## Division of Disease Control and Epidemiology Department of Oral Growth and Development

# [Members]

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# [Mission]

Our division's mission is to promote research that contributes to the oral health of community residents and to foster dentists with a public health mindset. Oral health issues are complex and multifaceted, requiring a comprehensive approach. The joint mission of dentists involved in oral health care is to reduce dental and oral health disparities caused by socioeconomic disparities.

We have established three pillars to address this mission. The first is the promotion of community oral health studies. Preventing dental diseases and maintaining and improving oral functions are of great significance in maintaining oral health and overall health. With the crucial cooperation of local governments and other organizations, we conduct field surveys and promote epidemiological studies to clarify the relationship between dental and oral health and systemic health and research related to dental health behavior. Second is essential research for the promotion of oral health and preventive dentistry. Through the accumulation of basic research, new methods of preventing and treating dental diseases can be found. We will continue to promote basic research with a public health mindset. Third, we will facilitate research on health services research in dentistry is the study of effectively delivering dental and oral health services research in dentistry is still insufficient in Japan. We will actively engage in new research areas, emphasizing our mission's need for multidisciplinary cooperation.

### [Representative Researches]

#### 1. Health services research in dentistry

Health service research on dental care requires an interdisciplinary approach that examines the relationship between social factors, financial systems, medical technology, access to medical care, and the quality and cost of oral health care. With grants from the Ministry of Health, Labour and Welfare (MHLW) Science Research Grants and other funds, our field conducts research related to workforce analysis of dental health care workers and the delivery system of oral health and dental care services in a super-aging society.

2. Epidemiological study on oral functions of older adults living in the community

Epidemiological research on factors related to the decline in oral function of older adults living in the community will significantly contribute to future dental health measures in Japan. In our field, we are developing assessment methods to identify declining oral function among older adults living in the community, developing applications to easily identify those with declining oral function, and researching effective intervention methods to maintain and improve oral function.

3. Epidemiological studies using receipt data

The importance of oral influences on systemic diseases, such as the relationship between periodontal disease and diabetes, is attracting increasing interest. In the field of health and hygiene, we are examining how the oral environment, including periodontal disease, affects systemic diseases and related medical costs, using big data such as receipt data and information on specific health checkups.

4. Behavioral science research on oral health behaviors

It has been reported that understanding and intervention from a behavioral science perspective is important in promoting health behaviors to maintain oral health. We are examining how psychological factors such as self-effectiveness influence oral health behaviors and oral health status, as well as researching effective intervention methods and their educational methods.

5. Oral diseases and epigenetic modifications

Since the involvement of epigenetic modifications was inferred when the oral cavity is exposed to toxic components for an extended period, we are investigating (1) DNA methylation of orally derived cells by LPS of *P. gingivalis*, (2) DNA methylation of gingival epithelial cells by heated tobacco, and (3) the effects of heated tobacco on methylation and aging in mouse gingiva.

6. Bacterial flora analysis using next-generation sequencers

We have established a technique to perform the entire process of bacterial flora analysis on campus using the next-generation sequencer MiSeq, analysis software QIIME2 and PICRUSt2. So far, we have (1) analyzed the oral microbiome of chewing tobacco addicts in Sri Lanka, (2) analyzed the oral microbiome of Behcet's disease patients, and (3) explored the oral microbiota altered by a new coronavirus vaccine.

7. Research on dental and oral health services for disabled people and older adults requiring care

We are conducting research on effective oral health care by understanding the actual status of dental and oral health care services for disabled people and older adults requiring care who reside in facilities.

8. A study on the implementation method of local governments in the Survey of Dental Diseases

The Survey of Dental Diseases is an important nationwide survey that obtains basic data to examine dental health measures and promote future policies. To efficiently conduct this survey, we are investigating the implementation methods and efforts of the local governments in charge of it.

### [Instructional Achievements]

Four graduate students have enrolled in the program over the past four years (including three working graduate students and one international student). We also conduct joint research with graduate students in other fields within the university.

Because we approach the prevention of dental diseases and oral dysfunction from both epidemiological and basic research perspectives, the research topics we supervise are diverse. Whatever the research theme, we guide the interests of our graduate students in their field of specialization.

### [Publication in 2023-2024]

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