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ORIGINAL RESEARCH

What Are the Determinants of Dental Care Expenditures in Institutions for Adults With Disabilities? Findings From a National Survey

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Abstract

Objective: To analyze the determinants of dental care expenditures in institutions for adults with disabilities.

Design: Health and disability survey and insurance database.

Setting: Institutional setting.

Participants: Adults (N=2222) living in institutions for people with cognitive, sensory, and mobility disabilities.

Interventions: Not applicable.

Main Outcome Measures: We used a Heckman selection model to correct for potential sample selection bias due to the high percentage of non–dental care users. The Heckman selection model is a 2-step statistical approach based on the simultaneous estimation of 2 multiple regression models—a selection equation (step 1) and an outcome equation (step 2)—offering a means of correcting for nonrandomly selected samples. The selection equation modeled whether the individual had consulted a dentist at least once, whereas the outcome equation explained the dental care expenditures. Disability severity was assessed by scoring mobility and cognitive functional limitations. Regressions also included sociodemographic characteristics and other health-related variables.

Results: Individuals with the highest cognitive limitation scores, without family visits, without supplementary health insurance, and with poor oral health status were less likely to consult a dentist. After controlling for potential selection bias, the only variable that remained statistically significant in the outcome equation was the oral health status: when individuals with poor health status had consulted at least once, they had a higher level of dental care expenditure.

Conclusions: Functional limitations were barriers to accessing dental care even in institutions for adult with disabilities. These barriers should be overcome because they may worsen their oral health status and well-being. Given the lack of literature on this specific topic, our results are important from a policy perspective. Health authorities should be alerted by these findings.

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Even though persons with disabilities constitute a sizable and growing proportion of the population,[1] they are often understudied and underserved. The World Health Organization estimates that ~15% to 20% of adults worldwide have a disability (based on the World Health Statistics and the Global Burden of Disease study). As mentioned in the world report on disability,[1] people with disabilities report lower educational achievements, are less economically active, experience higher rates of poverty, and have poorer health outcomes, including oral health.[2-10] Yet, oral health status is essential to well-being. Oral diseases negatively affect quality of life because they may have a severe effect in terms of pain and suffering.[11] The relation between oral health and general health is clearly complex; this is primarily because of risk factors that are common to both of them. In some cases oral problems, such as dental infections, can be the cause of certain chronic and disabling conditions. In other cases, oral problems can be the

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consequence of a systemic disease, either directly as an oral manifestation or indirectly due to the side effects of treatments.[11-15]

Dental care and oral disease treatments are extremely costly and typically associated with problems of financial accessibility in the general population.[11,16] This is particularly true when dental care is subject to a high out-of-pocket expenditure. In France, a quarter of dental care expenditures remains the responsibility of the patient after the use of public health insurance and supplementary health insurance.[17] Such problems of accessibility are amplified in disadvantaged groups, as is the case for people with disabilities; indeed, they have limited access to dental care, which leads to worsening of their oral health status.[18-20] For instance, a systematic review[21] conducted in 2010 showed that people with an intellectual disability have poorer oral hygiene and a higher prevalence and greater severity of periodontal disease than do the rest of the population. Disability is not a risk factor for oral hygiene—related disease per se, but for individuals with self-care limitations, its link to oral hygiene—related disease qualifies this population as patients with special care needs.[22-24]

Little is known about routine dental care practices in adults with disabilities living in institutions. Institutions for adults with disabilities are often better equipped to handle people's medical needs, but they can fall short in other aspects of care. Evidence shows that living in a nursing home is an additional barrier to accessing some health care services such as cancer screening and specialized outpatient care.[25,26] Studies[12,15,27-30] interested in the issue of dental care have focused on community-dwelling people and specific populations such as children or the elderly, and for this reason it is difficult to produce a comprehensive update on dental care practices and to give a clear picture of dental care in people with disability living in institutions. A French study[16] conducted in the elderly showed that the probability of having visited a dentist during the previous year was reduced by 25% for institutionalized people when compared with community-dwelling individuals. More recently, another French study[25] conducted in adults older than 18 years showed that higher levels of disability negatively influenced the likelihood of having consulted a specialist or a dentist at least once in the previous year.

Given the background concerning the disadvantages that affect adults with disabilities as well as the lack of literature on dental care level in adults living in institutions, we aimed to analyze the determinants of dental care expenditures in this population.

Methods

Data sets

This study was based on (1) the Health and Disability Survey — Institutions Section (HSI; available at http://www.drees.sante.gouv.fr/les-enquetes-handicap-sante,4267.html,4267.html,4267.html) conducted in 2009 by the French National Institute of Statistics and Economic Studies and the French Directorate for Research, Studies, Evaluation and Statistics — Ministry of Health and (2) the French National Health Insurance (SNIIRAM) database. HSI data were collected from a sample of people living in different types of institutions: nursing homes, shelter centers for social reintegration, mental health facilities, and institutions for people with cognitive, sensory, and mobility disabilities. The SNIIRAM database contains all data on reimbursed care by the French national health insurance. For each patient, data from the HSI were matched with those from the SNIIRAM database to describe the association between health status, disability, and dental expenditure of this population. The postsurvey matching of data with those from the SNIIRAM database was undertaken by the French National Institute of Statistics and Economic Studies and French Directorate for Research, Studies, Evaluation and Statistics — Ministry of Health, and it was successful for 70% of the sample.[31]

List of abbreviations:

HSI	**Health and Disability Survey — Institutions Section**
SNIIRAM	**French National Health Insurance**

Study participants

From the HSI population, we selected institutions for adults with cognitive, sensory, and mobility disabilities. This corresponded to 456 institutions and 2222 individuals for whom the matching of data with the data from the SNIIRAM database was successful. Institutions for adults with disabilities accept residents with a wide range of functional limitations such as people who cannot perform basic activities of daily living alone and/or need constant medical supervision but also people who maintain certain levels of autonomy in activities of daily living and, in some cases, had a professional activity in a protected workplace.

Statistical analysis

Because 1582 individuals in the sample did not consult a dentist and thus did not have any dental care expenditures, we used a Heckman sample selection correction model, hereafter called the Heckman selection model.[32,33] The Heckman selection model is a 2-step statistical approach based on the simultaneous estimation of 2 multiple regression models—a selection equation (step 1) and an outcome equation (step 2)[34,35]—offering a means of correcting for nonrandomly selected samples. Indeed, using cost data from only those who had consulted a dentist would have led to selection bias by overrepresenting dental care users. In contrast, using data from all 2222 individuals including individuals with 0 euro expenditures would not have been a fair estimate of what the individuals would have spent if they had the real choice to consult. Before running the Heckman selection model, preliminary analyses were performed to ensure that we could select at least 1 appropriate "exclusion variable" that had a significant effect on the decision to consult a dentist, but no effect on the level of dental care expenditures. A flowchart of the selection of variables is given in figure 1.

Dependent variables

The dependent variable in the selection equation (step 1) was a binary variable with a value of 1 if the individual had consulted a dentist at least once in the previous year and 0 otherwise. The dependent variable in the outcome equation (step 2) was the natural logarithm of dental care expenditure in the previous year.

Independent variables

Independent variables: Disability severity

The severity of disability was assessed according to the level of functional limitation. We constructed 2 continuous severity scores,