表１　喪失歯数群別の推定栄養素摂取量平均値（１日あたり、n = 19,371）[a]

栄養素	喪失歯数				Trend p
	0-4 (n = 15,797)	5-14 (n = 2,196)	15-24 (n = 667)	25-28 (n = 711)	
蛋白質 (g)	73.6	72.4	72.3	71.6	< 0.001
脂質 (g)	55.5	54.6	53.9	53.5	< 0.001
炭水化物 (g)	255.8	257.0	259.5	266.2	< 0.001
カルシウム (mg)	604	585	581	565	< 0.001
鉄 (mg)	10.6	10.3	10.1	10.2	< 0.001
カリウム (mg)	2,955	2,940	2,921	2,838	0.009
ビタミンA (IU)	2,887	2,803	2,705	2,634	< 0.001
レチノール (μg)	431	430	418	412	0.21
カロテン (μg)	2,549	2,406	2,300	2,212	< 0.001
ビタミンC (mg)	143	137	133	127	< 0.001
ビタミンE (mg)	8.78	8.58	8.39	8.30	< 0.001
食物繊維 (g)	14.4	14.0	13.6	13.7	< 0.001

a)共分散分析により、性・年齢・喫煙習慣・エネルギー摂取量を調整

表２　喪失歯数群別の死亡率比（n = 20,959）

	喪失歯数			Trend p
	0-4	5-14	15-28	
n	16,954	2,423	1,582	
観察人年	41,611	5,673	3,740	
死亡者数	88	62	102	
死亡率比1[a]	1.00	1.62	1.80	0.002
(95%信頼区間)		(1.13-2.32)	(1.25-2.60)	
死亡率比2[b]	1.00	1.64	1.70	0.010
(95%信頼区間)		(1.13-2.40)	(1.14-2.52)	
死亡率比3[c]	1.00	1.66	1.70	0.012
(95%信頼区間)		(1.12-2.44)	(1.13-2.56)	

a)性・年齢を調整

b)性・年齢・喫煙習慣・飲酒習慣・BMI・精神的健康度・激しい運動・睡眠時間を調整

c)性・年齢・喫煙習慣・飲酒習慣・BMI・精神的健康度・激しい運動・睡眠時間・糖尿病既往・高脂血症既往・収縮期血圧を調整

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研究成果の刊行に関する一覧表

書籍

著者氏名	論文タイトル名	書籍全体の編集者名	書　籍　名	出版社名	出版地	出版年	ページ
WHO	Report of a meeting convened at the WHO Centre for Health Development in Kobe, Japan, 1-3 June 2005	WHO	Oral Health Ageing Societies	Oral Health in Ageing Societies	Geneva,	2006.	1-54

雑誌

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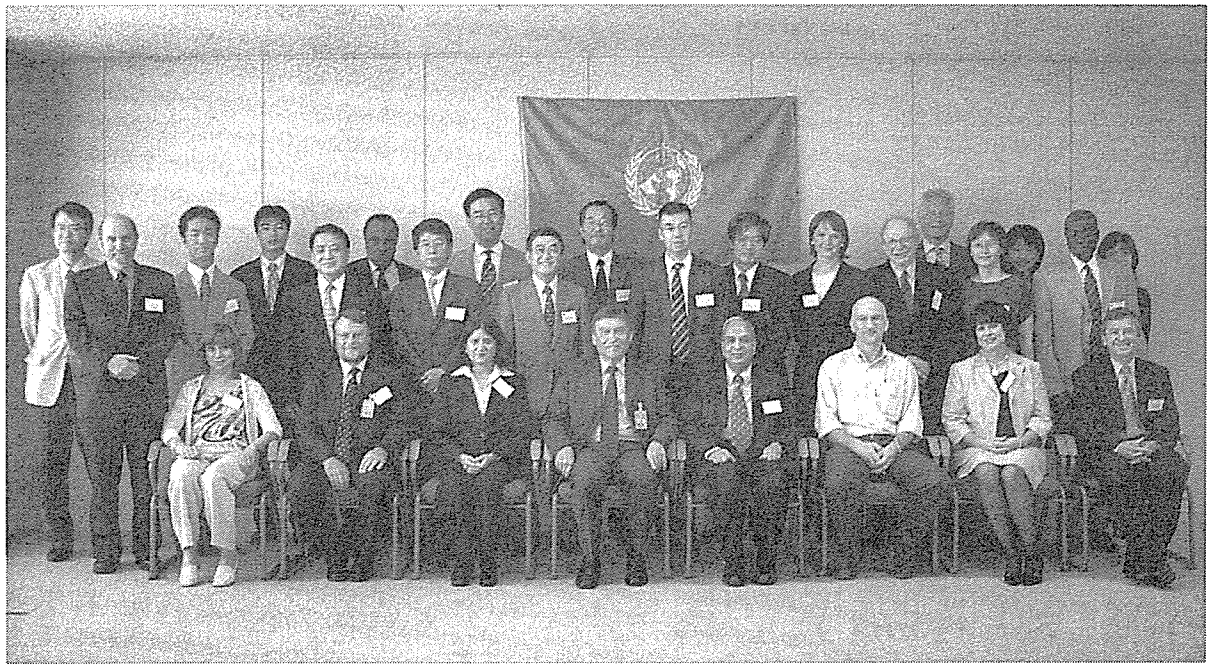
ORAL HEALTH IN AGEING SOCIETIES

INTEGRATION OF ORAL HEALTH AND GENERAL HEALTH

Report of a meeting convened at the WHO Centre for Health Development in Kobe, Japan, 1–3 June 2005

World Health Organization

Geneva
2006



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The texts by named authors in this publication are based on their presentations at the meeting on Oral Health in Ageing Societies: Integration of Oral Health and General Health, held from 1 to 3 June 2005, in Kobe, Japan. The named authors alone are responsible for the views expressed in this publication and they do not necessarily represent the decisions, policy or views of the World Health Organization.

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CONTENTS

Report prepared by **Dr Poul Erik Petersen**, Oral Health Programme, World Health Organization, Geneva, Switzerland, and **Dr Hiroshi Ueda**, Ageing and Health Programme, WHO Centre for Health Development, Kobe, Japan.

EXECUTIVE SUMMARY

Global population ageing is expected to continue in the 21st century, and maintaining maximum individual and population health throughout the lifespan is thus a significant challenge. Oral health is an essential element of general health and quality of life through an individual's life-course - yet one that is often neglected in integrated approaches for the promotion of general health.

Effective information-sharing between oral health professionals and other health care disciplines is critical for efficient health care and public health. The Ageing and Health Programme (AHP) of the WHO Centre for Health Development, Kobe, Japan, in collaboration with the Oral Health Programme (ORH) at WHO Headquarters, is focusing its research on oral health in ageing societies. Working with ORH and other relevant international bodies, AHP organized a meeting to raise awareness of oral health as an essential factor in general health and to bridge the gap between oral health and other important research and policy areas for individual health and community health.

The objectives of the meeting were to discuss preliminary outcomes of the global state-of-the-science research on the relationship between oral health and general health from a population ageing perspective; to identify appropriate comprehensive and integrated approaches and practices through health policy for better health care based on a multidisciplinary point of view; to assess the feasibility of integrated oral health strategies for development of best practice models through evidence of current practices; to discuss proper oral health policy formulation and common risk factor approaches in oral health promotion and disease prevention in ageing societies with a view to continuous development of a global database; and to promote and re-emphasize the importance of oral health as a component of overall health.

The meeting was held in the WHO Centre for Health Development from 1 to 3 June 2005. Thirty invited participants from twelve WHO Member States, in addition to representatives from the WHO Secretariat, shared information through presentations and intensive discussion during the meeting. **Dr Kreisel**, Director of the Kobe Centre, welcomed all participants in his opening remarks and briefly introduced the Centre's activities with a special focus on oral health in ageing societies. **Dr Petersen** outlined the objectives of the meeting and presented WHO global strategies and approaches for improving the oral health of older people. Following the introductory presentation on global ageing and the core exposé of the relationship between oral health and general health status in ageing societies, 17 presentations covered a variety of multidisciplinary approaches. Discussions followed each session, and overall issues and recommendations were debated on the last day.

Research on oral health–general health relationships has grown considerably over the past decade. The following conclusions and recommendations emerged from the presentations and discussions and from the background documents:

- The available scientific evidence is particularly strong for a direct relationship between diabetes and periodontal disease and also suggestive of a relation between periodontal disease and diabetes control.
- The evidence of a direct relationship between periodontal disease and cardiovascular diseases and between periodontal disease and respiratory diseases is less convincing. Evidence is limited by the lack of consistency and by the fact that most studies have used a cross-sectional rather than a longitudinal design or have inadequate control for confounding factors. Appropriate analysis with adequate adjustment for age, tobacco use, and other factors suggests that observed associations between periodontitis and cardiovascular disease could be coincidental rather than causal.
- The impact of xerostomia - dry mouth - on health of the oral cavity has significant biological plausibility. One problem lies in distinguishing the effects of medications on dry mouth from those of the underlying health condition. There is sound evidence that dry mouth negatively affects oral function and quality of life.
- Biological and behavioural factors are implicated in the complex two-way relationships between inadequate nutrition and weight loss on the one hand and poor oral health status on the other. Diet and nutrition in old age are affected by changes in the immune system, by tooth loss and the status of the oral cavity, and by environmental factors. The evidence is strong that medications can provoke malabsorption of vitamins and minerals essential for health.
- Psychosocial factors and common risk factors may be involved in the association between poor mental health and visual impairment and poor oral health.
- Men and women may need to be examined separately since biophysiological change and experience may be sex-specific.

Meeting participants considered several recommendations for action towards improved oral health and general health in relation to:

- policy development for oral health and general health;
- health systems capacity-building;
- oral health care delivery;
- research for oral health, general health, and quality of life.

The meeting emphasized the importance of strengthening advocacy for action, legislation, goal-setting, and planning of programmes for better oral and general health in old age.

The participants expressed concern about the limited primary health facilities and access to oral health services in most developing countries. They recommended strongly that oral health systems in all countries be effectively oriented towards disease prevention and health promotion and that systems better match the needs of older people, including the functionally independent, the frail and the functionally dependent. They also emphasized the need for training of health professionals for better service and care, based on multidisciplinary and holistic approaches, and pointed out the instrumental role of caregivers globally in promoting the health of older people.

On the basis of their experience, meeting participants indicated that strengthening of good-quality research into oral health–general health relationships is needed. Translation of knowledge into clinical and public health practice is particularly important as poor and disadvantaged population groups worldwide have yet to benefit fully from advances in health sciences – a statement that is particularly true of the oral health of older people in most countries.

1. BACKGROUND

Demographic transition has been observed worldwide, with a strong trend toward global population ageing. According to the United Nations Population Division, average global life expectancy at birth for both sexes is expected to increase by approximately 5 years to almost 70 within the next 25 years (UNPD, 2003). The global population is expected to grow from the current 6 billion-plus to 8 billion by 2025. Of those 8 billion people, the proportion living in developing and least developed countries is expected to reach 69.2% and 14.4% respectively; that is, an estimated 83.6% of the world's population will be living in developing countries (UNPD, 2003).

The burden of diseases and the risk profiles prevailing among populations are also changing dramatically. Like developed countries, many developing countries are experiencing epidemiological transition, characterized by a shift from infectious to noncommunicable chronic diseases (WHO, 2002a, 2005a). Although malnutrition and infectious diseases such as malaria and cholera are still common in some developing countries, these are now accompanied by noncommunicable diseases such as cardiovascular disease, cancer, diabetes, and depression – the so-called "double burden" of disease (WHO, 2002a). Unfortunately, many countries have failed to keep pace with these demographic and epidemiological changes and are not prepared for the expected future scenarios. As a result, current public health policies and community services may not meet the health care needs of older adults.

Given the expectation of continuing global population ageing in this century, maintaining maximum individual and population health throughout the lifespan is a significant challenge. Oral health – despite being integral to the individual's general health and quality of life – is often neglected in comprehensive approaches to the promotion of general health. Indeed, oral health care is often considered in isolation by national health authorities.

Effective information-sharing between oral health and other health professionals is most important for efficient health care and public health. The availability of international comparative data is instrumental to oral health surveillance. In close collaboration with the Oral Health Programme (ORH) at WHO Headquarters, the Ageing and Health Programme (AHP) of the WHO Centre for Health Development (WHO Kobe Centre, WKC) therefore planned oral health research and related activities, with special reference to older and ageing populations. The aims were to raise awareness of oral health as an essential factor in general health, to bridge the gap between oral health and other important areas, research and policy, to stimulate the development of proper community practices, and to facilitate comprehensive research and the collection of systematic oral health information.

Oral Health Programme at WHO Headquarters

The World Oral Health Report 2003 (Petersen, 2003a) outlines the global burden of oral disease and the principles for disease control and health promotion in the 21st century, laying particular emphasis on the following points:

- Oral health is integral and essential to general health.
- Oral health is a determinant factor for quality of life.
- Oral health and general health are strongly associated.

A number of common risk factors such as poor dietary practices, tobacco use, and excessive alcohol intake are primarily responsible for the interrelationship between several oral diseases and noncommunicable chronic diseases. The link between oral health and general health is particularly pronounced in older people. Improving the oral health of older people is an important component of the WHO ORH Global Strategy; approaches to this goal are detailed in a recent publication (Petersen & Yamamoto, 2005).

Globally, important mechanisms for improving oral health would involve strengthening oral health policy development; national capacity-building within oral health care for the underserved; education and training for service and care for the elderly; and research into the oral health of older people. However, the challenges vary from country to country and from region to region: the differences are particularly marked between developed and developing countries. In a number of countries, ORH has initiated demonstration projects for older people in order to gain experience within oral disease control, prevention of chronic noncommunicable diseases, health promotion, and quality of life improvement.

ORH provides analysis-for-policy and analysis-of-policy information that is fundamental to the integration of oral health into national and community health programmes. Initiatives include state-of-the-science analysis of the interrelationships between oral and general health, and the establishment of global data banks for surveillance of risk factors common to oral and general health. The Programme will implement the strategies for better health through oral health of older people in collaboration with various partners, including WKC.

WKC approaches to ageing and oral health issues

WKC views ageing as a lifelong process that begins at the time of conception and convened its first international meeting under the title "Ageing and health: a global challenge for the 21st century" in Kobe in November 1998. Deliberations at that meeting made an important contribution to the discussions of the United Nations International Year of Older Persons in 1999. At the second United Nations World Assembly on Ageing (WAA2), held in 2002 in Madrid, Spain, WKC and other WHO offices were leading contributors; the WHO document for the Assembly, Health and ageing, presented a policy framework based on a life-course perspective and a determinants of health approach. WKC contributed to the formulation of the WAA2 outcome document, International Strategy for Action on Ageing, by organizing the Valencia Forum ahead of the Assembly.

WKC regards oral and dental health as a vital element of general health status and is paying particular attention to increasing public awareness and responding to the demand for information on healthy ageing and longevity. Focusing on well-being and quality of life, WKC is working in collaboration with civil society groups and local communities in Japan. For instance, with the accent on oral health, the International Symposium on Good Oral Health in Ageing Societies: Filling the Gap between Dental Health and Life Expectancy was co-organized with the Japan Dental Association and brought some 200 dental and other health professionals together in Tokyo on 2 June 2001. The symposium was intended to promote awareness and provide information on advanced technologies and new knowledge with regard to the prevention, treatment, and service aspects of oral health throughout life (WHO, 2002b).

A second symposium on Good Oral Health in Ageing Societies: to Keep Healthy Teeth for Your Healthy Life – was held in Kobe on 10 November 2001 in collaboration with the dental associations of Hyogo and Kobe (WHO, 2002c). Inviting around 500 members of the general public to attend, WKC's aim was again to promote awareness and to facilitate better policy-making with regard to oral health in ageing societies.

In an attempt to collate a wealth of scattered information, the Global review on oral health in ageing societies was published as a technical report in 2002 (WHO, 2002d).

It is vital to emphasize systematic approaches to oral health and general health improvement in an ageing society. Holistic or comprehensive health approaches are needed and guidelines must be set on development of oral health systems for an ageing society. Capacity-building based on both the life-course perspective and quality of life will help countries and communities to respond more effectively to the current and future burden of oral disease through adequate public policies.

With these important concerns in mind, WKC convened a meeting on Oral Health in Ageing Societies: Integration of Oral Health and General Health from 1 to 3 June 2005. Thirty health professionals from twelve WHO Member States across all WHO regions were invited, in addition to representatives from the WHO Secretariat. The aims and objectives of the meeting were the following:

- To discuss the preliminary outcomes of global state-of-the-science research on the relationship between oral health and general health from the perspective of an ageing population.

- To identify appropriate comprehensive and integrated approaches to health improvement through public health initiatives, based on multidisciplinary actions.

- To assess the feasibility of integrated oral health strategies for development of best-practice models based on evidence and experience from different WHO Member States.

- To discuss the proper formulation of oral health policy and common risk factor approaches in oral health promotion and disease prevention in ageing societies.

- To discuss the continuous development of a global database for surveillance of oral health and risk factors.

- To promote and re-emphasize oral health as a critical component of holistic health.

- To produce a summary report of the meeting to be distributed to all participants, public health administrators, decision-makers, and other relevant groups in policy development for better health.

2. SUMMARY OF OPENING SESSION AND PRESENTATIONS

In his opening remarks, **Dr Wilfried Kreisel**, Director, WKC, emphasized the importance of oral health in ageing societies. He stated that one of the key changes would be to improve response to local concerns and needs by using international knowledge and experience and to delineate local and national findings for global application. Presentations and discussions were expected to stress systematic, integrated approaches to oral and general health in ageing societies while bridging the gap between research and policy from life-course and quality-of-life perspectives.

After an overview of meeting objectives by **Dr Poul Erik Petersen and Dr Hiroshi Ueda**, all participants briefly introduced themselves. Chairpersons and rapporteurs were elected and the meeting agenda was adopted.

Dr Gary Andrews presented the profile of global ageing – challenges to health – from a multidisciplinary point of view. After reviewing research issues and information imperatives for health and well-being in an ageing world, he pointed out that a limited number of overarching themes could be identified through examination of the major priority areas in ageing. Dr Andrews emphasized that information gathering and research are fundamental to countries' formulation of comprehensive responses to worldwide population ageing.

Drs Petersen and Ueda then outlined WHO's global strategies and approaches for improving the oral health of older people. They emphasized the global burden of oral disease in older people and common risk factors for oral diseases and noncommunicable chronic diseases. They pointed out that common risk factors may lead to relationships between oral and general health in terms of cause and effect and co-morbidity; however, for certain health conditions, interrelationships at biomedical level are still unclear. Common risk factor approaches in the promotion of oral health and disease prevention were presented, and Dr Petersen outlined the overall WHO policies and strategies for oral health with special focus on the ageing society, which are based on the available evidence of global trends in oral health and on available oral disease data.

In a keynote address, **Dr Daniel Kandelman** presented a state-of-the-science account of the relationship between oral health and general health status in ageing societies. Examining what is known and not known and looking at possible cause–effect relationships through a systematic literature review, his presentation provided an overview of the impact of oral health on general health – and of general health on oral health. His analysis, too, was given from the perspectives of life-course and quality of life. Concluding his presentation, Dr Kandelman stressed the importance of translating knowledge into solutions.

Following the keynote address, country case reports were presented, providing an exchange of experience and introducing a range of different approaches to oral health improvement. **Dr Nobuhiro Hanada** recounted the history of national health promotion in Japan, with a focus on oral health at different stages of life. He made particular mention of the 8020 Campaign, the objective of which is for all adults to keep 20 natural teeth until age 80; it was introduced by the Japanese Ministry of Health, Labour and Welfare in 1989. Emphasizing the importance of oral health in ageing societies, Dr Hanada noted that the Japanese National Survey of Dental Diseases has been conducted every six years since 1957.

One of the best-known studies in Japan – the Niigata Elderly Health Study, which is targeting a sample of 70- and 80-year-olds – was introduced by **Dr Hideo Miyazaki**. The study is based on a longitudinal survey scheme operating from 1998 to 2008. In addition to outlining programme outcome, Dr Miyazaki illustrated diagrammatically the relationships between oral health conditions, disease measures, health behaviours, general health conditions, and quality of life.

Dr Kenji Wakai then outlined the LEMONADE Study, a longitudinal study among dentists in Japan that examines the associations between oral health and incidence and/or mortality of serious chronic diseases from a medical point of view. With support from many bodies in addition to the Ministry of Health, Labour and Welfare, the study will follow up participants for 5–10 years. The study comprises a large sample and a variety of risk and health indicators, and outcomes will be available soon.

The status of community oral health care for the elderly in China was introduced by **Dr Ling Zhu**. She explained the different roles of private dental care and community dental services and described the challenge of providing appropriate services for the elderly. Dr Zhu emphasized the relevance of primary health care and prevention-based approaches in community health care. An important recommendation was to provide health education to the elderly and to improve the quality of health care providers with government support.

Next, **Dr Hari Parkash** presented an overview of oral health issues among elderly populations in India. He stressed the vulnerable health and social situations of these populations, notwithstanding the respect in which they traditionally held, pointing out that India expects a rapidly growing proportion of older people. Highlighting the barriers to providing oral health care among the elderly, Dr Parkash stated the importance of strengthening the involvement of government, institutions and nongovernmental organizations.

Dr Helen Whelton informed delegates of the focus on integrated oral health care for the elderly in Ireland. She pointed out the poorer oral health-related quality of life of older people compared with younger and of the less well-off compared with others. Her recommendations included integrating oral health care with other services accessed regularly by the elderly, adoption of a common risk factor approach, prevention of oral diseases in the early stages of life, and participation by dentists in primary health care teams.

In an extensive review of the oral health situation in the Eastern Mediterranean Region and with a special focus on oral health status among the elderly in Jordan, **Dr Lamis Rajab** observed the general lack

of epidemiological data and information about oral health systems in relation to the elderly among the countries of the Region. Existing data indicate that poor oral health appears to be a major public health problem among older people. In Dr Rajab's opinion, the undergraduate dental curriculum should include essential aspects of geriatric dentistry and information about the oral health–general health relationship.

Dr Enosakhare S. Akpata described oral health issues among the elderly in Nigeria. He reported that, in principle, oral health policy in Nigeria integrates oral health care with general health using primary health care and multisectoral approaches, but that there are significant constraints to implementation of the policy. Dr Akpata ended his presentation by calling for more research into the growing burden of poor oral health and the links between oral health and general health among the elderly.

Dr Ronald Ettinger introduced the example of integrated multidisciplinary teaching/service in geriatric dentistry in the United States of America. He outlined a university programme with a health promotional component, a concept that might be applied universally to dental schools. He focused on the changing perceptions of oral health and how it relates to general health and quality of life, replication of effective evidence-based training programmes, increasing the size and capacity of the workforce, and the need for collaboration between oral health professionals, health care providers, and others.

Several meeting participants emphasized multidisciplinary approaches in connection with oral health in ageing societies. **Dr Cyril Enwonwu** identified nutritional characteristics and associated medical and biophysical factors as essential dimensions of oral health in the elderly. He pointed out the poor health conditions – loss of teeth, low nutritional status, and communicable and noncommunicable diseases – that prevail among the elderly in poor countries.

In her presentation, **Dr Anne Pak-Poy** emphasized that oral health among the elderly is fundamental to quality of life throughout the life-course. Programmes aimed at improving the oral health of the elderly should consider quality-of-life assessment as part of short- and long-term strategies and for building community and health workforce capacity. Dr Pak-Poy also introduced two demonstration programmes in South Australia that identify life-course checkpoints for older people both living in the community and in residential care. Development of an oral health assessment tool for medical general practitioners to use in residential aged care facilities was discussed.

Dr Murray Thomson talked of inequity in health. He pointed out that the association between social position, oral health, and general health may vary during the life-course and that it may not be possible to capture the extent of inequity by measuring a single variable. From a systematic literature search, Dr Thomson found that information on inequity was scarce in many countries and parts of the world and also that most countries had not examined or reported on the relationship between oral and general health among the elderly. Countries that had examined this relationship reported social inequalities in oral health among older people and proposed public health solutions for better health for all ages.

Dr Ok-Ryun Moon discussed promotion of oral health for the elderly from the perspective of community health care. Pointing out that oral health tends to have a low priority in public health and that there is little

recognition of the fact that oral health is integral and essential to human well-being, he emphasized the importance of comprehensive community health care approaches. Dr Moon advocated the implementation of such programmes for oral health among the elderly and demanded evaluation studies on the effectiveness of community oral health programmes in reducing risk factors and improving general health.

Dr Jos van den Heuvel's presentation focused on the feasibility of comprehensive and integrated oral health approaches in different ageing societies and the challenges involved in identifying target groups of older people. Dr Van den Heuvel conveyed the recommendations of the Council of European Chief Dental Officers, particularly on integrated oral health care for institutionalized populations, and alluded to oral health expenditures in European countries.

Dr Poul Erik Petersen and Dr Hiroshi Ogawa reviewed the use of indicators for surveillance of oral health and risk factors in ageing societies. WHO has developed and monitors a comprehensive Global Oral Health Database. The presenters discussed the importance of WHO's Oral health surveys: basic methods manual (WHO, 1997) for assessing the oral health status of population groups and the significance of oral health information systems for intercountry comparisons and national surveillance (Petersen et al., 2005). In recent years, integrated databases linking oral health to databases for chronic diseases and common risk factors have been developed, including tools for data collection (STEPS) within the frame of the WHO Global InfoBase (Petersen et al., 2005). Drs Petersen and Ogawa predicted that, by incorporating information on risk factors, a revision of WHO's Oral health surveys: basic methods would assist the development of oral health systems that will strengthen control of determinants of health and reduce disparities in oral health between different socioeconomic groups within countries and inequalities across countries. Integrated oral health and general health surveillance will help policy-makers and public health administrators to build effective national and community health programmes, including programmes for older people. In addition, Drs Petersen and Ogawa outlined the importance of the International Collaborative Studies (ICSs), which may help to assess the effectiveness of oral health systems and the role of sociobehavioural factors in oral health (Chen et al., 1997; Petersen, 2005a).

The presentation given by **Dr Kaumudi Joshipura** covered a variety of policy issues in relation to the gaps in research on interrelationships between oral and general health, clinical and public health practices including health promotion, prevention and educational programmes, translation of knowledge and technology transfer to less developed areas, financing of oral health care, and multidisciplinary approaches for integrated health care. Areas where these gaps might be reduced were identified, including the role of oral health professions in improving nutrition, which might reduce the incidence of certain noncommunicable diseases. Several challenges in capacity-building for oral health improvement in older people were also presented for further consideration.

With medical expenditure in oral health as his research focus, **Dr Mitsugu Kanda** introduced the Hyogo 8020 Survey – the result of collaborative work with WKC – and its outcomes. The survey includes residents of 70 years and over who visited both a dental clinic and a medical facility in Hyogo Prefecture, Japan, including more than 30 000 residents with more

than 70 000 medical claims. From national medical insurance claims and information on the number of remaining teeth, the Hyogo Dental Association found – as expected – that medical expenditure was highest for the group with fewest remaining teeth. They also found some disease-based relationships between the number of remaining teeth and medical expenditure among the elderly.

3. DISCUSSION

This section outlines observations that were based on background documents for the meeting, on the individual papers presented by the participants, and on the plenary discussions.

A worldwide demographic transition is taking place as the proportion of older people in the population grows faster than that of any other age group. This poses tremendous challenges to health and social policy planners, particularly because disease patterns will shift concurrently with the demographic change. Chronic diseases such as cardiovascular disease, hypertension, cancer, and diabetes are especially prevalent in old age and may have a significant impact on quality of life. Moreover, the burden of oral disease is high in older adults. Globally, poor oral health among older people is primarily seen in high levels of tooth loss, dental caries, prevalence of periodontal disease, xerostomia (dry mouth), and oral precancer/cancer – conditions that have a major bearing on quality of life. Several oral health conditions are associated with chronic diseases, and the links between oral health, general health, and quality of life are pronounced in old age.

Research on the links between oral health and general health has focused primarily on the following associations:

General health	Oral health
Mental diseases, including dementia and Parkinson disease	■ High levels of caries experience ■ Tooth loss ■ Periodontal disease/impaired or neglected oral hygiene ■ Experience of pain ■ Chewing difficulties ■ Poor function of dentures
Visual impairment	■ Dental caries ■ Gingival bleeding ■ Reduced ability to maintain oral health
Xerostomia related to systemic disease, head and neck radiations, or multiple/regular use of medications	■ Dental caries/root caries ■ Candidosis ■ Impaired mastication, swallowing and speech
Inadequate nutrition (impaired immune response)	■ Periodontal disease ■ Tooth loss ■ Poor oral hygiene ■ Masticating function and swallowing ■ Taste perception ■ Oral dryness ■ Oral pain ■ Oral cancer
Weight loss	■ Edentulousness