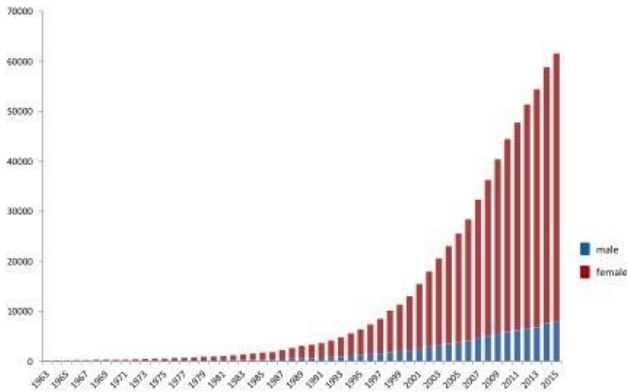


# Longevity insights from demographic, phenotypic and genetic studies

12 January 2018



Centenarians in Japan between 1963 and 2015. Credit: Keio University

Understanding the demographic, phenotypic and genetic features associated with ageing has been the subject of many studies worldwide. Japan offers a unique opportunity for such studies since it has a large population with a very high longevity rate. Recent studies have shown that the number of centenarians in Japan increased from 154 in 1963 to 61,568 in 2015, and has increased 4.2-fold between 1996 and 2006, compared to an increase of 2- and 1.6-fold in France and Denmark, respectively.

Researchers in Japan have previously shown that Sirt1 overexpression can alleviate [acute kidney injury](#) in a Sirt1-overexpressing mouse model. The same group has now established the mechanism that links, at least in part, Sirt1 with the pathogenesis of renal damage in diabetes.

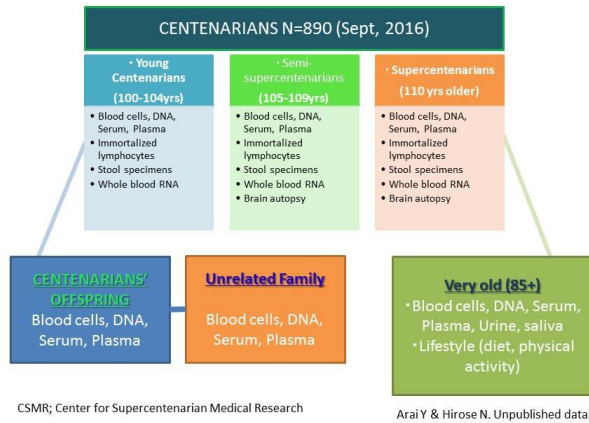
In a recent review, Yasumichi Arai and colleagues at the Keio University School of Medicine give an overview of previous and current findings relating to the health status of centenarians in Japan. Interdisciplinary studies revealed that approximately 20 percent of centenarians had

reasonably high functional capacity and enjoy physical and cognitive independence. Furthermore, those who were independent at the age of 100 were more likely to reach 105 (semi-supercentenarians) and even 110 (supercentenarians). These findings prompted the group to shift their research to focus on semi-supercentenarians as a model of healthy longevity.

Despite [cardiovascular disease](#) being the leading cause of death in old age, centenarians have a low risk of cardiovascular disease, with low prevalence of atherosclerosis. Prevalence of diabetes is only 6 percent in centenarians compared to 14.7 percent in the [general population](#) aged in their 70s. The prevalence of hypertension was about 60 percent, however, this was paradoxically found to be associated with high levels of physical and cognitive function. The authors used data from several longevity studies in order to investigate several factors, including haematopoiesis, inflammation, liver function and cellular senescence, and their association with capability and cognition during ageing. Low-level of inflammation was found to be correlated with survival, capability and cognition. Telomere length, which is a marker of [cellular senescence](#), was more efficiently maintained by centenarians and their offspring compare to the general population. The authors have now started a whole genome sequencing analysis of supercentenarians, semi-supercentenarians, and young centenarians.

The authors conclude that "[centenarians](#) and particularly supercentenarians can live active lives, or they have at least done so for the majority of their very long lives." Regarding the DNA sequencing study and they are confident that the whole genome sequencing and analysis of these distinct centenarian cohorts will provide clues for identifying genetic factors that could contribute to healthy longevity.

### Multiple Cohort Studies of the Oldest Old managed by CSMR at Keio University



Credit: Keio University



Credit: Keio University

**More information:** Yasumichi Arai et al. Demographic, phenotypic, and genetic characteristics of centenarians in Okinawa and Honshu, Japan: Part 2 Honshu, Japan, *Mechanisms of Ageing and Development* (2017). [DOI: 10.1016/j.mad.2017.02.005](https://doi.org/10.1016/j.mad.2017.02.005)

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