Dental Care for Aging Populations in Denmark, Sweden, Norway, United Kingdom, and Germany

Poul Holm-Pedersen, D.D.S., Dr. Odont.; Merete Vigild, D.D.S., Ph.D., Dr. Odont.; Ina Nitschke, D.D.S., M.P.H.; Douglas B. Berkey, D.M.D., M.P.H., M.S.

Abstract: This article reviews access to and financing of dental care for aging populations in selected nations in Europe. Old age per se does not seem to be a major factor in determining the use of dental services. Dentition status, on the other hand, is a major determinant of dental attendance. In addition to perceived need, a variety of social and behavioral factors as well as general health factors have been identified as determinants of dental service use. Frail and functionally dependent elderly have special difficulties in accessing dental care; private dental practitioners are hesitant to provide dental care to these patients. One reason may be that the fee for treating these patients is too low, considering high dental office expenses. Another reason may be problems related to management of medically compromised patients. This raises an important question: does inadequate training in geriatric dentistry discourage dentists from seeking opportunities to treat geriatric patients? Overall, the availability of dental services, the organization of the dental health care delivery system, and price subsidy for dental treatment are important factors influencing access to dental care among older people in Europe as well as in the United States.

Dr. Holm-Pedersen is Professor and Director, Copenhagen Gerontological Oral Health Research Center, University of Copenhagen, School of Dentistry, Copenhagen, Denmark; Dr. Vigild is Director, School of Oral Health Care, University of Copenhagen, Copenhagen, Denmark; Dr. Nitschke is a senior faculty member in the Department of Prosthetic Dentistry and Dental Materials, University of Leipzig, Germany; and Dr. Berkey is Professor, Department of Applied Dentistry, University of Colorado School of Dentistry, and Dental Director, Total Longterm Care, Denver, Colorado, U.S.A. Direct correspondence and requests for reprints to Dr. Poul Holm-Pedersen, Professor and Director, Copenhagen Gerontological Oral Health Research Center, School of Dentistry, University of Copenhagen, Norre Alle 20, DK-2200, Copenhagen N, Denmark; 011-45-3532-6600 phone; 011-45-3532-6602 fax; php@odont.ku.dk.

Oral health and dental service use among older persons have improved dramatically in most industrialized countries during recent decades, yet there are still marked disparities in oral health status and access to care. During the past century, there has also been a notable increase in both the number and proportions of older persons over the age of sixty-five years, with those over eighty years showing the most marked increase.[1] Because these demographic changes in Europe are slightly ahead of those in the United States, lessons learned in western Europe may be useful for examination of these same trends in the United States. The purpose of this article is to examine utilization and financing of dental services by elders in selected western European countries and compare them with those in the United States.

Aging and Utilization of Dental Services in Europe

More Europeans are surviving into old age. The growth in the number of elderly persons results from improvements in both social living conditions and medical care and is determined by the size of the different birth cohorts from which the elderly populations are derived. This development has also contributed to a perceptible gain in life expectancy, even after the age of sixty-five years. However, the gain in life expectancy includes both active and dependent years.[2] The concept "compression of morbidity" argues that better access to health care and healthier lifestyles in the younger years will result in postponing the period of chronic diseases and dependence to advanced age and that the period with disability will be compressed. Conversely, the concept "extension of morbidity" claims that increased survival will result in a longer period with disability at the end of life. It has been suggested that we, in fact, may be witnessing a greater polarization, where one part of the elderly population is getting healthier, while another part is getting more disabled and ill,[2] because, due to medical advances, more people are surviving with chronic diseases and disabilities that would have been fatal in the past. The longer people live, the more their mobility and/or capacity for self-care often become reduced by physical or mental dis-

ability and other chronic diseases, accompanied by more limited access to mainstream dental services.[3]

For the purposes of this article, the term "access" has been defined as a population's potential entry to the health care system, whereas "use of dental services" refers to realized access.[4] Dental service use has been further defined by the following parameters: 1) annual number of dental visits per person, 2) proportion of persons visiting a dentist within a year, 3) reported first dental visit in a series of visits, 4) lack of dental visits within a specific period of time, 5) aggregated expenditures for dental visits, and 6) routine vs. emergency care.[5,6]

In principle, four different models of dental needs[7,8] have been suggested:

- professionally defined need (the so-called normative need)
- perceived need
- expressed demand
- "realistic need."

Each definition can be divided into need for preventive services and need for restorative services. There is a huge discrepancy between the outcome measures of the different assessments of need for any given individual; these differences may be more significantly demonstrated among frail and institutionalized populations.

Needs associated with oral health cannot be met without rethinking concepts that define oral health and quality of life.[9] It is often difficult for oral health care providers to consider offering and/or providing treatment options considered less than optimal under normal circumstances. The professionally assessed need for dental treatment, based solely on clinical diagnosis, often leads to an overestimation of the true need for treatment, especially among frail and functionally dependent elderly people, some of whom do not want treatment, either because there is no perceived need or no expressed demand. Others are very ill and some in such poor mental condition that they cannot express any demand for treatment and might not benefit from treatment such as new dentures. Thus, the "realistic" or "feasible" need is an attempt to assess the "true" need for treatment in relation to the benefit provided.[8] It is a combination of the professionally assessed need, the self-perceived need, and the expressed demand and takes into account the mental and physical state of the patient as well as ethical considerations. The establishment of outreaching preventive and restorative oral health services for these subgroups of elderly people is dependent on the allocation of resources and, hence, is a political decision. Assessments based on the realistic treatment need, however, may create a meaningful basis for practical communication with political decision makers, institutional staff, and health planners.

The present review will be based mainly on studies conducted in Denmark, Sweden, Norway, the United Kingdom, and Germany and, where appropriate, compared to findings of studies from the United States.

Frequency of Utilization

In Sweden, a recent retrospective study of adults over the age of eighty, using many past years of patient records gathered from general dental practitioners, found that 66 percent of the dentate individuals made regular dental visits every or every other year in the 1990s.[10] On average, 3.3 visits were made per treatment period. A small fraction (10 percent) had records with a great number of emergency visits. The findings of this study regarding regular dental attendance are of the same general magnitude or slightly lower than those reported in other studies of similarly aged, dentate older adults living in Sweden.[11,12]

In a study of individuals aged seventy-nine and eighty-eight years living in Northern Sweden, Nordström et al.[13] found that only one-fourth of these elderly had visited a dentist at least once per year during 1981-90. Their sample, however, included edentulous people as well, which, in part, may account for lower utilization rates. A study using insurance claims from public and private dental clinics during a three-year period (1990-92) found that visits to the dentist decreased with age.[14] Many received emergency treatment at some time during the observation period, but the majority had regular dental care habits, defined as having received complete dental care at least two of the three years.

A recent study compared the utilization of dental services between Swedish citizens and Danish citizens aged sixty to sixty-nine.[6] After controlling for gender, dental status, and income, more than 80 percent had visited a dentist in the preceding twelve months. However, 77 percent of the Danes reported dental visits twice a year compared to 28 percent of the Swedes. Although the Danes made more frequent use of dental services, they had poorer dental conditions than the Swedes. These findings suggest that higher utilization does not necessarily lead to better oral health. According to the authors, the amount of dental treatment per visit, the different dental insur-

ance systems, and, in particular, the different organization of the dental health care delivery system in these two countries are major factors underlying this discrepancy.

In the United Kingdom, McGrath et al.[15] reported that nearly 50 percent of older people claimed that they visited a dentist within the past year, while 10 percent claimed that the reason for their last visit was an emergency. Forty-three percent were classified as regular attendees, defined as having visited the dentist within the last year for a non-emergency.

As an indicator of service use, Nitschke et al.[16] compared the accuracy of self-reported time since last dental visit with the actual dental records in a sample of German elders aged seventy to 103 years. Only 13 percent remembered correctly when they had last seen a dentist (less than a thirty-day variance), another 55 percent were mistaken by one to six months, and the remainder by more than six months. Self-reported time since last dental visit varied from two weeks to fifty-two years. This study confirms that research using a self-reporting technique may find higher dental care consumption than research using more objective insurance claim registration or dental records as a data source, leading to an overestimate of actual consumption. Among older adult age groups, this recall bias may be more prevalent and pronounced than in younger cohorts.

Determinants of Utilization

Many factors have been identified as possible mitigating determinants of utilization rates among elderly people (Figure 1) and may also interact in a complex fashion with each other and with other factors, particularly attitudinal factors. A few key determinants are discussed below.

Community-Dwelling Elderly. Old age by itself does not seem to be a major factor in determining the use of dental services when populations are stratified by dental status. Dentition status, on the other hand, has been described as a major determinant of dental attendance among older people. Several studies have shown that utilization of dental services is substantially higher among dentate older adults than among edentulous subjects.[16-20] Findings from the United Kingdom identified self-reported dental status as the most important predictor of utilization of dental services, having controlled for sociodemographic factors in the model.[15] A twofold

- Accessibility of the dental office
- Availability of dental services/number of dentists and dental hygienists
- Dental status (number of teeth, edentulism)
- Gender
- Personal characteristics of the individual
- Perceived oral health, symptoms (e.g., pain)
- Organization of the dental health care system (private, public, on-site)
- Income
- Cost of care
- Education
- Social background
- Geographical background
- Cultural background, ethnicity
- Social relations
- Lifestyle
- General health status, functional disability, cognitive decline, number of drugs used
- Dentist limitations

Figure 1. Determinants of utilization of dental services among elderly people

increase in dental service use was associated with the possession of twenty or more natural teeth, while a sixfold decrease was associated with possession of a full denture. A Swedish study found that, independent of each other, men, people with a few remaining teeth, and people with removable dentures had a significantly higher probability of dental care utilization of less than once per year.[21] Among people who reported a perceived need for dental care, those who cited cost as a barrier had a sixfold higher probability of using dental care less than once per year compared to those for whom cost was not a barrier. Similar findings have been reported by Österberg et al.[18] Suominen-Taipale et al.[19] found that household income together with number of teeth were major factors predicting dental attendance. In a recent national, community-based survey in Denmark, Petersen et al.[20] reported that regular dental attendance within the past five years was markedly lower among older adults with lower income levels.

Several investigators have reported that the main reason for infrequent dental service utilization was low perceived need,[12,22] whereas Suominen-Taipale et al.[19] found self-perceived need to be a minor predictor among older adults in Finland. The latter finding was based on a postal questionnaire that was subsequently checked by a nurse. In addition, a substantial proportion (41 percent) of the study participants reported being edentulous. It is plausible that lower rates of perceived need among edentulous persons, compared to dentate persons, may help explain this finding.

Other studies have found that the degree of significance that older people attach to specific symptoms, including general health symptoms, is an important factor for seeking care.[23] Most dental diseases are insidious and the early stages are often overlooked or ignored because the patients do not associate the typically nonsevere symptoms with initiation of a potentially serious dental/oral condition. Because the dental health care systems for independently living older adults are passive and rely on the patients to enter the system and initiate care, this lack of awareness may account for low utilization of dental care among some subgroups of older people.

Independent of dental status, the study by Lundgren et al.[12] revealed that factors such as loneliness, low level of education, and functional impairments were significantly associated with low demand for dental services. Several studies have found that education is associated with regular use of dental services.[16,18,20,24] It has been suggested that education reflects other important factors related to the use of dental services, such as knowledge, attitudes, and the value placed on oral health, factors that are known to be related both to education and use of services.[24,25] Further, education may serve as an indicator of socioeconomic position and may determine individual membership in certain societal subcultures, which have their own norms about health, not governed by individual knowledge.[26]

Österberg et al.,[27] in a study of seventy-five-year-old men, reported that self-assessed impaired general health, number of medications taken, and economic problems were significantly associated with irregularity of utilization of dental care, independent of number of teeth. In women, living alone and smoking tobacco were also significant factors. In a subsequent study based on interviews by Statistics of Sweden, Österberg et al.[18] found that the relative risk for not visiting a dentist within the last year, adjusted for age, gender, and dental status, was higher in dentate subjects with low income and education, not married, not native born, living in rural areas, smokers, and having low social and physical activity. The results of the logistic regression analysis showed that, among the elderly, functional ability and general health factors had lower significance for time since last visit to a dentist than socioeconomic factors, social relations, and lifestyle factors.

In Denmark, Petersen and Nørtov[28] studied the interrelation among oral health, lifestyle, and social network among sixty-seven-year-olds. Sixty percent of those with high scores on lifestyle activity (participation in a number of social and cultural activities) had regular dental visits compared to 31 percent of those with low activity. Regular dental attendance also was lower among elderly persons who had weak contacts with friends and were living alone.

A Danish longitudinal study of individuals aged seventy-five to eighty showed that community-dwelling persons with general functional limitations (mobility problems at both measurement times) sustained from age seventy-five to eighty had nearly double the risk of being nonusers of regular dental services at age eighty and that persons with deterioration in mobility had a 1.7 times higher risk of becoming nonusers.[29] In a subsequent study, Avlund et al.[30] found that independently living very old people with cognitive decline had a four times higher risk of not using dental services regularly than those with better cognitive function.

Institutionalized and Functionally Dependent Populations. Frail and functionally dependent elderly people, living in long-term care facilities or at home, have special difficulties in accessing dental care because the problems of attending a dental clinic often appear insurmountable. The accessibility of the dental office is important too, especially for functionally disabled older patients. To help overcome these barriers, onsite dental equipment may facilitate access in larger nursing homes, while mobile or portable dental equipment may be the appropriate method of choice for smaller care facilities and for older people living at home with similar health problems and lack of mobility.[31]

Fenwick et al.[32] studied the association between medical problems and dental treatment needs of old people referred to the National Health Service (NHS) Community Dental Service in the United Kingdom. General dental practitioners referred most of the patients, but some referrals came from physicians in long-term wards. The most prevalent medical problems among the referred patients were dementia, stroke, Parkinson's disease, and cardiovascular diseases. Several patients suffered from a clustering of concomitant chronic diseases and problems. A further complicating factor was lack of mobility: only 6 percent were mobile, and 19 percent were bedridden. In addition, 18 percent suffered kyphoscoliosis, which can present problems in correctly positioning the patient in the dental chair for treatment. Two-thirds of the sample had problems of mental confusion. Overall, most types of treatment procedures ultimately provided by NHS dentists were reported to be relatively simple. Over two-thirds were treated at home. The data indicated that, for the large majority, the treatments were well within the scope of a competent general dentist; further, likely reasons for referring these patients were not shortcomings in technical skills, but rather patient management issues in dealing with physical and/or cognitive disabilities. In addition, the cost and time involved for general dentists to provide care for these patients might be additional factors, especially for those patients for whom domiciliary (home) care was considered to be the appropriate method of dental care delivery.

This raises an important question as to whether undergraduate and/or postgraduate training programs in geriatric dentistry will help ameliorate dentists' reluctance to treat frail and functionally dependent patients due to perceived patient management problems. There are only recent data available on geriatric dental curricula in a few European countries: Germany, Austria, and Switzerland.[33] In addition, there is very limited information about the impact of teaching programs in geriatric dentistry on dental students' willingness to carry out dental care for these subgroups of old patients after graduation. A study from the United Kingdom reported that providing dental students with an experience with medically compromised elderly patients in a rehabilitation unit in a large hospital successfully improved the students' understanding of and attitudes towards elderly people.[34] According to the authors, the students learned to understand and appreciate that these patients had special needs as well as special abilities and that many patients did not know that they could obtain domiciliary dental care. Studies from the United States found that undergraduate dental school programs in geriatric dentistry enhanced dental students' confidence in dealing with geriatric patients.[35,36]

Thus, old age in itself does not seem to be a major factor in determining the use of dental services when populations are stratified by dentate status. The number of natural teeth has been described as a major determinant of dental attendance among older people. Consequently, the aim should be to identify groups of aging persons who are at risk and would benefit from treatment. Among elderly persons in the European countries, socioeconomic factors, social relations, general health status, physical and cognitive disabilities, and consequent problems with access to services seem to be important barriers to regular dental care. Thus, several factors—including the education of dentists—determine the extent to which oral health care is accessible to the elderly population.

Dental Health Care Delivery Systems in Several Countries

Tradition, politics, and values have all played a role in influencing the pattern by which oral health care services are financed and organized in different countries. However, the prevailing political and economic structure of a country does not alone determine the specific characteristics of the dental care delivery system.[37] In the Nordic countries, for example, oral health care is provided by a blend of public and private systems, partly financed by governments through general tax revenues and partly by out-of-pocket fees for service or private insurance.

Denmark

In Denmark, all nondependent, community-dwelling older adults can choose among private dental practitioners only. The most common preventive and restorative treatments are reimbursed up to approximately half of a fixed fee set by the national health insurance. Dentures, crowns, and bridges are paid totally by the patient or by a combination of out-of-pocket expense by the individual and private health insurance.

For the majority of nursing home residents and for the very disabled noninstitutionalized elderly, only episodic emergency care was available until 1994, when it became compulsory for the municipalities to provide systematic, outreach oral health care, almost free of charge, to frail, dependent elderly. In principle, these patients may choose treatment by private dental practitioners or by the public dental service. In reality, however, the majority of these patients are treated by the public dental service in most of the municipalities following the recommendations of the realistic treatment need. The counties also provide systematic oral health care programs on-site for elderly in long-term psychiatric care institutions.

Sweden

Able-bodied Swedish elderly can choose treatment from private dental practitioners or from the public dental service, which is administered by the counties. Treatment is not free of charge, but the national health insurance covers a certain amount of the expenses. Sweden introduced national dental health insurance in 1974 and, as a result, dental treatment was heavily subsidized until recently. The guiding principle was "high cost protection." This meant that the patient pays a relatively lower percentage of the fee for more extensive treatment interventions compared to routine services. The goal of this all-encompassing dental insurance was to make comprehensive dentistry available to all citizens regardless of income.

The national dental health insurance was changed in 1999, when a new method of financing dental care for institutionalized, ill, and functionally dependent patients was introduced. According to the new law, the counties are responsible for performing oral health assessments and for counseling of patients and nursing staff, as well as for providing "necessary" dental care, while the national dental health insurance is responsible for providing increased reimbursement of expenses for "necessary" treatment. Patients do have the option, however, to choose treatment by a private dental practitioner and pay a fixed fee per visit. These expenditures are added to expenses for general health care, including prescribed drugs, up a maximum of SEK 900 (equivalent to approximately US$120) within a twelve-month period. The costs for dental treatments exceeding this amount are paid in total by the national dental health insurance. Oral health assessments and counseling are free of charge. Many long-term care institutions have systematic on-site dental care units. The counties organize the oral health care services for elderly in a different manner.

Norway

In Norway, the national health insurance does not cover dental care for independent elderly patients; rather, patients have to pay the total costs of treatment out-of-pocket. Almost all treatment of healthy elderly patients is provided in private dental practices.

According to the Dental Service Act of 1983, Norwegian counties are responsible for the availability and accessibility of adequate dental care services to the entire population. In addition, the public dental services must provide free regular and outreach services to the following groups, listed according to priority:

- children up to eighteen years;
- mentally handicapped people;
- groups of elderly, institutionalized and homebound, sick and chronically ill and disabled people; and
- young adults eighteen to twenty-one years.

The county is responsible for planning and coordinating both public and private services. The county is required by law to prepare a dental health plan, which must be approved by the chief administrative body of the county and by the Department of Social Affairs. According to the Dental Service Act, frail and dependent elderly are included in the third priority group.

United Kingdom

In the United Kingdom, dental care for community-dwelling elderly patients is provided by the National Health Service (NHS) and by private dental practitioners. The NHS was established in 1948; subsequently, inexpensive oral health care became available to all residents.[38] At that time, extraction of teeth and their replacement with dentures were per-

ceived as an acceptable and perhaps even a preferable approach to treating substantial dental problems. The NHS is financed through public revenues. Dentists can choose to work for the NHS or in private practice or both. Currently, dentists who work for the NHS are paid a set amount per item of care as well as a small capitation fee for retaining an individual as a registered patient with their practice. Patients are required to pay a substantial portion of the costs of their care to the dentist, although relief from payment is available on the basis of financial hardship. The fee scale is determined by national negotiation between the British Dental Association and the UK's Department of Health, within a strict, government-imposed financial limit. This process has driven down the costs of care over the years and now covers treatment with the least expensive materials available only. It has been argued that this method of payment encourages replacement of restorations and other active work for patients rather than prevention and maintenance, as the latter are not rewarded by the system. In addition, a substantial number of dentists in the UK now feel that they cannot function as an economically viable practice in this system and are withdrawing from the NHS altogether, resulting in problems with access to care.

In 1999, the NHS treated 28.5 million patients, while around one million patients had private health insurance. On average, each dentist had 1,499 patients registered.[39] A survey of adult residents of a district of Buckinghamshire indicated a substantial unmet perceived treatment need, with more than one-third of this population preferring continuing NHS dental services but being unable to access them.[40] Another recent national survey has shown that the NHS treats over two-thirds of adults and less than one-third have private dental care.[41] The latter survey further showed that one in five adults experienced difficulties in finding an NHS dentist. This would suggest that many people are being forced to pay privately for dental care when they would prefer to obtain dental care through NHS means. Difficulty in obtaining an NHS dentist was associated with age (greater than sixty-five years), gender (men), social class (higher social class background), and area of residence (residents of the South of England [London, South East, South West] were more likely to report that they experienced difficulties in obtaining an NHS dentist compared with those living elsewhere in the UK). It is suggested that the latter finding may reflect the change in the workforce that has occurred in the South of England with a greater number of dentists providing dental care through independent and private modes. Moreover, the study showed that difficulty in obtaining NHS care was also associated with dental service-related factors (time since last dental visit, use of emergency dental services).

The NHS is undergoing a major revision of its working practices at present, with a change from the current fee per time of services to a capitation-based system. Under this new system, dentists are being employed (and paid a salary) by primary care trusts to provide care for a cohort of patients with local commissioning of services. These changes will be implemented in full by April 2006.

The Community Dental Service (CDS) will provide a safety net for dental care of frail and dependent elderly persons in the United Kingdom. However, these adult patients remain liable to meet the costs of treatment by the CDS on the nationally agreed scale of fees. The availability of this safety net is not uniform across the UK.

Germany

In Germany, dental care is provided by private practitioners and is embedded in the national social system.[42] Historically, the German system of health care was part of the national social policy as initiated by Bismarck in 1883. Today, the social insurance system has five columns: health insurance, pension insurance, promotion of employment, occupational accident insurance, and long-term care insurance. About 90 percent of all German citizens belong to the national insurance system. A fee paid in equal parts by the employer and the employee finances the health insurance system. Currently, the total legal health insurance fee is approximately 14 percent of the employee's gross income. At the start of the social health insurance system, no dental treatment was insured and, later, only extraction of diseased teeth and the manufacture of dentures were included. In the current dental health care system, extractions, apicoectomies, restorations with amalgam or composite, endodontics, nonsurgical periodontal treatment, and radiographs are free of charge. For dentures, crowns, and bridges, the patient pays 50 percent of the treatment; a bonus of 10 percent is refunded if the patient verifies annual dental appointments. As of 2005, dental prostheses are no longer refunded as a percentage of the total cost, but patients will receive a fixed amount based on their dental state. Preventive dental services, inlays, ceramic crowns on molars, and implants are not covered by insurance funds.

There are no special dental care programs for frail and dependent elderly within the legal health care system.

Germany is now facing economic problems, especially due to increased unemployment, the increasing number of old people, and the unification of East and West Germany. These problems have resulted in a lower income for the legal health insurance. Legislation has established a limit up to which dentists can be paid per year. If the total number of dental services exceeds this limit, payment for single treatments are reduced. A comprehensive review of the German health care system has been published recently.[42]

United States

There is no special financing or delivery system specifically designed to meet the oral health care needs of noninstitutionalized elderly people in the United States. Oral health care services are provided in private dental offices, but some older adults are treated at community health centers. Private dental practitioners primarily treat independently living older adults who require little or no assistance in their activities of daily living and access dental care as would younger adults.[43]

Dentists in the United States are generally reimbursed on a fee-for-service basis, paid totally by the individual or by a combination of out-of-pocket expense by the individual and private/public dental insurance. One important barrier to receiving dental care for low-income older adults is the cost of care.[44]

Through payroll deductions, all working people contribute to the federal Social Security program. The Social Security program also includes the Medicare program, which is the primary source of financing for geriatric medical care in the United States. Medicare does not reimburse expenses for routine dental care. Public financing of dental services is primarily limited to lower-income older adults through the Medicaid program, which is administrated by state governments. Federal law mandates a specific minimum of health insurance benefits and minimum eligibility standards that all state Medicaid programs must include. The federal benefit package mandates dental care only for children and adolescents. Medicaid does not provide coverage of dental services for older adults in every state. In fact, it has been reported that "twenty-seven states are failing to meet even the most minimal standards of care."[45] Dentists have the option to accept or limit patients enrolled in the Medicaid program. Two reasons that are often given by dentists for not accepting Medicaid patients are that the fee paid to dentists for treating these patients is too low and that there are limitations on the procedures for which Medicaid will pay.[46] Two other federally supported programs, the Old Age Pension Program and the Post Eligibility Treatment of Income (PETI) program, also provide limited payment for dental services.[44] The advocacy group Oral Health America has characterized the overall grade for oral health care of older adults in America a "D" due to the many gaps in coverage and other access issues.[45]

Similar to Europe, the institutionalized and homebound or frail elderly in the United States are among those in greatest need of care, but they seem to have the least access to dental services.[44] Nursing homes that receive Medicare or Medicaid payments are legally responsible for the dental care of their residents, including performing an oral health assessment, which must be completed within fourteen days of admission to the nursing home and must be updated annually. In reality, however, these requirements are far from being met in many long-term care facilities in a way that would improve the residents' oral health. In addition, few dentists are willing to travel to these facilities to deliver treatment. A comprehensive review of these and related issues has been reported by Berkey and Berg.[44]

Comparing Elder Dental Care Access in Europe and the United States

Dental care for independently living older adults in the United States as well as in Denmark, Norway, and Germany is primarily provided by private dental practitioners only. In Sweden, independently living older people can choose between private dental practitioners or the public dental service, and in the United Kingdom they can choose between private dental practitioners or the National Health Service. Dental treatment for independent older adults is not free of charge in any of these countries, but most preventive and restorative dental services in the majority of the European countries mentioned are subsidized, by law, by dental insurance systems financed either by governments or by a fee paid in part by the employer and in part by the employee. In Norway, dental treatment for independent older adults is paid totally by the patient.

Theoretically, financial barriers to dental treatment ought to be less important in these European countries, except possibly in Norway, as compared to the United States. However, this assumption may not be entirely correct. Some of the studies referred to in this review indicate that costs of care might influence access for those of limited means.[18,21,27] Research has consistently shown social inequalities in oral health and in the use of dental services in the Scandinavian countries[20,47,48] as well as in the United States.[49] Although Palmqvist et al.[50] reported that higher income and education levels were significantly associated with "best dental status" among older adults in Denmark but not in Sweden, Avlund et al.[24] found rather strong social inequalities in oral health status and use of dental services in a population of generally healthy, very old Swedes, within public health policies that have tried to minimize these inequalities.

Homebound, chronically ill, and institutionalized elderly people are considered to be a high-risk group in the oral health services. For these people, special dental care programs are available on-site in Denmark, Norway, and Sweden and are almost free of charge for the patient. Eligibility for non-institutionalized older adults to be enrolled in these programs is based on a medical evaluation. In the United States, nursing homes that receive Medicare and Medicaid payments are required by law to offer dental care for their residents. In the United States as well as in Europe, however, private dental practitioners are generally hesitant to provide domiciliary dental care to these groups of frail and functionally dependent patients. One reason may be that, due to high dental office overhead expenses, the dentist may be reluctant to spend time away from his or her main dental practice. Another reason may be problems related to management of medically compromised older patients, in particular, patients with dementia, stroke, etc.[32] In Denmark, Norway, and Sweden, the public dental service may have a better basis for offering outreach dental services than private dental practitioners, because the municipalities (in Denmark) or the counties (in Norway and Sweden) make the investment in equipment, and the dentists are paid a fixed salary.

As previously mentioned, inadequate undergraduate or postgraduate training in geriatric dentistry also may discourage practitioners from seeking opportunities to treat geriatric dental patients with challenging oral health problems, medical challenges, and/or psychosocial concerns. Several European dental schools have undergraduate courses in geriatric dentistry. In some dental schools, geriatric dentistry has been established as a freestanding department or program, while in other dental schools, the curriculum is being taught integrated with existing courses. Some dental schools only give a series of lectures on geriatric dentistry, while other schools provide the dental students with a comprehensive intramural clinical component ("senior dental clinic") and/or an extramural rotation. In a few schools, dental students and dental hygiene students work together as a team and interact with nursing staff in long-term care facilities. There are no formal postgraduate specialty training programs in geriatric dentistry in any of the European countries discussed in this review; nevertheless, a few dental schools offer master of science programs or Ph.D. programs in gerontology and geriatrics, and their main focus is on research training.

Within the United States, dental schools utilize similar predoctoral geriatric dentistry training options. In contrast to the aforementioned European countries, since the early 1980s there have been a small number of one- or two-year postgraduate geriatric dentistry fellowship programs sponsored by both the federal government and universities. Thus, in the United States, there is a small core of well-educated dentists specially trained to meet the needs of medically compromised, functionally dependent, and institutionalized elderly patients. Many of these dentists also teach geriatric dentistry in dental schools and postgraduate courses. The shortage of skilled gerodontists, however, is still a pronounced problem in the United States as well as in Europe.

Summary

The availability of dental services, the organization of the dental health care delivery system, and price subsidy for dental treatment are significant mitigating factors that may influence the use of dental services among older people. Additionally, studies have shown that the presence and number of natural teeth are highly correlated with dental visits, both in Europe and in the United States. For older people, dental care-seeking behavior is also impelled by several other factors in addition to perceived need for care, regardless of dentate status.[51,52] Positive attitudes toward dental care and a variety of social and behavioral factors have been reported to be important influences of dental service use. An active assessment of and attention to these factors and an in-

creased focus on undergraduate and postgraduate training in geriatric dentistry may be meaningful in order to increase access to dental care for older people.

In conclusion, the socioenvironmental context of a society, the oral health care system, and the personal characteristics of the individual may directly or indirectly influence the use of appropriate oral health services by aging populations.

Acknowledgments

The authors would like to thank Dr. Angus W.G. Walls, University of Newcastle upon Tyne, for his excellent help in reviewing the section describing the dental health care delivery system in the United Kingdom.

REFERENCES

1. Kinsella K, Suzman R, Robine J-M, Myers G. Demography of older populations in developed countries. In: Grimley EJ, Franklin Williams T, Lynn BB, Michell J-P, Wilcock GK, eds. Oxford textbook of geriatric medicine. 2nd ed. Oxford: Oxford University Press, 2000:7-19.
2. Kane RL, Ouslander JG, Abrass IB. Essentials of clinical geriatrics. 3rd ed. New York: McGraw-Hill, 1994.
3. Fiske J. The delivery of oral care services to elderly people living in a noninstitutionalized setting. J Public Health Dent 2000;60:321-5.
4. Locker D, Leake JL, Main PA, Hicks T, Hamilton M. Utilization of dental services by older adults in four Ontario communities. J Can Dent Assoc 1991;57:879-86.
5. Petersen PE, Holst D. Utilization of dental services. In: Cohen LK, Gift HC, eds. Disease prevention and oral health promotion. Copenhagen: Munksgaard, 1995:341-86.
6. Kronström M, Palmkvist S, Söderfeldt B, Vigild M. Utilization of dental health services among middle-aged people in Sweden and Denmark. Acta Odontol Scand 2002;60:276-80.
7. Davis P. Converting the need for care into demand for services. Int Dent J 1982;32:271-80.
8. Vigild M. Benefit related assessment of treatment need among the institutionalized elderly. Gerodontology 1993;10:10-5.
9. McNally M. Rights access and justice in oral health care: justice toward underserved patient populations—the elderly. J Am Coll Dent 2003;70:56-60.
10. Thorstensson H, Johansson B. Oral health in a population-based sample of the oldest-old: findings in twins 80 years and older in Sweden. Swed Dent J 2003;27:49-57.
11. Hugoson A, Koch G, Bergendahl T, Hallonsten A-L, Slotte C, Thorstensson B, Thorstensson H. Oral health of individuals aged 3-80 years in Jököbing, Sweden in 1973, 1983, and 1993. I. Review of findings on dental care habits and knowledge of oral health. Swed Dent J 1995;19:225-41.
12. Lundgren M, Österberg T, Emilson G, Steen B. Oral complaints and utilization of dental services in relation to general health factors in an 88-year-old Swedish population. Gerodontology 1995;12:81-8.
13. Nordström G, Bergman B, Borg K, Nilsson H, Tilberg A, Wenslöv J-H. A 9-year longitudinal study of reported oral problems and dental and periodontal status in 70- and 79-year-old city cohorts in northern Sweden. Acta Odontol Scand 1998;56:76-84.
14. Sjöström O, Lind SO, Holst D. Pattern of attendance to dentists and hygienists in the county of Göteborgs and Bohus län during 1990-1992. Community Dent Health 1998;15:77-81.
15. McGrath C, Bedi R, Dhawan N. Factors influencing older people's self reported use of dental services in the UK. Gerodontology 1999;16:97-102.
16. Nitschke I, Müller F, Hopfenmüller W. The uptake of dental services by elderly Germans. Gerodontology 2001;18:114-20.
17. Vigild M. Oral health care programmes for elderly in Scandinavia. Int Dent J 1992;42:323-9.
18. Österberg T, Lundgren M, Emilson C-G, Sundh V, Birkhed D, Steen B. Utilization of dental services in relation to socioeconomic and health factors in the middle-aged and elderly Swedish population. Acta Odontol Scand 1998; 56:41-7.
19. Suominen-Taipale AL, Nordblad A, Alanen P, Alha P, Koskinen S. Self-reported dental health, treatment need and attendance among older adults in two areas of Finland. Community Dent Health 2001;18:20-6.
20. Petersen PE, Kjøller M, Christensen LB, Krustrup U. Changing dentate status of adults, use of dental health services, and achievement of National Dental Health Goals in Denmark by the year 2000. J Public Health Dent 2004;64:127-35.
21. Bagewitz IC, Soderfeldt B, Palmqvist S, Nilner K. Dental care utilization: a study of 50- to 75-year-olds in southern Sweden. Acta Odontol Scand 2002;60:20-4.
22. Rickardsson B, Hanson BS. Social network and regular dental care utilization in elderly in Sweden: results from the population study "Men born in 1914," Malmö, Sweden. Swed Dent J 1989;13:151-61.
23. Holtzman JM, Akiyama H. Symptoms and the decision to seek professional care. Gerodontics 1985;1:44-9.
24. Avlund K, Holm-Pedersen P, Morse DE, Viitanen M, Winblad B. The strength of two indicators of social position on oral health among persons over the age of 80 years. J Public Health Dent, in press.
25. Roberts-Thomson K, Brennan DS, Spencer AJ. Social inequality in the use and comprehensiveness of dental services. Aust J Public Health 1995;19:80-5.
26. Osler M, Prescott E. Psycho-social, behavioural, and health determinants of successful smoking cessation: a longitudinal study of Danish adults. Tob Control 1998; 7:262-7.
27. Österberg T, Era P, Gause-Nilsson I, Steen B. Dental state and functional capacity in 75-year-olds in three Nordic localities. J Oral Rehabil 1995;22:653-60.
28. Petersen PE, Nørtov B. General and dental health in relation to life-style and social network activity among 77-year-old Danes. Scand J Prim Health Care 1989;7:225-30.

29. Avlund K, Holm-Pedersen P, Schroll M. Functional ability and oral health among older people: a longitudinal study from age 75 to 80. J Am Geriatr Soc 2001;49:954-62.
30. Avlund K, Holm-Pedersen P, Morse DE, Viitanen M, Winblad B. Tooth loss and caries prevalence in very old Swedish people: the relationship to cognitive function and functional ability. Gerodontology 2004;21:17-26.
31. Ettinger RL. Oral health care programs for homebound people, nursing home residents and elderly inpatients. In: Holm-Pedersen P, Löe H, eds. Textbook of geriatric dentistry. 2nd ed. Copenhagen: Munksgaard, 1996:536-59.
32. Fenwick JE, Batchelor PA, Samarawickrama DYD. Reasons for referral of very elderly patients to the Community Dental Service in rural England and the implications for developing oral health care services. Gerodontology 1998;15:67-72.
33. Nitschke I, Müller F, Ilgner A, Reiber T. Undergraduate teaching in gerodontology in Austria, Switzerland and Germany. Gerodontology 2004;21:123-9.
34. Kinsey JG, Winstanley RB. Utilization of domiciliary dental services. Gerodontology 1998;15:107-12.
35. Ettinger RL, Beck JD, Kerber P, Scandrett FR. Dental students' confidence in prosthodontics and attitudes toward the elderly. J Dent Educ 1982;46:541-7.
36. Kiyak HA, Brudvik J. Dental students' self-assessed competence in geriatric dentistry. J Dent Educ 1992;56: 728-34.
37. Vigild M, Holst D. Oral health services for elderly in countries with mainly publicly financed health care. In: Holm-Pedersen P, Löe H, eds. Textbook of geriatric dentistry. 2nd ed. Copenhagen: Munksgaard, 1996:517-27.
38. Walls AWG, Steele JG. Geriatric oral health issues in the United Kingdom. Int Dent J 2001;51:183-7.
39. Reaktionen auf ein staatliches Gesundheitswesen: Medizinische und zahnmedizinische Versorgung in Schottland—zwei Beispiele. Zahnärztliche Mitteilungen 2000;90(21):94-6. At: www.zm-online.de/zm/21_00. Accessed: August 2005.
40. Falcon HC, Hurst CP. A public perception of access to NHS dentistry. Br Dent J 1998;184:351-3.
41. McGrath C, Bedi R, Dhawan N. Who has difficulty in registering with an NHS dentist? A national survey. Br Dent J 2001;191:682-5.
42. Nitschke I. Geriatric oral health issues in Germany. Int Dent J 2001;51:235-46.
43. Dolan TA, Berkey DB, Mulligan R, Saunders MJ. Geriatric dental education and training in the United States: 1995 White Paper findings. Gerodontology 1996;13: 94-109.
44. Berkey D, Berg R. Geriatric oral health issues in the United States. Int Dent J 2001;51:254-64.
45. A state of decay: the oral health of older Americans. An Oral Health America grading project. Chicago: Oral Health America, September 2003.
46. Berg R, Berkey DB. Oral health and aging: finances. Quintessence Int 1997;28:614-7.
47. Petersen PE. Social inequalities in dental health: towards a theoretical explanation. Community Dent Oral Epidemiol 1990;18:153-8.
48. Norlén P, Ostberg H, Björn AL. Relationship between general health, social factors and oral health in women at the age of retirement. Community Dent Oral Epidemiol 1991;19:296-301.
49. Manski RJ, Magder L. Demographic and socioeconomic predictors of dental care utilization. J Am Dent Assoc 1998;129:195-7.
50. Palmqvist S, Söderfeldt B, Vigild M, Kihl J. Dental conditions in middle-aged and older people in Denmark and Sweden: a comparative study of the influence of socioeconomic and attitudinal factors. Acta Odontol Scand 2000;58:113-8.
51. Kiyak HA. Explaining patterns of dental service utilization among the elderly. J Dent Educ 1986;50:679-87.
52. Tennstedt SL, Brambilla DL, Jette AM, McGuire SM. Understanding dental service use by older adults: sociobehavioral factors vs need. J Public Health Dent 1994;54:211-9.