

A utilisation profile of publicly financed oral examinations in the Republic of Ireland

Edward Henry,¹ Aoife Brick² and Conor Keegan²

¹*Discipline of Economics, JE Cairnes School of Business and Economics, National University of Ireland Galway, Ireland;* ²*Social Research Division, Economic and Social Research Institute, Ireland and Trinity College Dublin, Ireland*

Aim: To develop a utilisation profile for oral examinations performed under the remit of publicly financed dental services in the Republic of Ireland as a proxy for the overall level of service use. **Basic research design:** Collation of data from multiple administrative datasets for 2018, and generation of an age-specific oral examination utilisation profile. **Main outcome measure:** Age-specific oral examination rates per 1,000 population. **Results:** A total of 1,163,399 publicly financed oral examinations were performed. Comparably low population-adjusted oral examination rates were observed in the 0-15, 16-24 and 75+ age cohorts. **Conclusions:** The National Oral Health Policy in Ireland aims to improve access to oral healthcare services across the life-course. Young children and older adults are highlighted as population subgroups with low levels of service eligibility and engagement, respectively. These results reinforce the need to focus on these age cohorts.

Keywords: Dental care, dental health services, community dentistry, oral examination

Introduction

In recent decades, there have been marked improvements in Irish oral health, most notably reductions in the rate of dental caries in children and increased retention of teeth in older adults (Department of Health, 2019; Naseer *et al.*, 2018; Whelton *et al.*, 2006). These advances, together with an ageing and growing population and concern over gaps in routine care for certain population groups, have highlighted the need to reform service delivery. Accordingly, policymakers introduced the National Oral Health Policy (NOHP), “Smile agus Sláinte” (Department of Health, 2019).

Deficiencies in data collection and integration present challenges to those tasked with implementing such reforms (Houses of the Oireachtas Committee on the Future of Healthcare, 2017). Recognition that robust data are essential in developing a well-coordinated and efficient health service has been expressed specifically in the context of dental service provision. Aligned with World Health Organization recommendations, a key strand of the NOHP is the establishment of a national database of oral healthcare metrics (Department of Health, 2019), central to which has been the roll-out of a National Dental Record and Information System (NDRIS) by the Health Service Executive (HSE). The fully digitised system, holding almost 900,000 patient charts, provides HSE dentists with a means of more effectively managing individual patients. This large-scale administrative dataset will also aid public dental health monitoring; provide a baseline for evaluation of the impact of future interventions; and reduce reliance on occasional survey-based data (Department of Health, 2019; eHealth Ireland, 2019; Health Service Executive, 2019). In this paper, we describe the first use of these data in a research setting.

Irish dental services are financed and delivered in a mixed public-private system (Woods *et al.*, 2017). The

state-financed elements of these services comprise the Dental Treatment Services Scheme (DTSS), the Dental Treatment Benefit Scheme (DTBS) and HSE Public Dental Service (PDS).

Dental Treatment Services Scheme

The DTSS, administered by the HSE Primary Care Reimbursement Service (PCRS), seeks to improve the oral health of adult medical card holders with routine treatment being principally provided by self-employed dentists, who are remunerated by the HSE on a fee-per-item basis (Woods *et al.*, 2017). The scheme includes one oral examination per annum.

Dental Treatment Benefit Scheme

The DTBS is administered by the Department of Employment Affairs and Social Protection (DEASP). It is accessible to employees aged 16+ years, retired people and dependant spouses or partners with the required number of pay-related social insurance (PRSI) contributions in an eligible class. Those eligible are entitled to an annual oral examination.

HSE Public Dental Service

The PDS provide routine and emergency care to children under 16 years and to adults who hold a medical card (entitling them to free public health services). The service operates targeted clinical assessment of children at ages 8, 10 and 12 with onward referral for secondary care in an oral health or orthodontic context where necessary. Generally, the only publicly financed services provided to pre-school children are emergency care, parental/carer education and secondary care referrals (Department of Health, 2019; Woods *et al.*, 2017). The HSE directly employs dentists and other oral healthcare professionals to deliver care to those eligible.

In 2018, the combined expenditure on these schemes and services was €192 million (Department of Employment Affairs and Social Protection, 2019; Health Service Executive, 2018b; National Oral Health Office, 2020).

The nature of existing oral healthcare service structures, with differing cohorts having distinct approval mechanisms and eligibilities for varying schemes and services (see Figure 1), makes examination of the publicly financed system challenging. Nevertheless, the aim of this study was to develop a utilisation profile for publicly financed oral examinations performed in the Republic of Ireland in 2018 and, following a broad service definition and data scoping exercise, applicable administrative data were duly collated. The definition for an oral examination, used by the DTSS and DTBS and assumed for the PDS, is “a complete oral examination of hard and soft tissue, medical and dental history, recording of missing teeth, diagnosis and treatment plan” (Department of Employment Affairs and Social Protection, 2021; Health Service Executive, 2018a).

To our knowledge, this is the first time Irish oral examination data have been compiled in this manner. Functioning as a proxy for the overall level of utilisation/engagement, these findings may be employed to help corroborate or refute concerns expressed in the NOHP regarding service accessibility to users in specified age groups.

Materials and Methods

Multiple data sources, described below, were required to estimate a comprehensive utilisation profile for publicly financed oral examinations. Rates per 1,000 population for all services were calculated using population estimates for 2018 (Keegan *et al.*, 2020; Wren *et al.*, 2017). Ethical approval was not required as all anonymised data were extracted from administrative sources for secondary analysis. All analysis was conducted using Microsoft Excel for Office 365.

Dental Treatment Services Scheme: The HSE PCRS have published data on oral examinations approved for reimbursement in 2018 (Primary Care Reimbursement Service, 2018). The data are disaggregated into eight

age categories (16-24, 25-34, 35-44, 45-54, 55-64, 65-69, 70-74, 75+) with no disaggregation by sex available.

Dental Treatment Benefit Scheme: The total number of oral examinations claimed for by DTBS-eligible individuals in 2018, by single year of age and sex, were provided by the DEASP.

HSE Public Dental Service: Fully digitised NDRIS treatment records have been in use since March 2019. The number of targeted and patient-requested oral examinations performed under the remit of the PDS in the last three-quarters of 2019 were provided by the National Oral Health Office. An age-specific oral examination utilisation profile was generated for PDS users aged up to 16 years, accounting for 96% of PDS oral examinations carried out. The remaining 4% of PDS oral examination activity, relating to those 16 years or over, was omitted due to missing data. The mean number of oral examinations derived from these quarterly totals was used to estimate the annual total for 2019, assuming no seasonality or deviation in quarter one.

At the time of writing, 2018 was the most recent year for which data on other services and schemes were available. To align with the other services, age-specific oral examination rates for 2019 were applied to the 2018 population data (Wren *et al.*, 2017), to estimate the number of oral examinations in 2018. To facilitate comparison, the more granular PDS and DTBS utilisation profiles are aggregated to the DTSS level of age aggregation.

Results

Of an estimated 1,163,399 publicly financed oral examinations, the largest proportion, 53.6%, were claimed for by DTBS-eligible individuals. 32.4% were financed by the DTSS and the remainder, 14.1%, relate to the PDS (Figure 2).

The age-specific oral examination rates per 1,000 population for each service/scheme are displayed in Figure 3. Rates among the 0-15 and 16-24 age cohorts were the lowest observed (152.7 and 136.7 per 1,000 population, respectively). The overall utilisation rate increased markedly thereafter before falling in the 75+ age category. Also

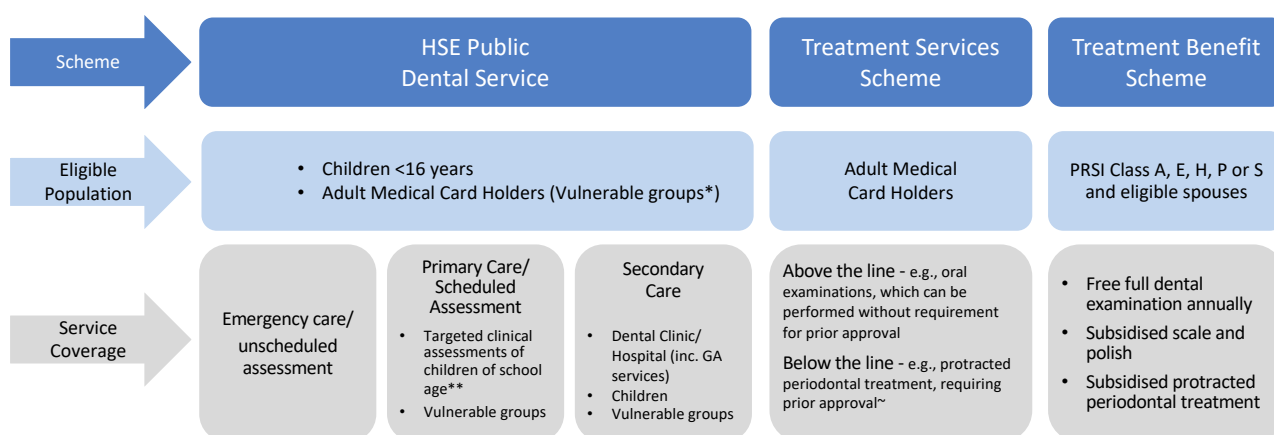


Figure 1. Schematic overview of publicly financed dental services provision in Ireland, 2018. Adapted with permission from Henry *et al.* (2021). * Services for other medical-card holders are provided, in general, by contracted dentists under the DTSS. ** Targeted by age, not by a clinical need-based risk assessment system. ~ Subject to certain conditions (e.g., generally one examination and two fillings each year); a wider range of treatments can be obtained for patients who are considered high-risk or vulnerable. These treatments are only provided on approval by local HSE Principal Dental Surgeon. Department of Health personal communication, 14 August 2020.

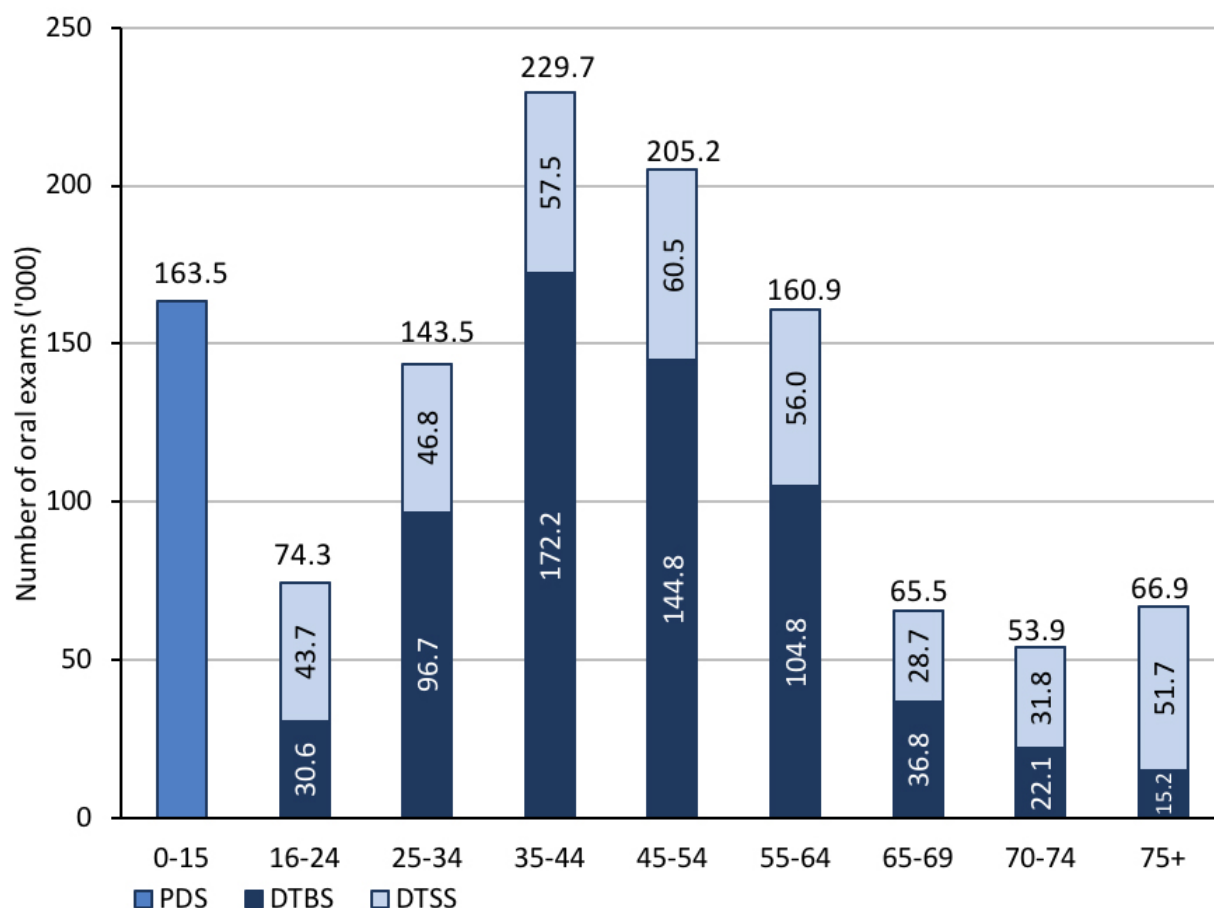


Figure 2. Age-specific number of publicly financed oral examinations, 2018. DTBS indicates Dental Treatment Benefit Scheme; DTSS, Dental Treatment Services Scheme; PDS, HSE Public Dental Service.

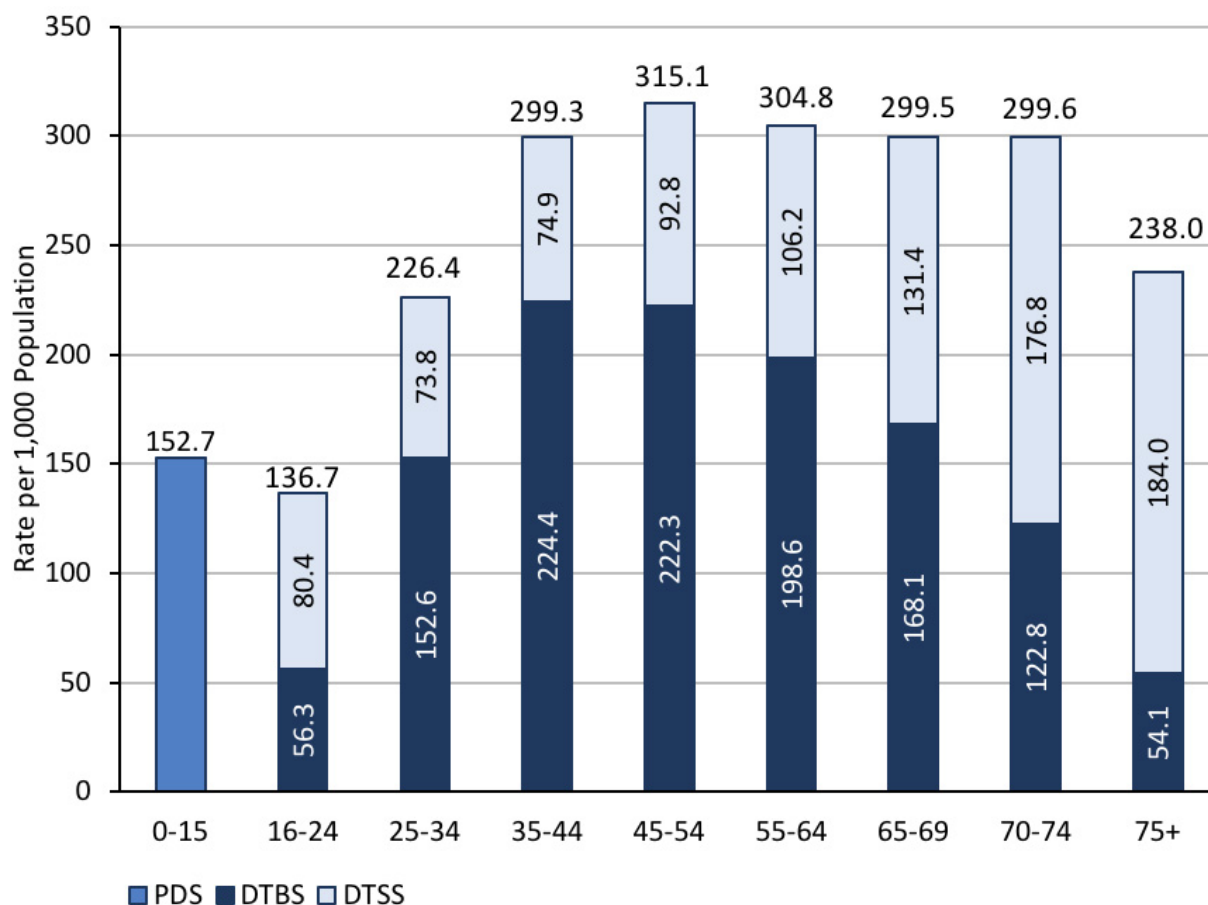


Figure 3. Publicly financed oral examinations per 1,000 population, 2018. DTBS indicates Dental Treatment Benefit Scheme; DTSS, Dental Treatment Services Scheme; PDS, Public Dental Service.

visible in older age categories (45-54 and older) is an increasing contribution of DTSS-financed oral examinations to the total rate. This likely reflects changing scheme eligibilities across age groups.

Discussion

Improvements in oral health, coupled with an ageing and growing population, have altered the requirements for Irish oral healthcare services. These changes have accentuated enduring inequalities in oral health and brought into question the accessibility of services to some individuals. The NOHP highlighted young children and older adults as groups not catered for by the existing system (Department of Health, 2019). This study underscores comparatively low population-adjusted oral examination rates in 0-15, 16-24 and 75+ age cohorts. The findings suggest low levels of general utilisation of publicly financed services/schemes in these categories and are consistent with policymakers' stated rationale for reorienting oral healthcare services.

Despite improvements in oral health, caries in the primary dentition is still observed in one-third of children under 6 years (Department of Health, 2019). Compounding the harmful sequelae of this disease, services available to this age cohort are limited, with attendances described as predominantly symptom-led (Department of Health, 2019; Woods *et al.*, 2017). The low levels of utilisation observed herein accord with this description and support extension of preventive oral healthcare packages to this group.

Our findings concur with data from The Irish Longitudinal Study of Ageing (TILDA), indicating that a lack of awareness of the system and of respondents' eligibility has led to poor uptake of oral healthcare among older adults (Sheehan *et al.*, 2017). Concerns over this lack of engagement are heightened by the decreasing prevalence of edentulousness and retention of more teeth into older age. Thus, greater levels of care are required to maintain a functional dentition and provide better oral health-related quality of life (Department of Health, 2019).

Underutilisation of dental services in these age groups is not peculiar to Ireland. Recent estimates from Gao *et al.* (2020) suggest that utilisation is relatively low among preschool children in China. A similar pattern has also been observed in a US study, with only 53.6% of 1- to 5-year-old children receiving preventative dental care, compared to 94.7% of the same age group receiving preventative medical care (Kim & Kaste, 2013). As parental characteristics play a central role in child service utilisation, promoting both parent and child oral health education is important. For example, the early establishment of a dental home, and signposting parents toward services, have been proposed as key modifiers of service utilisation in this age cohort. (Department of Health, 2019; Gao *et al.*, 2020; Kim & Kaste, 2013; Nowak & Casamassimo, 2002).

Among older adults, McKenzie *et al.* (2017) found that service demand in the UK decreased with increasing age; the observed NHS dental care attendance rate of those aged 85 years and over was only 23% compared with 51% in aged 55-64. The authors attribute the low levels of utilisation in older age groups to access barriers rather than diminishing need. Enhancing oral health knowledge,

improving awareness of eligibility, capacity building of an age-friendly service, and adoption of a life-course approach have all been described as potential means of increasing service utilisation, and promoting oral health more generally, in this age category (Department of Health, 2019; Mittal *et al.*, 2019; Petersen and Ogawa, 2018).

The reorientation of Irish oral healthcare services, with a principal aim of redressing the observed gaps in routine oral healthcare by focussing on prevention, inclusivity and espousal of a primary care approach, appears wholly apposite. Nonetheless, ongoing appraisal will be essential in assessing the extent to which the NOHP achieves its primary goal of enabling every individual to achieve their personal best oral health (Department of Health, 2019).

This study has some limitations. First, the available data did not permit a more nuanced consideration of the determinants of utilisation such as socioeconomic status, educational background or regional variation in service availability. Second, we believe an assumption of a lack of seasonality in service utilisation during quarter one of 2019 in the calculation of the total number of annual PDS oral exams to be reasonable. However, any deviation from the overall pattern of quarterly utilisation would challenge this supposition. Third, since the NDRIS database has only recently been developed, an analysis of trends in age-specific utilisation was not possible. As further years of data become available it will be an invaluable resource for research and policy evaluation (Department of Health, 2019). Finally, with available data it is not possible to account for the activity in the two dental hospitals in the Republic of Ireland or the utilisation of privately financed dental services. It has been estimated that expenditure on privately financed provision accounted for two-thirds of total dental expenditure in 2018 (Central Statistics Office, 2020; Henry *et al.*, 2021).

Conclusion

This utilisation profile provides empirical evidence to support concerns raised in the NOHP over gaps in the provision of publicly financed routine oral healthcare services to significant groups of the population. The reorientation of services detailed in the policy, together with ongoing systemic appraisal of population oral health employing, among others, those newly-developed data sources described herein, will aid in future evaluation and enhancement of service accessibility and engagement.

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