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Perspective article

# The standardization of oral health screening survey in Taiwan



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Oral examination is a basic technique and tool in dentistry. It is an indispensable task in clinical practice, epidemiological survey, and health policy formulation. Establishing the standardization of oral health screening survey through consistent training programs for oral health care providers (especially dentists) is the most important prerequisite for dental treatment, oral disease prevention, and health administration. In addition, the standardization of oral health screening survey will help to improve the quality of oral examination and clarify the true situation of dental caries among the public and evaluate the effectiveness of

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**A**

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| 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |

C-齲齒 X-缺牙 △-已矯治 /-待拔牙(因齲齒造成之殘根)  
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**D**

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4. 恆牙白齒之溝隙封填：☐無 ☐有
5. 治療急迫性：  
☐無  
☐一般牙科治療  
☐急需治療（發炎、腫脹、潰瘍、結石）

**Figure 1** The oral examination forms for students of the Japan-ruled Taiwan and the current Taiwan in this study. (A) The form in a primary school family contact book from the 1930s showing the simple record items. (B) The commonly used form today showing a complete record sheet. (C) Another commonly used form including 15 oral conditions to meet the oral examination items required by the Ministry of Education.

dental caries prevention. Therefore, how to achieve the standardization process of oral health screening survey is crucial to the development of dental science and preventive medicine.

The World Health Organization (WHO) used the decayed, missing, and filled teeth (DMFT) index for dental caries since the 1950s. Its advantage is as an objective indicator for the prevalence of dental caries in different regions and different time points to be compared, allowing for more accurate planning of oral health policy formulation and utilization of medical resources.<sup>1</sup> However, this index has been used for more than 70 years, and has always faced some problems and challenges.<sup>2</sup> For example, the DMFT index is cumbersome and time-consuming to implement, and difficult to interpret correctly. Moreover, there are discrepancies among the judgments of each examiner, making it difficult to achieve consistency in interpretation. This results in a contradiction between the actual caries prevention or treatment results and the DMFT index examination results, making a risk of bias in using the DMFT index to evaluate the effectiveness of caries prevention and treatment.

Through consensus and cooperation with the Ministry of Health and Welfare and the Ministry of Education, the Association of Family Dentistry, the Republic of China (AFDROC) referred to the basic screening survey (BSS) in the United States and developed an oral health screening survey suitable for Taiwan. This article called it the Taiwan oral health screening survey (TOHSS), reported the content of the TOHSS, collected oral examination forms for students of the Japan-ruled Taiwan and the current Taiwan, and compared them with the TOHSS.

Looking back at the history of oral examinations for students in Taiwan, the earliest regulations on student health examinations in Taiwan began with the Taiwan primary school children's health examination regulations in 1910, which also covered dental examinations. The regulations related to the children's health examinations were subsequently revised in 1921 and 1938. Both of them also included dental examinations.<sup>3</sup> A primary school family contact book from the 1930s showed that primary school children at that time had to undergo a health examination every year during their six-year study career, and the dental examination had two record columns (caries and missing teeth). The examiner recorded the number of carious or missing teeth in the upper or lower jaw as up/down and numerically (Fig. 1A). Except for a few schools that had the school dentists, the physicians performed the student health examinations including the dental examinations.<sup>3</sup> At that time, the medical equipment was relatively simple, and even in the schools with the school dentists, student dental examinations could only be conducted under the natural light.<sup>4</sup> The dental examination recorded by using simple items was suitable for the actual situation in those days.

(D) The Taiwan oral health screening survey (TOHSS) form including only 5 record items. (A) was taken from the personal collection of Feng-Chou Cheng, the first author of this article. (B, C and D) were available from the teaching materials of Dr. Yao-Hui Huang.

With the advancement of dental technology and equipment, the scope and level of detail of oral examinations have increased accordingly. According to the student health examination benchmark table announced by the Ministry of Education in 2020, the oral examination items for the high school students and below should include caries, missing teeth, malocclusion, oral hygiene, and other abnormalities, and the examination tools required the head mirror, probe, mouth mirror, standing lamp or flashlight, and gloves. Currently, many primary and high schools in Taiwan provide their students with health examinations including oral health items every year or every six months, and send the examination results, requiring their students with oral abnormalities to seek the dental treatment and report their dental treatment status. The vast majority of students follow this process, and under this system the oral health of our primary and high school students is well taken care of.<sup>5</sup>

The Ministry of Education does not specify the format of the oral examination form. The commonly used form is a complete record sheet, in which the examiner records the condition of each tooth of the examinee, including deciduous and permanent teeth, such as caries (C), missing teeth (X), treated teeth ( $\Delta$ ), residual roots to be extracted due to caries (/), impacted teeth ( $\psi$ ), supernumerary teeth (Sp.), and deciduous teeth to be extracted (h) (Fig. 1B). In addition, another commonly used form is to list 15 oral conditions to meet the oral examination items required by the Ministry of Education. The examiner records whether the examinee has these oral conditions, such as untreated caries, treated caries, caries experience on the permanent first molars, dental sealants on the permanent first molars, and 11 other conditions (poor oral hygiene, dental calculus, gingivitis, periodontal disease, deciduous teeth to be extracted, teeth to be extracted, supernumerary teeth, missing teeth, impacted teeth, malocclusion, and others) (Fig. 1C). However, the other 11 items mentioned above cannot be clearly defined and are not internationally accepted indicators. They are usually based on the personal professional judgment of the examiner and there is no consistent judgment standard. In addition, some items cannot be judged solely by visual inspection.

Too complicated oral examination items make them difficult to correctly interpret and the examination is time-consuming. In the general campus health examination environment, a dentist usually needs to complete oral examinations for hundreds of students in one health examination activity, which is almost an impossible task. Oral health surveillance and investigation are two very different things. From the perspective of health administration, oral health surveillance requires the ability to quickly and effectively identify the general trend of a group's oral health at a relatively low cost. The method of current campus oral examination in Taiwan is more like an investigation, which is more suitable for a smaller population sample. It is an academic activity that requires higher accuracy and details, and needs relatively more time. Therefore, the dental public health team of AFDROC developed the TOHSS with reference to the BSS in the

United States for a long time and began to implement training courses for the practicing dentists in 2024.<sup>6</sup>

The oral health indicators collected in the TOHSS are untreated decay, caries experience, caries experience on the permanent first molars, dental sealants on the permanent first molars, and treatment urgency (none, general dental treatment, and urgent treatment needed because of inflammation, swelling, ulcer, or dental calculus) (Fig. 1D). The TOHSS is a standardized method to collect oral health indicators, providing a framework for obtaining oral health data, which is inexpensive, easy to implement, and yet always consistent. Thus, the data from the TOHSS can then be compared across different programs, agencies, groups, and schools. Oral examinations should adjust the collected indicators according to the policy purposes. For promoting the TOHSS, conducting the standardized training for the dentists in oral examinations can help the dentists better meet the needs of the oral examination workforce.

In conclusion, the TOHSS is a method for dental caries monitoring, and its core values are simplicity, rapidity, economy, and effectiveness. It can be used in the campus oral examinations to play the role of oral health education and treatment reminders. It can also be used in health administration to understand and grasp the trend of oral disease changes in a timely manner, so that the government can better meet the needs of the dental public health when formulating health policies.

## Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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