

## Future directions for research on the contributions of dental and oral health to a healthy aging society

### Aging society : Cause for both celebration and concern

The number of people in Japan aged 65 years and over reached 30.74 million in 2012, topping the 30 million mark for the first time ever. As a result, elderly people now make up 24.1% of the population, with those aged 65-74 years accounting for 12.2% and those aged 75 years and over accounting for 11.9%.<sup>1)</sup>

Meanwhile, social security benefits in Japan totaled 107.5 trillion yen in fiscal year 2011. Broken down by sector, 49.4% of this sum went to pension payments, 31.7% to medical care, and 7.3% to long-term care.<sup>2)</sup> These expenditures have been continually increasing since the national health insurance system was instituted in the 1960s, giving rise to concerns about the financial viability of the system. In order to maintain the sustainability of this system without sacrificing quality, the most urgently needed health policies are: 1) establishment of a more smoothly integrated system of healthcare provision based on efficient cooperation and information sharing among professionals and organizations in all related fields and 2) preventive measures against non-communicable diseases (NCDs), which are currently the primary cause of death. In other words, Japan—which implemented its universal health insurance system in 1961—now must confront the challenging task of rebuilding its social security system in order to maintain and ensure a vigorous and healthy society of longevity.

In this context, we must discuss how the field of dental care and oral health can contribute to the realization of healthy longevity. The goal of dental care and oral health is the lifelong maintenance of oral function, and empirical evidence establishing a relationship between oral health and systemic health has been accumulating since the turn of the century. However, in Japan as in most countries, dentistry and medicine have developed separately in terms of their respective education systems as well as government funding, so it has heretofore been difficult to bridge the divide and firmly position dental care and oral health as contributing to general health within the framework of health policies.

### Determinants of average life expectancy and healthy life expectancy

Since the 1980s, Japan has been the world leader in terms of longevity, reaching an average life expectancy of 79.9 years for men and 86.4 years for women in 2012.<sup>1)</sup> Coupled with a remarkable downward trend in the birth rate, further increases in longevity will lead to an even more pronounced aging of the population structure. Our society is aging at a speed that has never been experienced by any other developed country.<sup>3)</sup> Moreover, looking at the age-specific survival status on a 2012 life table, the average remaining years of life expected for a 75-year-old is 11.6 years for men and 15.3 years for women. Furthermore, the proportion of survivors at that age is 72.1% in men and 86.5% in women, and 90-year-old survival rates for men and women are 22.0% and 46.1%, respectively.<sup>1)</sup> The life span that must be taken into account from the perspective of health care is thus much longer than the average life span.<sup>4)</sup>

There is no doubt that many Japanese people desire to not simply live long lives but also to prolong their functional independence in daily living activities for as long as possible. Our society, therefore, must function in such a way that disabled people receive proper health evaluation and health care.

It has been pointed out that the rate at which the average Japanese life expectancy grows has been gradually slowing down since the 1980s. However, given that the upper limit of human longevity is likely around

120 years, we still have plenty of room to extend our average life expectancy further.<sup>5)</sup> At present, the percentage of people in need of care is 3.0% for those aged between 65 and 74 years old, and 21.9% for those aged 75 years or older. Moreover, over the past five years there has been an annual increase of 0.14 year for men, and 0.09 year for women, in the average years of independence.<sup>6)</sup> The goal is to prolong the average years of independence, and, given that life expectancy reflects social policy choices, it is also necessary to continue making efforts to further extend life expectancy as much as possible. In fact, one study has shown that, while disease prevalence rates are rising along with population aging across the world, disability rates are actually decreasing.<sup>6)</sup>

As such, in order to achieve a healthy aging society, the following four health policy priorities should be established: 1) to increase life expectancy and prevent early death, 2) to prevent the elderly from transitioning from independence to dependence, 3) to prevent a decline in daily living functions due to aging, and 4) to promote health from the early years of adulthood.

Above all, taking measures against diseases that result in death and conditions requiring care is an obvious goal. The percentage of people who die due to the primary causes of death among the Japanese (such as cancer, heart disease, pneumonia, and cerebrovascular disease) is approximately 70%. By fighting against these diseases, the resulting extension of life expectancy is estimated at about 3–4 years for cancer, 1.5 years heart disease, and 1 year for pneumonia and cerebrovascular disease.<sup>1)</sup> Moreover, the diseases that most often lead to conditions where continuing care is required are cerebrovascular disease, dementia, and fractures resulting from falls. Preventing these conditions as well as joint disorders will go a long way towards extending the period of independence among the elderly.

As for extending life expectancy through health promotion measures, it is estimated that the average life expectancy would increase by 1.8 years in men and 0.6 year in women if all adults were to quit smoking, and by 0.9 year in both men and women if high blood pressure controlled so as to minimize its adverse effects on health.<sup>7)</sup> Moreover, to further enhance the health of the population, it is necessary to make improvements in other risk factor areas as well, such as hyperglycemia, lack of exercise, drinking, obesity, and high salt intake.

The factors that damage health are genetic, lifestyle-related, social security/health system-related, and social determinants. Among these, genetic factors account for about 25–30 % of all conditions leading to death. A larger proportion of deaths, however, are due to lifestyle and social environment, so these factors should be taken into consideration when evaluating disease risk. It is necessary to identify and clarify the relationship between these factors and dental care/oral health and healthy longevity.

### Senescence and the decline of daily living functions

Apart from diseases, other causes of death include senescence and accidents. Whatever the reason, when organs, which are made up of cells, can no longer function, humans become incapable of maintaining the basic functions of life. Senescence is defined as the changes associated with a gradually progressing decline in physical functions due to aging.

Despite this decline in organ functionality due to aging, the organs function in a complementary manner to maintain the condition where everyday life is carried out without any trouble. However, a variety of different causes lead to various physical and psychological symptoms and conditions commonly observed in the elderly, which are collectively referred to as geriatric syndrome.<sup>8)</sup> This often leads to a decrease in activities of daily living (ADL), and at this stage complete recovery becomes unlikely.

In terms of oral function, the number of teeth, which are necessary for the daily eating function, decreases with aging. From this perspective, the aging of the oral cavity as an organ should be kept distinct from the individual oral functions.<sup>9)</sup> Further investigation is required to find out the extent to which maintenance of dental and oral health can delay the aging process.

Conceptual pathway from dental care and oral health to healthy longevity

The relationship between dental care/oral health and overall healthy longevity is shown in Figure 1. This is a hypothetical conceptual scheme which provides an organizing framework for research which addresses questions relating to the link between dental/oral health care and general health. Such research would likely entail investigating the extent to which maintenance of dental/oral health and recovery of oral functions lead to the maintenance of QOL and ADL or extend life expectancy, or the extent to which dental/oral health care contributes to improvement of nutrient intake and lifestyle habits, and the maintenance of social functions.

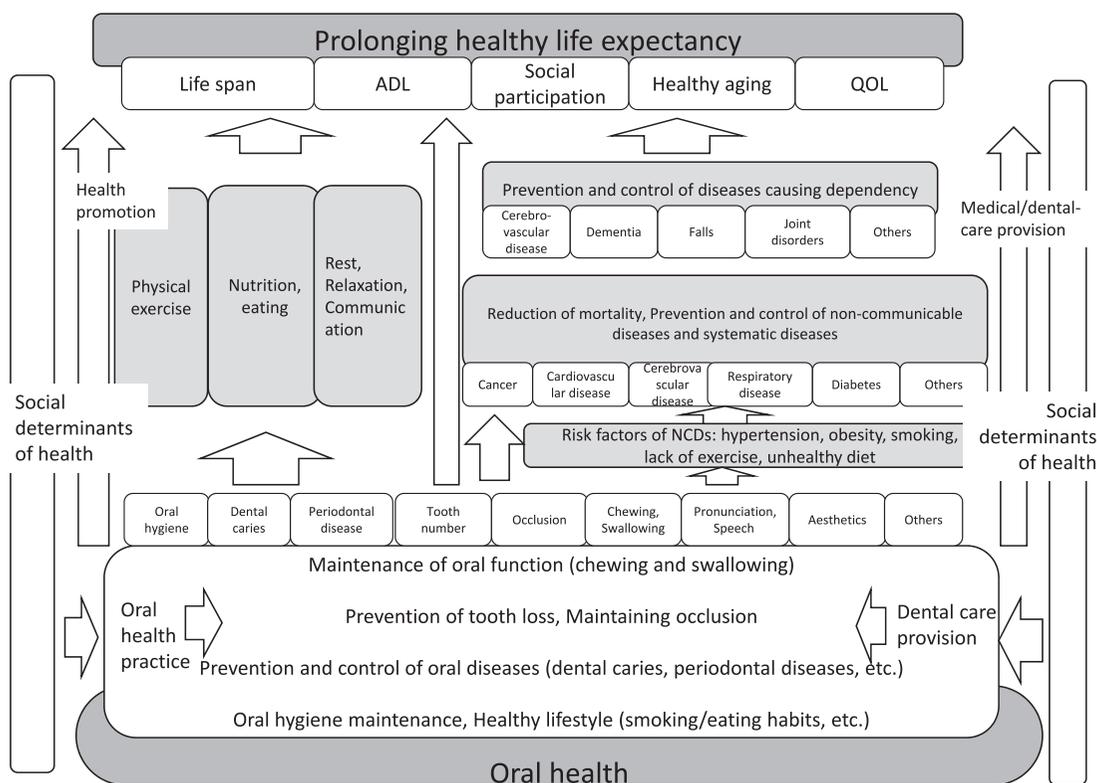


Figure 1. Conceptual pathway from oral health to healthy longevity

The relationship between oral and general health and life expectancy, as described above, is sometimes referred to in terms of the functions and conditions of individual organs, so great caution is required when attempting to represent the overall pattern of cause and effect schematically in a single figure such as this. On the other hand, in order to provide persuasive explanations to policy makers as well as the elderly themselves, it is necessary to formulate a simple and readily understandable representation of the relationship between oral and general health.

There exists a small but growing body of empirical evidence regarding the relationship between oral health and general health (in areas such as general mortality, systemic diseases, and nutrition).<sup>10-14)</sup> However, the research on this relationship is still unfocused and insufficient, so there is a great need for vision and direction to guide future research and policy in this area. We need an integrated system of research and information sharing among health professionals in both dental and medical fields in order to achieve an effective

tive health policy for the 21<sup>st</sup> century.

Japan instituted a universal public health insurance system and achieved longevity at a rate unseen anywhere else in the world, and now we stand at the forefront of the international community in the field of health and medical care. The whole world is watching to see how Japan will tackle the challenge of achieving a society of longevity that is also healthy.

As a part of overall solution, there is no question that dental care and oral health will play a significant role. In order to propose and implement health policies that clearly recognize the importance of dental care/oral health within the Japanese social security system, it is essential that we organize and clarify the existing evidence and then set priorities regarding the further accumulation of such evidence in the future.

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