

## Changes of DFT as a function of birth year in the Japanese population

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**Abstract** : The purpose of this study was to analyze the number of Decayed and Filled Teeth (DFT) recorded in the Japanese National Survey of Oral Health by birth year cohort.

The DFT values recorded in the nine Japanese National Surveys, which were conducted at six-year intervals between 1957 and 2005.

Based on the birth year cohort, DFT with age could be divided into three groups: old generation, middle generation and new generation.

It is suggested that we must think the different strategy for each generation.

**Key words** : DFT, Birth year cohort, National Survey of Oral Health, Japanese

### 1. Introduction

In recent years, the prevalence of dental caries has declined, especially among young people. It is expected that the number of decayed, missing and filled teeth (DMFT) at the age of 12 years would reach 1 in Japan. A mean DMFT of 1 at the age of 12 years may indicate that most subjects have no experience of dental caries and not visited a dental office. As a result, they have little interest in oral health and do not make the effort to perform oral care. Therefore, it is urgently necessary to estab-

lish oral health-centered dentistry, which focuses on people who have a sound oral cavity, instead of treatment-oriented dentistry.

This new outlook in dentistry has already been applied in oral examination, especially in assessment of dental caries based on the International Caries Detection and Assessment System (ICDAS)<sup>1,2)</sup>. The objective of oral examination has changed from the detection of oral diseases to estimation of oral health because of an increase in sound teeth. It is needed to rearrange the results of dental caries followed by the WHO criteria of dental caries. The purpose of this study was to analyze the number of Decayed and Filled Teeth (DFT) recorded in the Japanese National Survey of Oral Health by birth year cohort.

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## 2. Materials and Method

The DFT values recorded in the nine Japanese National Surveys, which were conducted at six-year intervals between 1957 and 2005<sup>3)</sup>, were used for birth year cohort analysis. The subjects above 5 years old were divided into groups with an interval of six years of age, and the values in each age group recorded every six years in the National Survey were analyzed by birth year cohort. There were a total of fifteen birth year groups: 1905-1910, 1911-1916, 1917-1922, 1923-1928, 1929-1934, 1935-1940, 1941-1946, 1947-1952, 1953-1958, 1959-1964, 1965-1970, 1971-1976, 1977-1982, 1983-1988, and 1989-1994. The DFT in each group was evaluated to calculate the average value within six years. The change of DFT in each birth year group was analyzed.

## 3. Results

Figure 1 shows the changes in DMFT and DFT with age based on the most recent results of the Japanese National Survey conducted in 2005. It reveals that the linear correlation between DMFT

and age was the same as in the previous nine Japanese National Surveys on DMFT. However, DFT increased until the age of 45 years along with increase of DMFT, and then showed a decrease.

Figure 2 shows the changes of DFT with age in the previous nine Japanese National Surveys on DFT. All changes of DFT with age revealed the same chevron transition. The result of 2005 reached the highest value around the age of 40 years and then decreased. The highest value of DFT increased from 8 in 1957 to 14 in 2005. The change in DFT was nearly 6 and 7.

The results of DFT as a function of birth year cohort are shown in Figure 3. In the subjects born before 1945, DFT showed a chevron transition change with age in each national survey; it increased until the age of 40 years, peaked and then decreased. In the people born between 1946 and 1970, DFT was high compared to the DFT before 1945, reaching the highest value at 14 and then decreasing gradually. In the people born after 1970, the DFT was low followed by a low DFT at

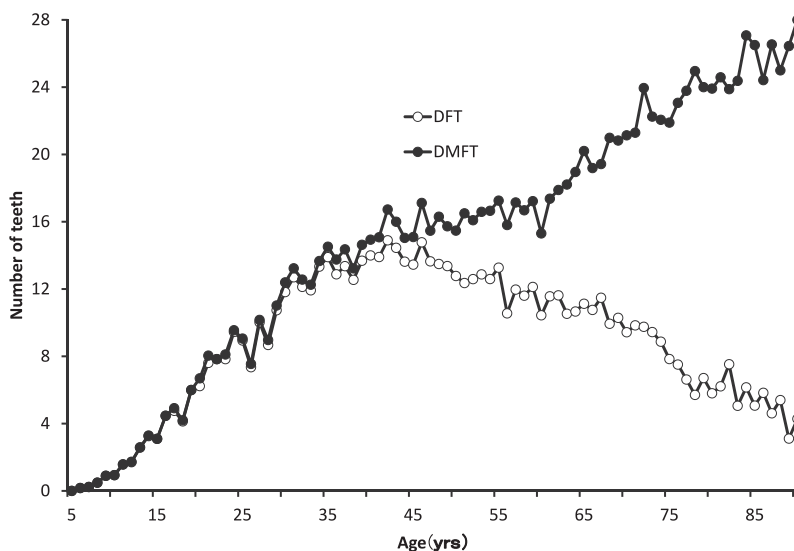


Fig. 1 Changes in DMFT and DFT with age in the 2005 Japanese National Survey

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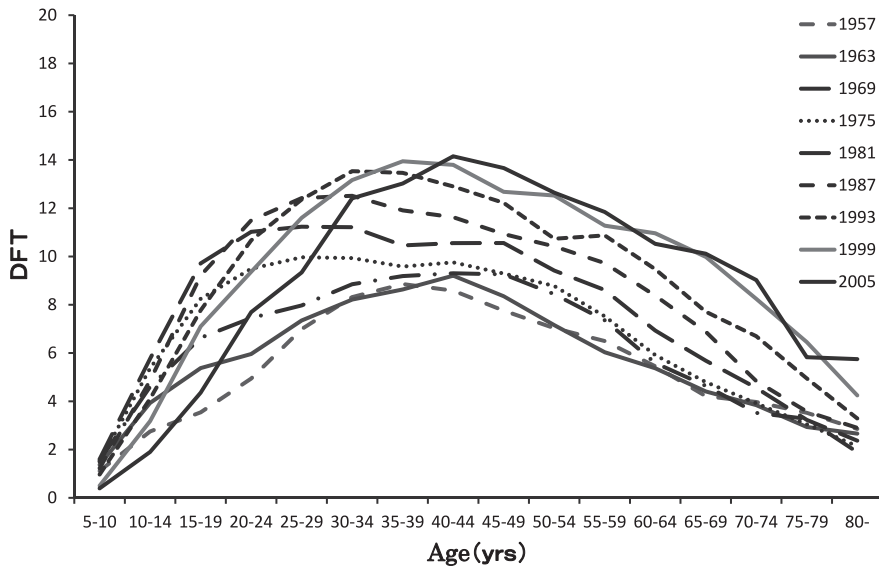


Fig. 2 Changes in DFT with age in each of the nine Japanese National Surveys of Oral Health

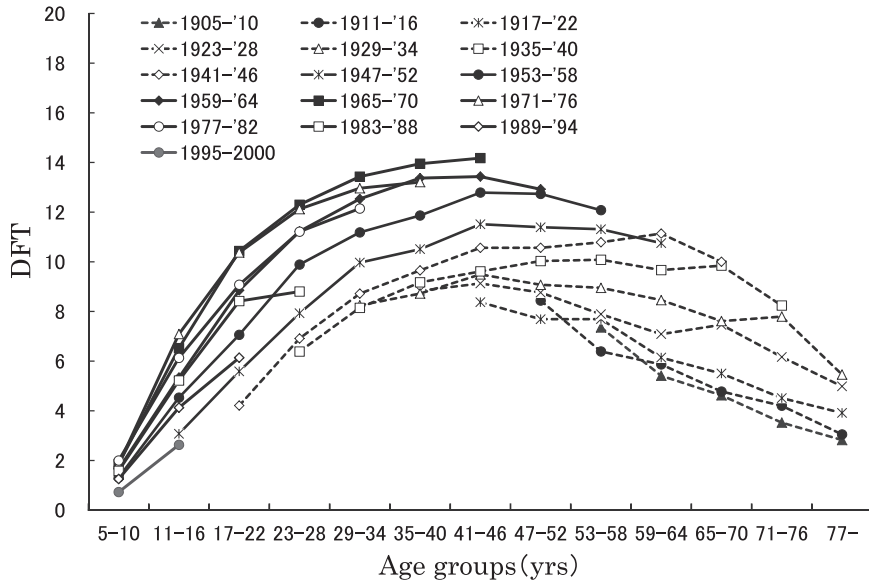


Fig. 3 DFT in each age group as a function of birth year

the age of 12 years and this low value was maintained with age.

4. Discussion

In general, it is thought that DMFT increases linearly with age, mainly because dental caries

does not heal naturally and is an accumulating disease. However, we feel that the oral health of the general population is improving each year. Therefore, it is unclear why the correlation remained the same in each national survey. As DMFT includes decayed, missing and filled teeth, this

study aimed to elucidate the change of DFT using birth year cohort analysis.

1) Cross sectional results of DFT in past nine Japanese National surveys

The relationship between DFT and age appeared to be of chevron transition. It is assumed that the increase of DFT until the age of 40 years reflected the increase in DMFT shown at 12 years of age<sup>4</sup>. It means that the dental caries seen in a child is carried on when he/she becomes an adult. On the other hand, the decrease in DFT after the age of 40 years may correlate to the increased number of missing teeth. An epidemiological analysis of missing teeth has to be conducted to clarify this point. The highest value of DFT in chevron transition at the age of 40 years changed from 8 in 1957 to 14 in 2005, and the mean change was 6. This high value can be associated with the increased number of missing teeth after 40 years of age. A mean DFT of 8 indicates that the DFT is 1.3 in each of the six sextants and for a mean DFT of 14, the

value would be 2 or 3 in each sextant. It remains to be determined which teeth and tooth surfaces are more susceptible.

2) Results of birth year cohort analysis of DFT

Based on the birth year cohort, DFT with age could be divided into three groups: old generation, middle generation and new generation.

(1) Old generation (people born between 1907 and 1945; 95-62 years of age)

The change of DFT in this generation showed chevron transition which peaked at the age of 40 years as in the cross-sectional results of each national survey (Fig.4. 1). The DFT then increased with late birth year as shown in Fig.4. 2. This increase over 40 years of age is bigger than under 40 years of age. The DFT before 1945 was low, which shows that the Japanese society was poor as a material civilization and the people led an anti-caries life style.

(2) Middle generation (people born between 1946 and 1970; 63-33 years of age)

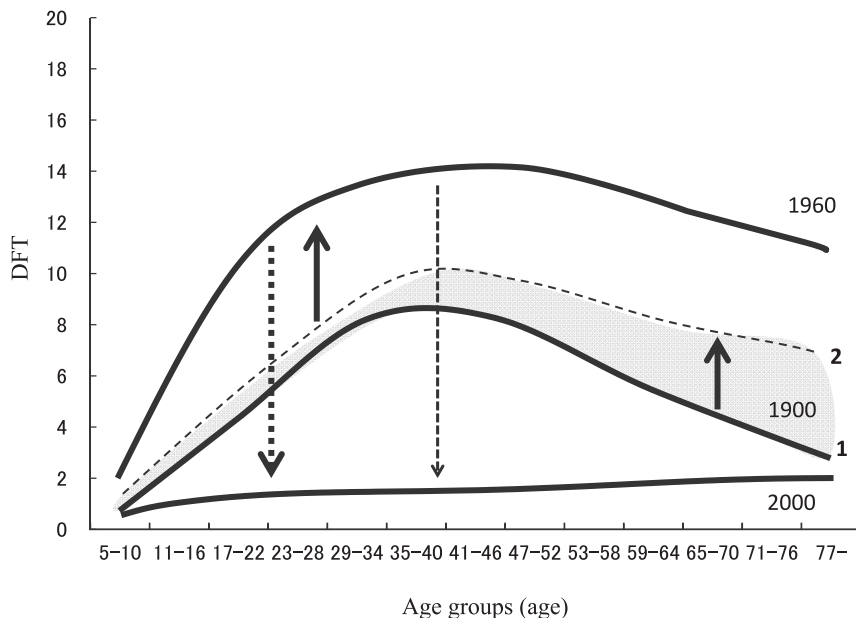


Fig. 4 DFT in each age group as a function of birth year

The increase of DFT in this generation before 40 years of age was remarkable and was the highest recorded in Japanese history. This increase of DFT indicates that dental caries is a result of the emerging civilization with introduction of western culture, food styles, convenience stores, family restaurants, and the Japanese society has changed from a traditional society to a substrate-full society which means that the Japanese can somehow obtain anything anytime and anywhere. The highest value of DFT in this generation was 14 with a DFT of over 2 in each sextant. It is interesting that the DFT does not exceed 14 and show even higher values. The incidence of dental caries is more in specific areas, such as the pit and fissures in molars and interdental areas.

The stable or slightly declining DFT after 40 years is supposed to be associated with the decrease in the number of missing teeth. It indicates that many teeth are retained in the mouth. An epidemiological study of the missing teeth is required.

- (3) New generation (people born after 1971 ; above 32 years of age)

The DFT in this generation was low, and is expected not to increase in the future. The goal of future dentistry is to maintain this low value of DFT.

It appears that in the 20th century, dentistry was focused on treating the increased DFT in old and middle generations. In future dentistry, the sound teeth, decayed teeth and filled teeth are retained; therefore, dentists must evaluate not only decayed teeth, but also the quality of teeth, root caries, tooth wear, tooth stains and secondary caries. A new system to assess these changes of tooth quality must be introduced.

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