



A difference-in-differences analysis of the effect of free dental check-ups in Scotland

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ABSTRACT

The Scottish Government introduced free NHS dental check-ups in April 2006 as a way of encouraging utilisation and improving the oral health of residents. We use data from the British Household Panel Survey (BHPS), a nationally representative data of 117761 individual respondents in the United Kingdom covering the period between 2001 and 2008 to evaluate the impact of this policy on utilisation of NHS dental check-ups in Scotland, using a difference-in-difference approach. Results show that there was a 3–4 percent increase in NHS dental check-up in Scotland, compared to the rest of the UK. Results suggest that a removal of financial barrier to dental check-ups does indeed lead to a modest increase in utilisation, and may have wider implications for the delivery of dental care in Scotland.

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Introduction

In a 2003 consultation document, the Scottish Executive stated that oral health in Scotland was poorer than in many other European countries, and people in Scotland had substantially higher levels of tooth decay than those in England and Wales (Scottish Executive, 2003). Some supporting statistics within that consultation document showed that the average Scottish adult had lost 8 adult teeth and had 10 teeth filled by middle age, while 41% of dentate adults in Scotland reported having some dental pain within a period of 12 months. In addition, over 60% of children in deprived areas had dental disease by the age of 3, while by the age of 14, over 67% of children already had decay in their adult teeth.

It was perhaps not surprising that in 2006, the Government of Scotland introduced a policy of free National Health Service (NHS) dental check-ups for all residents of Scotland, as a way of not only improving utilisation of NHS dental care services, but also of improving the oral health of the population. It is known that access to dental check-up is a lead indicator of future oral health problems (Newhouse & the Insurance Experiment Group, 1993).

Governments can and do indeed intervene in promoting health and dental care services utilisation either through price regulations or through subsidies. In some cases, certain sections of the population are targeted for exemption from health and dental care

services as a way of improving access to these services. In the UK for example, certain sections of the population are exempted from NHS health and dental care services on account of age, maternity and also for those receiving income support due to disability, unemployment, etc. However, such targeted exemptions may be largely ineffective in improving access (Masiye, Chitah, & McIntyre, 2010; Ponsar et al., 2011).

Researchers however acknowledge the effectiveness of complete abolition of user fees or charges in improving access to health and dental care services. Ponsar et al. (op cit) found that user fee abolition for large population groups led to rapid increases in utilisation of health services and coverage of essential health needs in a number of countries in Sub-Saharan Africa. Similarly, Masiye et al. (op cit) found a 55% increase in utilisation among the rural population in Zambia (aged at least 5 years) following a major shift from targeted exemptions to free primary health care across the board. They conclude that fee removal is more effective than fragmented exemption policies to certain groups in providing protection against the financial consequences of health service use.

In some cases, the effect of across the board abolition of user fees may be very limited in increasing the utilisation of preventive care services. For example, Wilkinson, Gouws, Sach, and Karim (2001) investigate the impact of removal of user fees for children aged under 6 and pregnant women on clinic attendance patterns in a rural South African Health District. They studied average quarterly new registrations and total attendances for preventive services (such as antenatal care, immunization and growth monitoring) and curative services (such as treatment of ailments) at a modern

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primary health-care unit over a period between 1992 and 1998. Using regression analysis to assess whether trends were statistically significant, they found that although removal of user fees improved access to curative services, this may have happened at the expense of some preventive services.

Although the literature on the effect of the abolition of user fees largely represents developing country experiences (from Africa), it may hold some evidence about the expected effects of the introduction of free dental check-ups in Scotland. Prior to free check-ups, anyone needing an NHS dental check-up was expected to pay an equivalent of 80% of the cost of the check-up, subject to a maximum, unless they were exempt. So far, there is no systematic evidence to show whether the introduction of free NHS dental check-ups has had any impact in Scotland, compared to the rest of the United Kingdom.

The free dental care policy was only introduced in Scotland, and not in the rest of the UK, thus providing a natural experiment with which to evaluate its effect on utilisation of NHS dental check-ups, using the rest of the UK as comparator. The objective of this paper is to employ a difference-in-differences (DID) method in analysing the impact of the policy on NHS dental check-ups in Scotland using data from the British Household Panel Survey (BHPS). It compares dental check-ups in Scotland versus the rest of the UK, before and after the introduction of the policy, isolating the effects of the policy to evaluate its impact.

Background information: dental care in Scotland

Any individual requiring NHS dental care can normally receive this service through the NHS General Dental Service (GDS). Every NHS Health Board has a responsibility to provide dental care services to individuals resident in Scotland. Individuals (or potential patients) are expected to register with a dental practitioner, usually a private independent dental practice, who contract their services to the NHS for an agreed fee. Those who are unable to register through these independent dental practices can still receive dental care services through services usually provided by salaried dentists directly employed by the NHS Health Boards. This set up means that the independent general dental practitioners (GDPs) are free to (and do indeed) treat both NHS and private patients. While private patients have to bear the full cost of their check-up, NHS patients have been entitled to free dental check-ups since the introduction of the policy in Scotland.

The costs of NHS dental check-ups are borne by the Government through the Health Boards, who pay the independent GDPs for all individual items of treatment they provide their registered patients. As well as these payments, monthly fees are paid per patient for children (18 years and younger) registered in capitation and adults registered in continuing care. Figures from the Information Services Division (ISD) of NHS Scotland show that the average GDS dental fees paid per head of adult population in the financial year ending March 2012 was £46 (ranging between £23 in Orkney and £57 in Greater Glasgow and Clyde). For children, this cost ranged between £32 in Western Isles Health Board and £73 in Greater Glasgow and Clyde Health Board, with an average Scotland cost of £63 per head of child population. ISD statistics also show that since 31st March 2005, cost per head of child population has increased by 50%, from £42 to £63; and cost per head of adult population by 44%, from £32 to £46. These cost increases are attributed to increased registrations through patient registration policy changes such as the introduction of lifetime registrations in April 2010, and also to changing population trends (before April 2009, patient registration would normally lapse after 15 months if the dental patient did not attend the practice where they were registered). The level of the Scottish population (all ages) registered with an NHS GDS dentist was 78.0%, up from 76.8% as at

31st December 2011. ISD dental activity data showed a 5.5 percent increase in the number of dental examinations (including all clinical, extensive clinical and full case assessment examinations) carried out by GDS dentists between 2010/11 and 2011/12.

Individuals can also receive dental care services privately if they so choose. Indeed some individuals do register with private dental care insurance providers such as Denplan, who currently have 1.8 million patients registered across the UK. Any patients registering with Denplan would normally undergo a dental assessment and placed in one of the following five categories, A (corresponding to relatively good oral health and low future dental care needs), B, C, D or E (relatively poor oral health and high future dental care needs). The Dental Workforce Report 2012 (NHSNS and NES 2012) reports a 76 percent overall increase in the number of patients registered with Denplan between April 2001 and April 2008, followed by a 15 percent reduction between 2008 and 2012.

Review of literature

This review of literature summarises the traditional determinants of utilisation of (or demand for) dental care services. The demand for dental check-up is derived from the demand for good (or improvements in) oral health. The *Grossman model (1972)* provides the pioneer analytical framework to analyse the demand for health. Attendance at dental check-ups or utilisation of dental check-up is different from the usual hospital attendance in that this is a preventive rather than a curative service. Accordingly, the opportunity cost of not attending a preventive care service may be lower than that for not attending a curative care service. Indeed, an individual's inability to attend a curative care service may be life threatening and consequently have a negative impact on their quality of life. In addition to the generally held view that preventive medicine is often a more efficient use of resources than curative medicine (*Helwege, 1996*), people generally prefer preventive care to curative care because they believe that small efforts at prevention will be repaid by large reductions in the later need for cure (*Ubel, Spranca, Dekay, Hershey, & Asch, 1998*).

Researchers identify various demand and supply side factors that determine individuals' utilisation of dental care services. These factors include gender, supply side issues such as the availability of dentists or dental recall, insurance and income, as well as perceptions and political attitudes. There is also evidence of the effect of past use on current use.

Propper (2000) reports on the importance of past use as a predictor of current use of health and dental care services, using data from the BHPS. Evidence of persistence shows that current use of NHS dental care services increases the probability of future use of NHS dental services. Some researchers have also identified the importance of perceptions and political attitudes on the use of private health services. For example, using data from the BHPS, *Propper (op cit)* shows that Conservative party support is positively associated with private dental service use and negatively associated with public dental service use.

Like income, dental health insurance (or the absence of it) is usually a key determinant of individuals' utilisation of dental care services. *Davies et al. (1987)* use data from RAND's Health Insurance Experiment to study the effects of health insurance on utilization, health status and attitudes towards care. In addition to having dental insurance, they also found that attitudes were also an important determinant of dental utilisation. They find that adults with less favourable beliefs and attitudes were less likely to use services, while those in poorer health states were less likely to use dental services.

Nguyen and Häkkinen (2005) examine the role of supply side factors in the decision-making process of utilization of dental

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