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# UTILISATION OF PUBLICLY FINANCED DENTAL AND OPTICAL SERVICES IN IRELAND

## BASELINE ANALYSIS FOR THE HIPPOCRATES MODEL

EDWARD HENRY, AOIFE BRICK AND CONOR KEEGAN



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Edward Henry

Aoife Brick

Conor Keegan

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## **ABOUT THE AUTHORS**

Edward Henry was a Research Assistant at the ESRI when undertaking this work. Aoife Brick and Conor Keegan are Research Officers at the ESRI and Adjunct Assistant Professors at Trinity College Dublin.

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## ABBREVIATIONS

BIU	Business Information Unit – Community Healthcare
COS	Community Ophthalmic Service
COSMTS	Community Ophthalmic Services Medical Treatment Scheme
COSS	Community Ophthalmic Services Scheme
DEASP	Department of Employment Affairs and Social Protection
DES	Department of Education and Skills
DTBS	Dental Treatment Benefit Scheme
DTSS	Dental Treatment Services Scheme
HSE	Health Service Executive
NCPO	National Clinical Programme for Ophthalmology
NOHO	National Oral Health Office
OTBS	Optical Treatment Benefit Scheme
PCESRG	Primary Care Eye Services Review Group
PCRS	Primary Care Reimbursement Service
PDS	Public Dental Service
PRSI	Pay-Related Social Insurance
SYOA	Single year of age



**GLOSSARY**

Amalgam Restoration	A dental restoration made of an alloy of an element or metal with mercury
Apicectomy	Surgical removal of the root of a tooth
Community Ophthalmic Physician	Medical ophthalmologist directly employed by the HSE to treat eligible patients referred by general practitioners, public health doctors, public health nurses and/or ophthalmologists
Composite Restoration	A dental restoration comprising resin composite, a tooth-coloured filling material made of resin reinforced with silica or porcelain particles
Dispensing Optician	Advises on, fits and supplies the most appropriate spectacles after taking account of each patient's visual, lifestyle and vocational needs. Also advises on and dispenses low-vision aids to the partially sighted, as well as advising on and dispensing to children where appropriate.
Exodontics	Dental treatment involved in the extraction of teeth
Ophthalmologist	A medically trained doctor who has undertaken additional specialist training in the examination, diagnosis and management of disorders of the eye and visual system. They can prescribe medication and perform surgical procedures in the management of eye disorders.
Optometrist	A practitioner trained to examine eyes to detect defects in vision, signs of injury and ocular disorders, including those resulting from problems with general health, such as hypertension or diabetes. They make a health assessment, offer clinical advice, prescribe spectacles or contact lenses, and refer patients for further treatment, when necessary.
Orthodontics	The branch of dentistry concerned with preventing and correcting irregularities of the teeth, bite and jaw
Orthoptics	The examination and treatment by exercise of squints and other eye disorders
Periodontics	The branch of dentistry concerned with the study, diagnosis and integrated management of diseases of the structures surrounding and supporting the teeth
Periodontal Disease	An inflammatory disease that affects the gum and bone structures that support the teeth
Prosthodontics/ Prosthetics	The branch of dentistry concerned with the design, manufacture and fitting of artificial replacements for teeth and other parts of the mouth such as dentures
Radiograph	Image produced on a sensitive plate or film by X-rays, gamma rays or similar radiation, and typically used in medical examination
Restorative Dentistry	The branch of dentistry concerned with the study, diagnosis and integrated management of diseases of the oral cavity, the teeth and supporting structures

## **EXECUTIVE SUMMARY**

The Hippocrates Model provides estimates and projections of healthcare demand, capacity and expenditure for a range of Irish health and social care services. To allow for extension of the model to include dental and optical services, a broad service definition and data scoping exercise was necessary. It was concluded that data on the utilisation of the HSE Public Dental Service, HSE Dental Treatment Services Scheme, HSE Community Ophthalmic Service, Community Ophthalmic Services Scheme, Community Ophthalmic Services Medical Treatment Scheme and both the dental and optical elements of the Treatment Benefit Scheme are sufficiently detailed for inclusion in the model. Any data on the unmet demand for these services are not currently suitable to include but are presented here for illustrative purposes. No administrative data or suitable survey data on the utilisation of privately financed dental and optical services were identifiable.

## 1 INTRODUCTION

The first report from the Hippocrates Model provided baseline estimates and projections of public and private healthcare demand covering a range of Irish health and social care services for 2015–2030 (Wren et al., 2017). The model has since been developed to also provide projections of acute hospital capacity (Keegan et al., 2018) and expenditure (Brick and Keegan, 2020; Keegan et al., 2020). The model aims to add additional services as and when data availability allows. Two such areas of activity excluded from Wren et al. (2017) were dental and optical services. The aim of this report is to analyse the types of data available on dental and optical services in a community setting and consider how these might be incorporated into the Hippocrates Model. To this end, the report provides baseline estimates of service utilisation for 2018. An extensive service definition and data scoping exercise was necessary to establish the availability of data. Data gaps identified through this process are also highlighted.

The Hippocrates Model employs a macro-simulation (cell-based) approach to project demand for, and expenditure on, health and social care services. A macro-simulation approach was deemed most appropriate as it offers more flexibility than standard macro-level modelling yet may still be feasible with the considerable data constraints faced in the Irish system. In these models, individuals are grouped into cells according to age and sex, and expenditure is calculated by multiplying the number of individuals in a cell by the unit (or average) cost (Wren et al., 2017). Where possible, the model disaggregates demand and expenditure estimates for each healthcare service by age and sex (Wren et al., 2017) and aims to include both public and private activity and cost, dependent on data availability. The first step in the modelling is to estimate utilisation and demand at baseline. In the next step, healthcare demand is projected based on projected population growth, with sensitivity analyses varying assumptions about population growth, unmet need and demand, and healthy ageing. Projections of expenditure (Figure 1) are then developed by applying cost data to projected demand (Keegan et al., 2020).

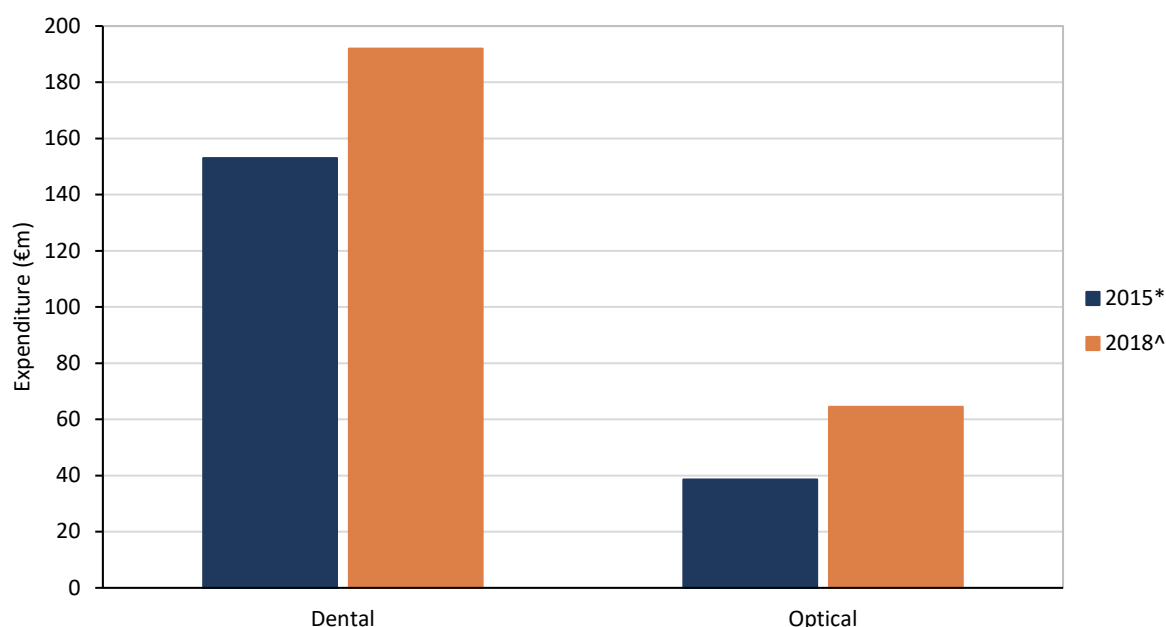
**FIGURE 1** Hippocrates Model



Source: Author representation of the Hippocrates Model.

Public expenditure on dental and optical services has been growing in recent years. Figure 2 presents expenditures specific to these two categories in 2015 and 2018. To give an indication of the scale of expenditure on these services, we can compare them to total public healthcare expenditure. In 2018, the Health Service Executive (HSE) gross non-capital vote allocation amounted to €16.3bn.<sup>1</sup> Primary care and community health, in which dental and optical expenditures are incorporated, accounted for 26 per cent of this figure or €4,203m (Department of Health, 2019a). Public dental and optical services combined accounted for approximately 6 per cent in 2018. A pronounced increase in overall dental and optical expenditure is observable across the schemes over the period. There was a 25.4 per cent increase in dental (€153m to €192m) and 67.3 per cent increase in optical expenditure (€39m to €65m). The increased spend is likely due to contemporaneous expansion of entitlements (discussed in more detail in subsequent sections).

**FIGURE 2** Public dental and optical expenditure by service, 2015 and 2018 (€m)



**Notes:** \* HSE Public Dental Service total for 2015, €70m, is an estimate (Nolan, 2019).  
 ^ HSE Public Dental Service total for 2018, €82.6m is an estimate provided by the HSE National Oral Health Office (personal communication, 7 January 2020).  
 Excludes private expenditure on dental and optical services.  
 Includes Dental Treatment Services Scheme; Dental Treatment Benefit Scheme; HSE Public Dental Service; Community Ophthalmic Services Scheme; Community Ophthalmic Services Medical Treatment Scheme; Optical Treatment Benefit Scheme.

**Sources:** HSE National Oral Health Office, HSE Primary Care Reimbursement Service and Department of Employment Affairs and Social Protection.

Section 2 provides an overview of the complex service delivery structures specific to dental and optical services in Ireland. Section 3 outlines the data available on these services. Section 4 describes the methods used to generate utilisation profiles for each service. Section 5 and 6 present detailed findings on service utilisation and utilisation rates for dental and optical services by age and sex. Section 7 summarises and concludes.

<sup>1</sup> In 2015 the Vote of the HSE was disestablished and the funding transferred to Vote 38 (Office of the Minister for Health) from which Vote grants are now paid to the HSE (Department of Health, 2019a).

## 2 CONTEXT

### 2.1 Policies on Dental Services

Prior to the publication of the new National Oral Health Policy ‘Smile agus Sláinte’ in early 2019 (Department of Health, 2019b), policy on the delivery of publicly financed dental services in Ireland was primarily informed by the 1994 Dental Health Action Plan (Department of Health, 1994a), which was part of the broader ‘Shaping A Healthier Future’ health strategy (Department of Health, 1994b; Nolan, 2019; Woods et al., 2017). Since then, general improvements in oral health status, coupled with a growing and ageing population, have altered the requirements for oral healthcare services. These changes have also served to highlight enduring inequalities in the oral health of vulnerable groups and the accessibility of services to such individuals. For these reasons, the National Oral Health Policy seeks to substantially reorientate services, with greater emphasis on prevention (Department of Health, 2019b).

The structure and eligibilities of these services and schemes have been described in detail elsewhere (Nolan, 2019; Woods et al., 2017) and are briefly outlined below along with an overview of privately financed services.

### 2.2 Dental Services Structures and Schemes

#### 2.2.1 HSE Public Dental Service (PDS)

The HSE Public Dental Service mainly provides emergency and routine care to children under the age of 16 years. It also provides care to all medical-card holders, although it is mainly used by vulnerable groups such as those with special and complex needs or those in a long-term residential care setting.<sup>2</sup> The service operates targeted clinical assessment of children in 2<sup>nd</sup>, 4<sup>th</sup> and 6<sup>th</sup> class, with onward referral for secondary care in an oral health or orthodontic context where necessary (see 2.2.2). Clinical assessment of vulnerable groups may be performed in training centres, daycare centres and in residential units, with any required follow-up treatment being performed in HSE clinics, provided this is the most appropriate location of care (Woods et al., 2017). Under this system, generally, the only publicly financed services provided to preschool children are emergency care and parental/carer education (Nolan, 2019; Woods et al., 2017). Currently, 95 per cent of the activity under the HSE Public Dental Service pertains to services provided to children, with the remaining 5 per cent of care largely going to patients in vulnerable groups.<sup>3</sup>

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<sup>2</sup> Services for other medical-card holders are provided, in general, by contracted dentists under the Dental Treatment Services Scheme (DTSS).

<sup>3</sup> HSE National Oral Health Office personal communication, 14 October 2019.

### 2.2.2 HSE Public Dental Services – Referral Services

Orthodontics, together with oral surgery and the medical speciality of oral and maxillofacial surgery, are defined by the National Oral Health Policy as ‘referral services’ (Department of Health, 2019b). In the case of orthodontics, referral is governed on the basis of clinical need assessed using a modified Index of Treatment Need (IOTN).<sup>4</sup> Those patients who require complex restorative or other advanced care are usually referred to either of the two dental hospitals in Ireland<sup>5</sup> or to independent practitioners providing more advanced forms of care (Department of Health, 2019b). Dental extractions under general anaesthesia are performed in general/regional hospitals such as Cork University Hospital and Our Lady’s Children’s Hospital, Crumlin.<sup>6</sup>

### 2.2.3 Dental Treatment Services Scheme (DTSS)

The objective of the DTSS, administered by the HSE Primary Care Reimbursement Service (PCRS) unit, is to improve the oral health of adult medical-card holders (Woods et al., 2017). Originally introduced on a phased basis, the scheme splits routine treatments covered into two groups:

- 1) ‘above the line’ treatments such as oral examinations, composite restorations, amalgam restorations and prophylaxis, which can be performed without requirement for prior approval (despite certain restrictions on treatment frequency – e.g. one oral examination per annum);
- 2) ‘below the line’ treatments, such as protracted periodontal treatment, that require prior approval.

The DTSS is principally delivered by self-employed dentists who have contracts with the PCRS and are reimbursed on a fee-per-item basis.

### 2.2.4 Dental Treatment Benefit Scheme (DTBS)

The DTBS, administered by the Department of Employment Affairs and Social Protection (DEASP), is available to employees aged 16 years or over, the self-employed, retired people and dependent spouses or partners who have the required number of pay-related social insurance (PRSI) contributions in an eligible PRSI class (Nolan, 2019). The quantity of contributions needed to be eligible depends on the individual’s age. Prior to 2010 the scheme entitled those eligible to an annual oral examination and two scale and polishes at no cost. A co-payment from the claimant was required for routine treatments.<sup>7</sup> Restrictions related to earnings were placed on more expansive treatments (Woods et al., 2017). The Irish

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<sup>4</sup> Internationally employed index used to identify individuals who would benefit from orthodontic treatment.

<sup>5</sup> Cork University Dental School and Hospital and Dublin Dental Hospital.

<sup>6</sup> Department of Health personal communication, 22 July 2020.

<sup>7</sup> The value of this co-payment varied considerably, from a fixed or a balance contribution to a 50 per cent co-contribution or the balance of the private clinic fees, less 15 per cent less DEASP fee. DEASP personal communication, 18 May 2020.

Government announced cuts to the DTBS in Budget 2010.<sup>8</sup> Budget 2017 partially reinstated some entitlements, including payments of €42 towards an annual scale & polish and periodontal treatment if clinically necessary. The recipient must pay the balance (capped at €15 for the scale & polish) (Citizens Information, 2019; Woods et al., 2017).

#### 2.2.5 Privately financed dental services

Limited coverage for dental care is included under some forms of private health insurance, typically subject to an excess or monetary cap (Woods et al., 2017). Health cash plans and outpatient-only plans may also provide cover for dental care.<sup>9</sup> Comprehensive dental care plans are available from both specialist dental and general health insurers (Woods et al., 2017). Patients may pay out-of-pocket for dental treatments, with 20 per cent tax relief available for certain non-routine procedures. According to the CSO System of Health Accounts, out-of-pocket payments for *dental practices* accounted for €351m with a further €26m attributed to voluntary healthcare payment schemes (Central Statistics Office, 2020).<sup>10</sup> Given the estimated €192m of public expenditure in 2018 (Figure 2), we approximate that almost two-thirds of total dental expenditure is privately financed.

Figure 3 provides an overview of dental service provision by scheme, including their respective eligibility criteria and the basket of treatments provided by each.

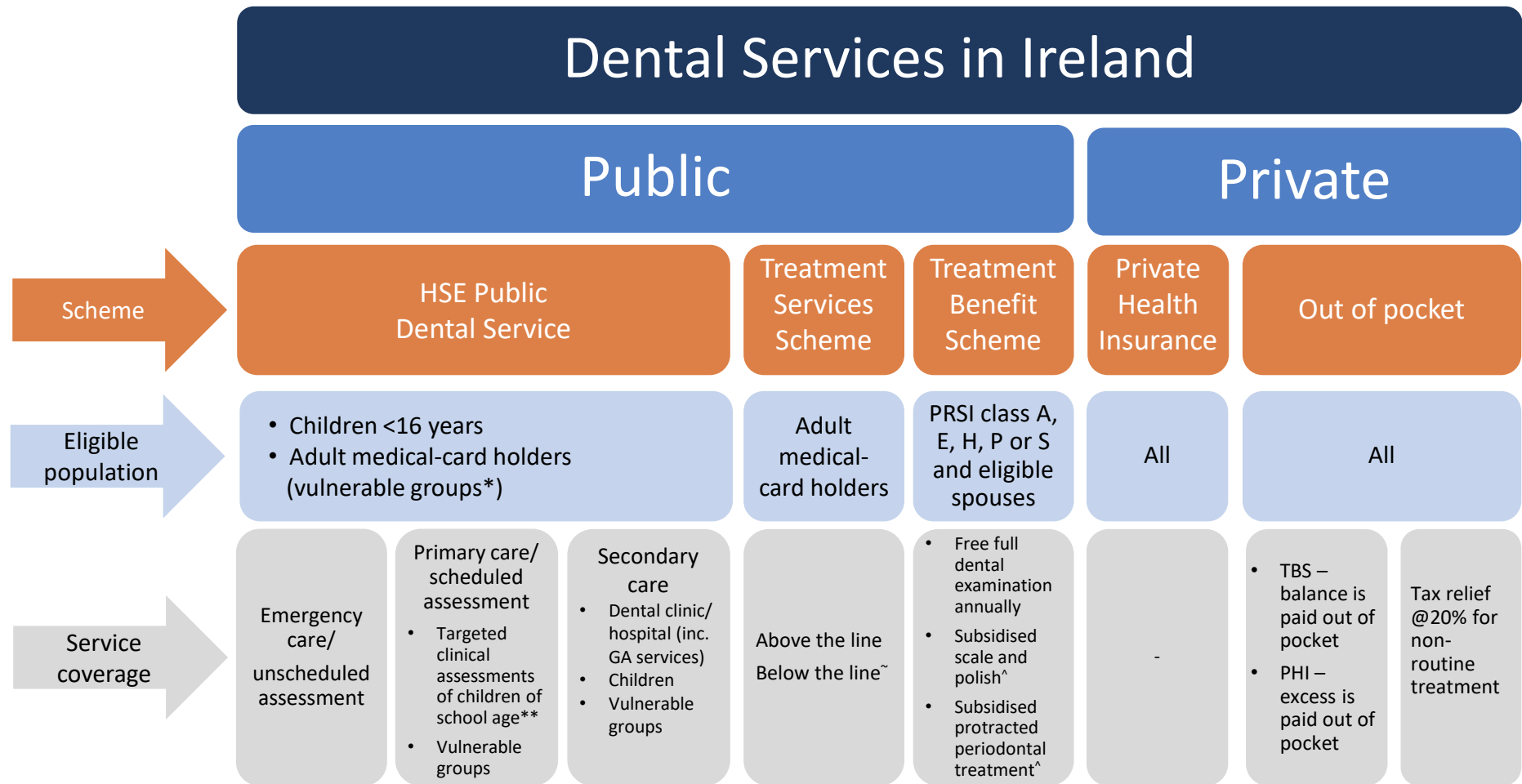
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<sup>8</sup> Published on 9 December 2009.

<sup>9</sup> Cash plans provide a fixed monetary amount for a range of medical costs (but do not cover hospital inpatient costs). Outpatient-only plans cover outpatient expenses, including emergency and non-emergency dental care, although the coverage varies by insurer and scheme. <https://www.hia.ie/comparison-tool/#/> [last accessed 11 May 2020]; <https://www.independent.ie/business/personal-finance/insuring-your-teeth-may-make-you-smile-30934461.html> [last accessed 26 November 2019].

<sup>10</sup> It is not currently possible to disaggregate the out-of-pocket payments into 'out-of-pocket excluding cost-sharing' and 'cost sharing with third-party payers'.

**FIGURE 3** Schematic overview of dental services provision in Ireland, 2018



**Notes:**

- \* 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.
- ^ Reinstated in 2017 (from 28 October).



### 2.3 Policies on Optical Services

Both the National Clinical Programme for Ophthalmology (NCPO) and Primary Care Eye Services Review Group (PCESRG) have indicated that changing demographics will affect the delivery of eye care services (Power et al., 2017; Primary Care Eye Services Review Group, 2017). As the incidence of visual loss and impairment increases with age, a bottleneck described in relation to in-patient ophthalmic procedures<sup>11</sup> is set to worsen under the current model of eye care. This, coupled with an expectation that services will be locally accessible and provided in a timely and safe manner, has highlighted the need for transition to a community-centred model, with greater integration with acute, secondary and tertiary care (Power et al., 2017; Primary Care Eye Services Review Group, 2017). As part of the reform process, both groups have undertaken a substantial review of the current provision of eye care services. The structure and eligibilities of these services and schemes are described briefly below, together with an overview of privately financed services.

### 2.4 Optical Services Structures and Schemes

#### 2.4.1 HSE Community Ophthalmic Service (COS)

A primary-care eye service is provided directly by the HSE through which salaried community ophthalmic teams, under the direction of community ophthalmic physicians,<sup>12</sup> primarily provide services to children referred from vision surveillance and screening, as well as to adult medical-card holders. Most of the care is delivered in local primary-care clinics and includes detailed assessment, diagnosis and treatment of eye conditions, provision of prescriptions for glasses, and provision of laser treatment and minor surgery (Primary Care Eye Services Review Group, 2017).

#### 2.4.2 Community Ophthalmic Services Scheme (COSS)

The COSS is a national fee-per-item service scheme delivered by optometrists, dispensing opticians, community ophthalmic physicians and ophthalmologists. The scheme is authorised by Local Health Offices and primarily financed through the PCRS, with services provided on a contract basis (Primary Care Eye Services Review Group, 2017). Medical-card holders aged over 16 years are entitled to an eye examination (unless more frequent exams are deemed clinically necessary) and spectacles every two years. Teenagers aged 12–16 years, who are dependants of medical-card holders or medical-card holders in their own right are also eligible. Eye examinations for children under the age of 12 are normally carried out by a community ophthalmologist under the School Medical Scheme. The COSS does,

<sup>11</sup> ‘... there is a significant bottleneck for ophthalmic patients who have been diagnosed as requiring in-patient procedures in getting those procedures carried out’ (National Clinical Programme for Ophthalmology – Model of Eye Care, 2017).

<sup>12</sup> In the report of the PCESRG, many community ophthalmic physicians were described as working in isolation, as single practitioners, in under-resourced clinics with inadequate diagnostic equipment (Primary Care Eye Services Review Group, 2017).

however, provide for dispensing of spectacles and optical devices<sup>13</sup> to children by optometrists and dispensing opticians (PCRS, 2017).

#### 2.4.3 Community Ophthalmic Services Medical Treatment Scheme (COSMTS)

First piloted in 2004 in response to an identified need, and still available as such, the COSMTS provides secondary care (medical and minor surgical treatment) delivered by an ophthalmologist, to adult medical-card holders, in a primary-care setting in counties Cork, Dublin, Kildare and the Midlands. Referrals are received from optometrists and GPs (Primary Care Eye Services Review Group, 2017).

#### 2.4.4 Ophthalmic Treatment Benefit Scheme (OTBS)

The OTBS, administered by the DEASP, is open to employees aged 16 years and over, the self-employed, retired people and dependent spouses or partners with the required number of PRSI contributions in an eligible PRSI class. Qualifying persons are entitled to free eye examinations every two years unless greater frequency is deemed clinically necessary. The Budget 2010 cuts also extended to all aspects of the OTBS except for a free biennial optical exam. Since reinstatement of entitlements in 2017, those eligible can avail of a payment towards reading and distance spectacles, bifocal or varifocals or one pair of contact lenses. Basic frames are free, with the DEASP paying €42 towards the cost of more expensive frames. Repairs to frames and lenses are also covered by the scheme, as is a payment of €500 for contact lenses required on medical grounds.<sup>14</sup>

#### 2.4.5 Other public services

Paediatric vision screening is carried out in schools. All school going children are vision-screened in Junior Infants by public health nurses.<sup>15</sup> If an abnormality is detected, the child is referred to the Community Ophthalmic Physician or local multidisciplinary ophthalmic care team. Diabetic retinopathy screening, delivered as part of the HSE National Screening Service,<sup>16</sup> is outside the scope of this analysis.

#### 2.4.6 Privately financed optical services

Some private health insurance policies include coverage for optical services.<sup>17</sup> Health cash plans and outpatient-only plans may also incorporate an optical category. Those paying out-of-pocket for optical services can claim tax relief at a standard rate of 20 per cent for prescribed orthoptic or similar treatments.

Figure 4 provides a summary of optical services in Ireland, incorporating eligibilities specific to each service/scheme.

<sup>13</sup> Prescribed by an ophthalmologist.

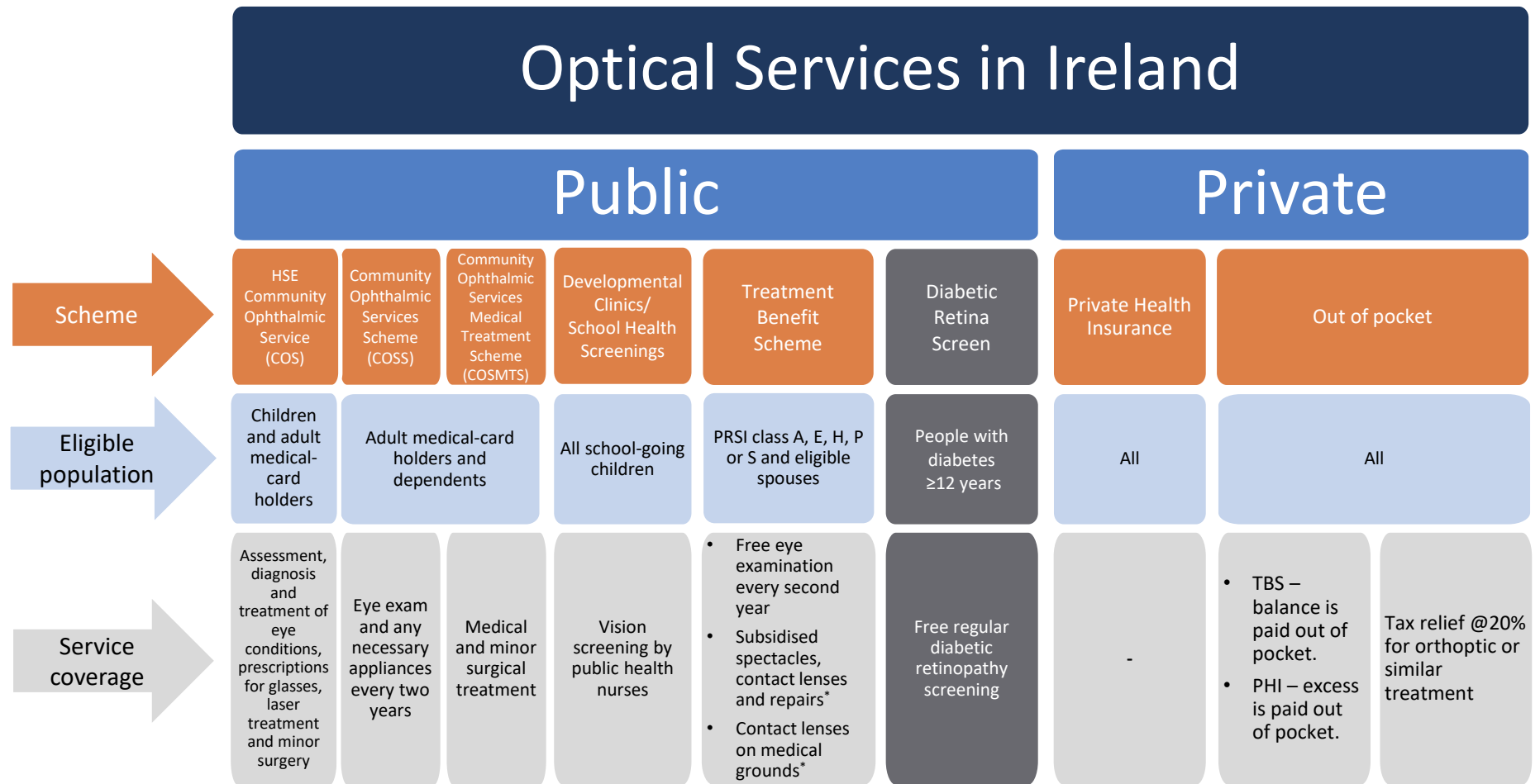
<sup>14</sup> <https://www.gov.ie/en/service/1fb655-treatment-benefit-scheme/> [last accessed 4 March 2020].

<sup>15</sup> HSE Office of the Nursing and Midwifery Services Director personal communication, 25 November 2019.

<sup>16</sup> <http://www.diabeticretinascreen.ie/> [last accessed 4 March 2020].

<sup>17</sup> <https://www.hia.ie/comparison-tool/#/> [last accessed 16 April 2020].

**FIGURE 4** Schematic overview of optical services provision in Ireland, 2018



Note: \* Reinstated in 2017 (from 28 October).

### 3 DATA SOURCES

This report draws on several data sources to establish baseline utilisation of public dental and optical services in 2018.<sup>18</sup> As described in the context section above, eligibilities vary across specific population cohorts. Accordingly, a combination of data sources is required to estimate an accurate baseline profile of utilisation for projection. Each source is discussed in the subsections that follow. The nature of the data and proposed ways to incorporate these services into the Hippocrates Model will also be outlined.

#### 3.1 Dental Services

##### 3.1.1 HSE Public Dental Services

###### *Utilisation*

Following nationwide rollout of the HSE National Dental Record and Information System, fully digitised dental treatment records have been in use since March 2019.<sup>19</sup> The number of scheduled and unscheduled attended appointments were provided by the HSE National Oral Health Office (NOHO), using the associated reporting tool. The attended appointment totals are disaggregated by single year of age and sex up to 16 years.<sup>20</sup> Since national coverage of the system was not achieved until March 2019, it was necessary to calculate the rate of attended appointments using the number of attended appointments in 2019,<sup>21</sup> together with corresponding age- and sex-specific ESRI population estimates. Application of these rates to the 2018 population in each age and sex cohort allows for estimation of the number of appointments in that cohort.<sup>22</sup>

###### *Unmet demand*

As per the metric for unmet demand employed for physiotherapy and occupational therapy services in the first report from the Hippocrates Model (Wren et al., 2017), the percentage of patients waiting more than 12 weeks for active care in December of 2018 is also employed here. These administrative data, published routinely by the HSE Business Information Unit Community Healthcare (BIU), contain no age- or sex- specific disaggregation.

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<sup>18</sup> Currently, no suitable data on the provision of private dental and optical services are available.

<sup>19</sup> <https://www.hse.ie/eng/about/our-health-service/making-it-better/new-national-dental-it-system-improves-patient-care.html> [last accessed 4 March 2020].

<sup>20</sup> Current data on the 5 per cent (approximate) of HSE PDS activity pertaining to individuals aged 16 years or older are not disaggregated by age and have been omitted from the analysis on this basis. We hope to incorporate more granular versions of these data in future iterations of the model.

<sup>21</sup> Based on the mean number of attended appointments derived from the total attended appointments recorded in quarters 2, 3 and 4 and assuming no seasonality or deviation from this average in quarter 1.

<sup>22</sup> We did not have access to data on the activity of either of the two aforementioned dental hospitals.

### 3.1.2 HSE Public Dental Services – Orthodontic Referrals

Efforts to progress to full digitisation of orthodontic records are ongoing.<sup>23</sup> However, following consultation with HSE NOHO, it has been decided to omit any administrative data on the utilisation of HSE Orthodontic Services from the model until comprehensive audit and validation has been carried out. The use of alternative data from survey sources such as Growing Up in Ireland or the Household Budget Survey were considered, but the wording of any related questions did not allow for differentiation of the specific utilisation of the HSE Orthodontic Services from general engagement with orthodontic services.

### 3.1.3 Dental Treatment Services Scheme

The HSE PCRS collect data on all ‘above the line’ and ‘below the line’ treatments carried out within the remit of the DTSS. Data on all treatment items are disaggregated into eight age categories (no disaggregation by sex available).<sup>24</sup>

### 3.1.4 Dental Treatment Benefit Scheme

#### *Utilisation*

Data on all treatments and activities claimed for by DTBS-eligible individuals are collated by the DEASP. These data are disaggregated by single year of age and sex.

#### *Unmet demand*

Since Treatment Benefit is a prior approval scheme, the clinician checks eligibility for treatment before they treat and submit a claim. Age-specific non-approved eligibility checks<sup>25</sup> are employed as a metric of unmet demand.

### 3.1.5 Privately financed dental services

There are no centrally held administrative data on the utilisation of privately financed dental services.<sup>26</sup> Only data on private dental service expenditure were identifiable. In survey sources, there is a limited number of questions specifically on the utilisation of privately financed dental services (i.e. questions in The Irish Longitudinal Study on Ageing Wave 4 questionnaire). However, since these are only applicable to a subgroup of the population, these data have not been employed in the analysis.<sup>27</sup> Accordingly, privately financed dental services will be

<sup>23</sup> HSE NOHO personal communication, 11 February 2020.

<sup>24</sup> DTSS utilisation age cohorts: 16–24, 25–34, 35–44, 45–54, 55–64, 65–69, 70–74, 75+.

<sup>25</sup> Claims are usually non-approved due to the claimant having insufficient PRSI contributions either in total or in the relevant governing tax year (Governing Contribution Year: GCY). Department of Employment Affairs and Social Protection personal communication, 26 February 2020.

<sup>26</sup> As confirmed by personal communication with the Irish Dental Association, 12 December 2019.

<sup>27</sup> Relevant questions in the Healthy Ireland and Growing Up in Ireland surveys were also identified but these did not allow for sufficient differentiation between public and private-service utilisation.

excluded from the Hippocrates Model until there are improvements in the available data.

## 3.2 Optical Services

### 3.2.1 HSE Community Ophthalmic Service

#### *Utilisation*

The total number of HSE Community Ophthalmic Service attended appointments in each month in 2018 were provided by the HSE BIU. The total number of attended appointments is the sum of two metrics; the ‘number of existing Ophthalmology patients offered an appointment and seen’ and the ‘number of new Ophthalmology patients offered first appointment and seen’. While there is no sex disaggregation, the data are provided for four age cohorts.<sup>28</sup>

#### *Unmet demand*

Again, in keeping with unmet demand metrics pertaining to other community therapy services (Wren et al., 2017), we employ data from the HSE BIU to calculate the proportion of ophthalmology patients waiting for longer than 12 weeks for treatment to be carried out under the remit of the HSE Community Ophthalmology Service, as of December 2018. Only data on the activities of members of salaried community ophthalmic teams under the clinical governance of community ophthalmic physicians are captured.<sup>29</sup> The numbers waiting are disaggregated into four age cohorts.<sup>30</sup>

### 3.2.2 Community Ophthalmic Services Scheme and Community Ophthalmic Services Medical Treatment Scheme

Data on activity and treatments of both elements of the COSS and COSMTS schemes are made publicly available by HSE PCRS. While a wide range of treatments and activity are captured, age disaggregation is limited to three groupings,<sup>31</sup> with no disaggregation by sex.<sup>32</sup>

<sup>28</sup> COS utilisation age cohorts: 0–4, 5–17, 18–64, and 65+ years.

<sup>29</sup> Activities of contractors not reported. HSE personal communication, 17 April 2020.

<sup>30</sup> COSS/COSMTS unmet demand age cohorts: 0–4, 5–17, 18–64, 65+.

<sup>31</sup> COSS/COSMTS utilisation age cohorts: Child = 0–12, Teen = 13–15, Adult = 16+.

<sup>32</sup> HSE PCRS also collect data on COSS and COSMTS utilisation by Health Amendment Act (HAA) card-holders, those persons infected with Hepatitis C via contaminated blood and blood products.

### 3.2.3 Optical Treatment Benefit Scheme

#### *Utilisation*

As per data related to utilisation of DTBS (Section 3.1.4).

#### *Unmet demand*

As per data pertaining to unmet demand for DTBS (Section 3.1.4).

### 3.2.4 Paediatric vision screening (as part of school-based developmental clinics)

While there are currently no national returns on the activity of public health nurses, draft metrics are being evaluated, with a plan for introduction in 2020.<sup>33</sup> Once the data environment improves, these data can be considered for incorporation in subsequent iterations of the Hippocrates Model.

### 3.2.5 Privately financed optical services

There is a marked lack of data relating to provision of privately financed optical services.<sup>34</sup> There are questions in survey sources on the utilisation of privately financed optical services (i.e. questions in The Irish Longitudinal Study on Ageing Wave 4 questionnaire) but, again, these are only applicable to a subgroup of the population and were not used in the analysis. Taken together, these factors have prompted us to exclude privately financed optical services from the Hippocrates Model until the data environment improves.

## 4 METHODS

The methods used in establishing the baseline data for dental and optical services vary across the considered services and schemes due to the deviations in data availability and quality (see Section 3). Utilisation profiles by age and sex for each specific dental and optical service/scheme are, therefore, calculated separately. Utilisation rates per 1,000 population are calculated using ESRI population estimates for 2018, for all dental and optical services to be included in the model. Table 1 summarises the services for which baseline utilisation and unmet demand data are available, the data sources specific to each, and whether it will be possible to include them in Hippocrates. The level of disaggregation of data specific to each service/scheme is also indicated.

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<sup>33</sup> HSE personal communication, 25 November 2019.

<sup>34</sup> Attempts were made to obtain data from professional representative bodies and larger optical retailers.

**TABLE 1** Baseline utilisation and unmet demand: service data sources

Service	Data source	Dataset type	Metric	Disaggregation level	Hippocrates inclusion
<b>Dental</b>					
<b>Utilisation</b>					
HSE PDS	HSE NOHO	Administrative	Attended appointments	SYOA & sex	Yes
DTSS	PCRS	Administrative	Activity/treatments	8 age categories	Yes
DTBS	DEASP	Administrative	Activity/treatments	SYOA & sex	Yes
<b>Unmet demand</b>					
DTBS	DEASP	Administrative	Non-approved claims	SYOA & sex	No
HSE PDS	HSE BIU	Administrative	% waiting > 12 weeks	No disaggregation by age or sex	No
<b>Optical</b>					
<b>Utilisation</b>					
HSE COS	HSE BIU	Administrative	Attended appointments	4 age categories	Yes
COSS/COSMTS	PCRS	Administrative	Activity/treatments	3 age categories	Yes
OTBS	DEASP	Administrative	Activity/treatments	SYOA & sex	Yes
<b>Unmet demand</b>					
HSE COS	HSE BIU	Administrative	% waiting > 12 weeks	4 age categories	No
OTBS	DEASP	Administrative	Non-approved claims	SYOA & sex	No

Data on unmet demand for the HSE Public Dental Service, and optical and dental elements of the TBS and the HSE Community Ophthalmic Service are omitted from the current iteration of the model. The HSE Public Dental Service and Community Ophthalmic Service unmet demand data are at the patient level (i.e. proportion of patients waiting for longer than 12 weeks for treatment) whereas the utilisation metrics for the same services are at the activity level (i.e. attended appointments and referrals and visits respectively). The TBS unmet demand data are omitted due to the potential for duplication of eligibility checks for individual claimants who could have been checked twice on separate occasions, for optical and dental, or at different times of the year.<sup>35</sup> Although these unmet demand data are omitted from the model, there is value in presenting applicable findings for illustrative purposes. In addition to the baseline utilisation profile by age and sex, supplementary analyses of dental services are undertaken in Section 5; namely, the rate of DTSS activity/treatment per eligible population. Given the constraints of the optical service data, such analyses were not undertaken in relation to optical services.

## 5 BASELINE ESTIMATES OF SERVICE UTILISATION

### 5.1 Dental Services

#### 5.1.1 HSE Public Dental Services

##### *Utilisation*

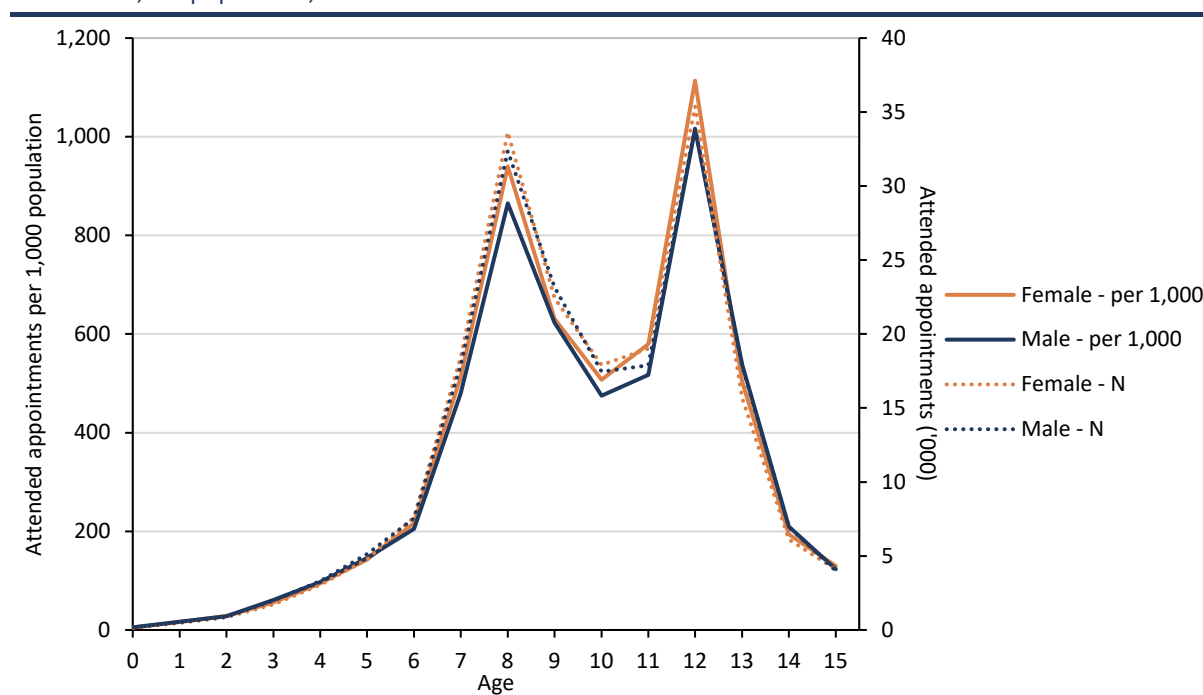
In 2018, an estimated 382,374 of the 406,745 (94.0 per cent) scheduled and unscheduled appointments that were attended pertained to individuals under 16 years of age. Attendances were split relatively evenly between sexes. A similar pattern of service engagement is observable across the age spectrum; there are

<sup>35</sup> Department of Employment Affairs and Social Protection personal communication, 23 January 2020.



only small differences in sex-specific rates of attendance observed (Figure 5).<sup>36</sup> The differential is greatest between the ages of eight and 12, where the rate of attendance is slightly higher among females than males. More generally, rates of attended appointments are lowest in those aged under six, consistent with evidence described in the National Oral Health Policy, that children in this age group only have access to emergency dental services (Department of Health, 2019b). Thereafter, peaks in attendance rates occur at ages eight and 12, coinciding with targeted clinical assessments in 2<sup>nd</sup> and 6<sup>th</sup> class.<sup>37</sup>

**FIGURE 5** HSE PDS: age- and sex-specific number of attended appointments and attended appointments per 1,000 population, 2018



Source: HSE NOHO.

### *Unmet demand*

In December 2018, 7,869 oral health patients were waiting for active care following a scheduled assessment. Of this total, 9.7 per cent (760 patients) had been waiting longer than three months. This represents a rate of 0.16 patients per 1,000 population. As mentioned previously, these data are to be excluded from the Hippocrates Model as they are at the patient level while data on HSE Public Dental Service utilisation are at the activity level.

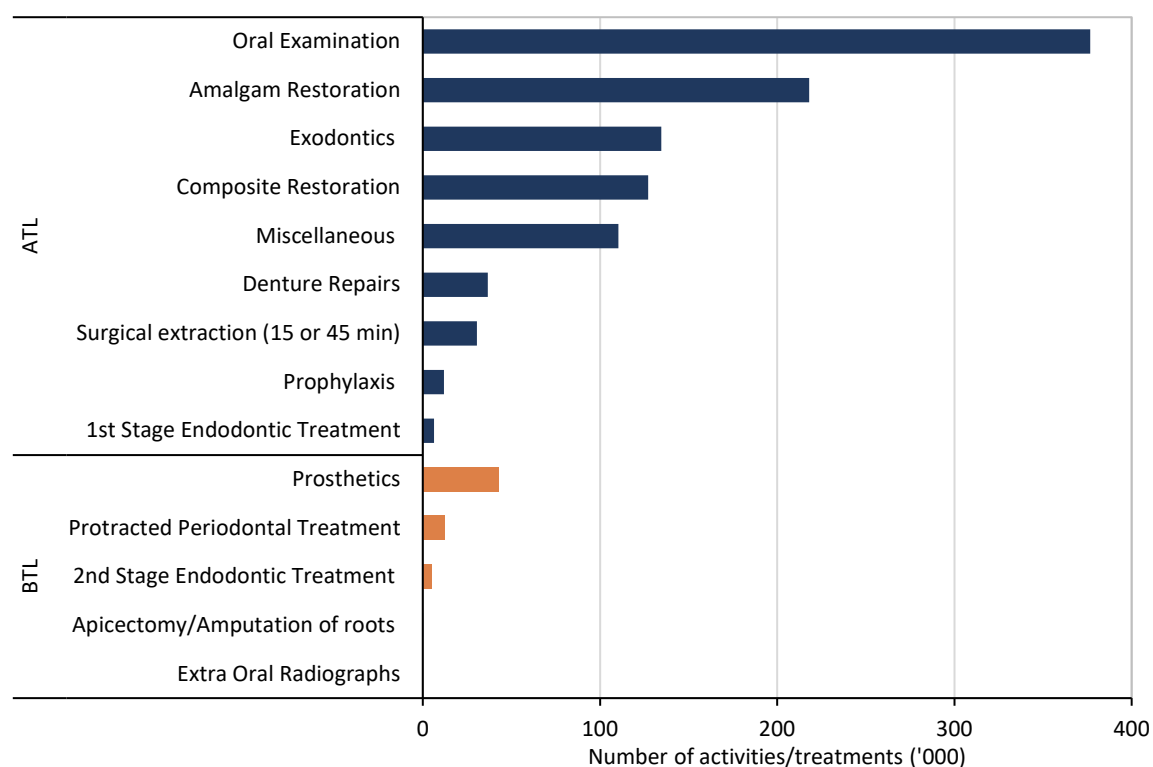
<sup>36</sup> Similar sex-specific rates of attendance are to be expected, given the universal nature of eligibility for HSE Public Dental Services up to 16 years.

<sup>37</sup> The mean (SD) duration of an appointment was 24.4 mins (3.04 mins), with little variation in duration of appointment by age and sex.

### 5.1.2 Dental Treatment Services Scheme

In total, 1,112,826 claims for activities/treatments were approved for reimbursement by the PCRS in 2018. As Figure 6 shows, the majority of these claims related to 'above the line' procedures – 1,052,246 claims (94.6 per cent). Oral examinations were most frequently claimed for (376,675 claims, 33.8 per cent), followed by amalgam restorations (218,042 claims, 19.6 per cent). Oral examinations were most frequently claimed for (376,675 claims, 33.8 per cent), followed by amalgam restorations (218,042 claims, 19.6 per cent).

**FIGURE 6** DTSS – number of activity/treatment claims, 2018

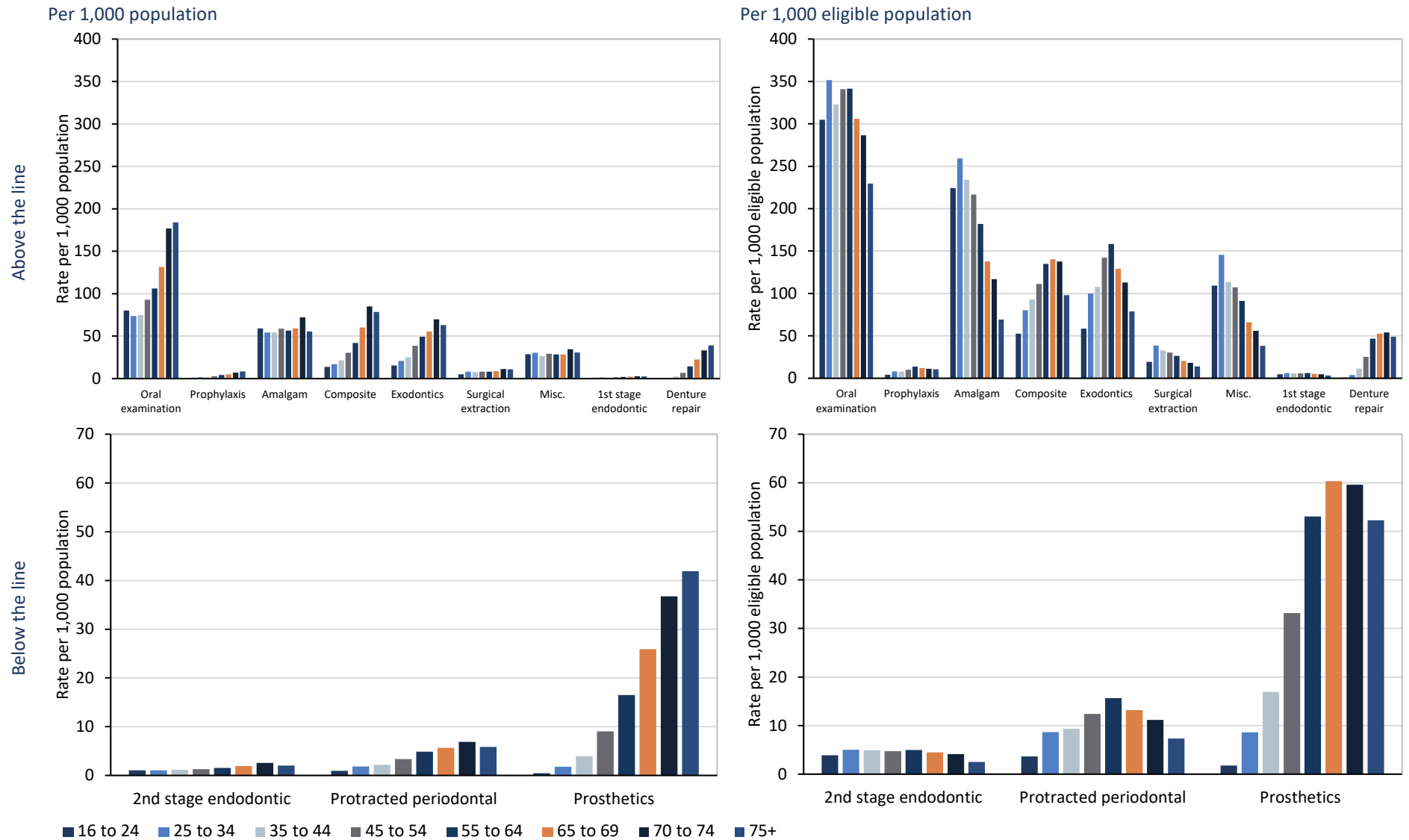


*Note:* Miscellaneous includes treatments for haemorrhage, dry socket and abscess, as well as dressings and prescriptions. ATL, above the line; BTL, below the line; DTSS, Dental Treatment Services Scheme.

*Source:* HSE PCRS.

Figure 7 shows the rate per 1,000 population of claims particular to activities and treatments reimbursable under the remit of the DTSS. In available age groups, higher activity/treatment rates are observable in older age categories, markedly so in the 70–74 and 75+ cohorts. This pattern is especially evident in relation to oral examinations, composite restorations, exodontics (extractions), dental repairs, and prosthetics. As shown by the change in this pattern when rates are calculated on the basis of the population eligible for a medical card (Health Service Executive, 2018), the higher activity/treatment rates in older age categories are assumed, at least in part, to be attributable to higher levels of eligibility in those cohorts.

**FIGURE 7** DTSS – activities/treatments rate per 1,000 population and rate per 1,000 eligible population by age group, 2018



**Notes:** Miscellaneous includes treatments for haemorrhage, dry socket and abscess, as well as dressings and prescriptions. Age-specific eligible population not identifiable for 2018. Applicable age-specific proportions from PCRS Statistical Analysis of Claims and Payments 2017 applied to total number of medical-card holders in 2018. Miscellaneous includes treatments for haemorrhage, dry socket and abscess, as well as dressings and prescriptions. Below-the-line treatments of Apicectomy/Root Amputation and Extra Oral Radiographs not shown due to very small numbers of claims or no claims being approved across all age categories.

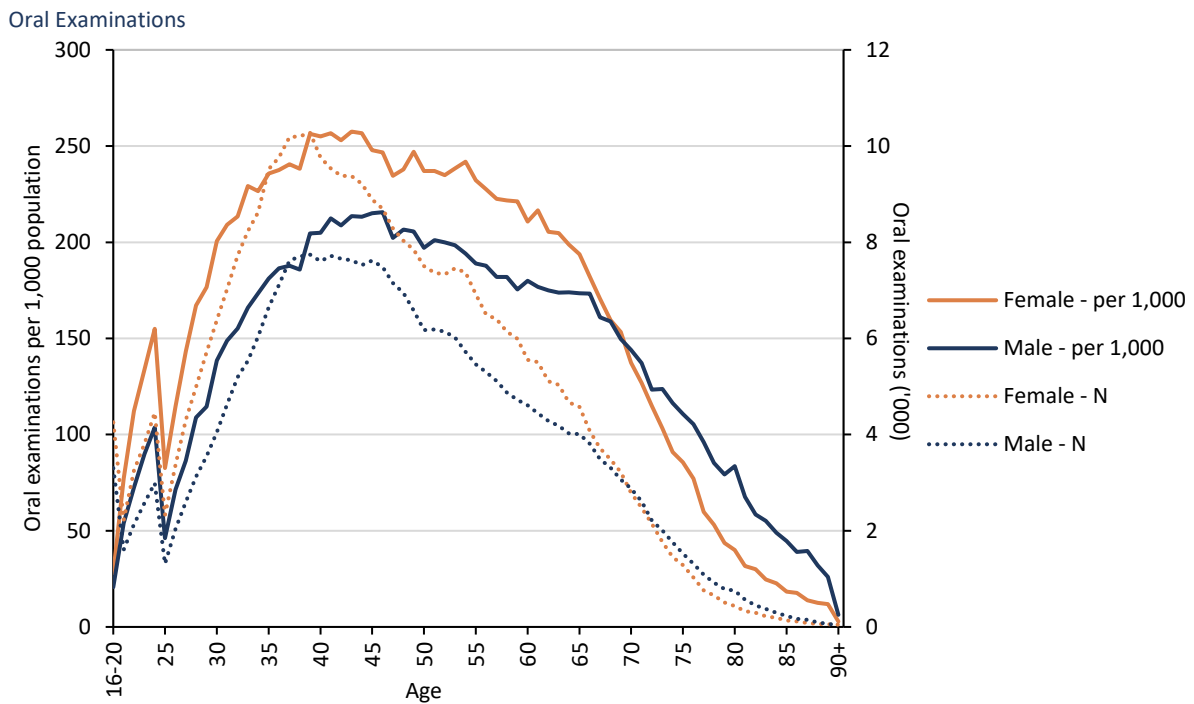
**Source:** HSE PCRS.

5.1.3 Dental Treatment Benefit Scheme

*Utilisation*

In 2018, 1,244,935 DTBS claims for oral examinations, scale & polish and periodontal treatments were approved for reimbursement by the DEASP. Of these, oral examinations accounted for 623,187 claims (50.1%), scale & polish claims tallied to 547,877 (44.0%), with the remainder (73,871 approved claims, 5.9%) for periodontal treatments. Figure 8 shows how the number of DTBS activities/treatments and the activity/treatment rate per 1,000 population vary by age and sex. A similar pattern of utilisation is observable across all three activity/treatment types, where utilisation peaks between the age of 35 and 45. Higher utilisation by females than males is evident in younger age categories, up to approximately 70 years of age, with male utilisation equal or slightly higher thereafter.

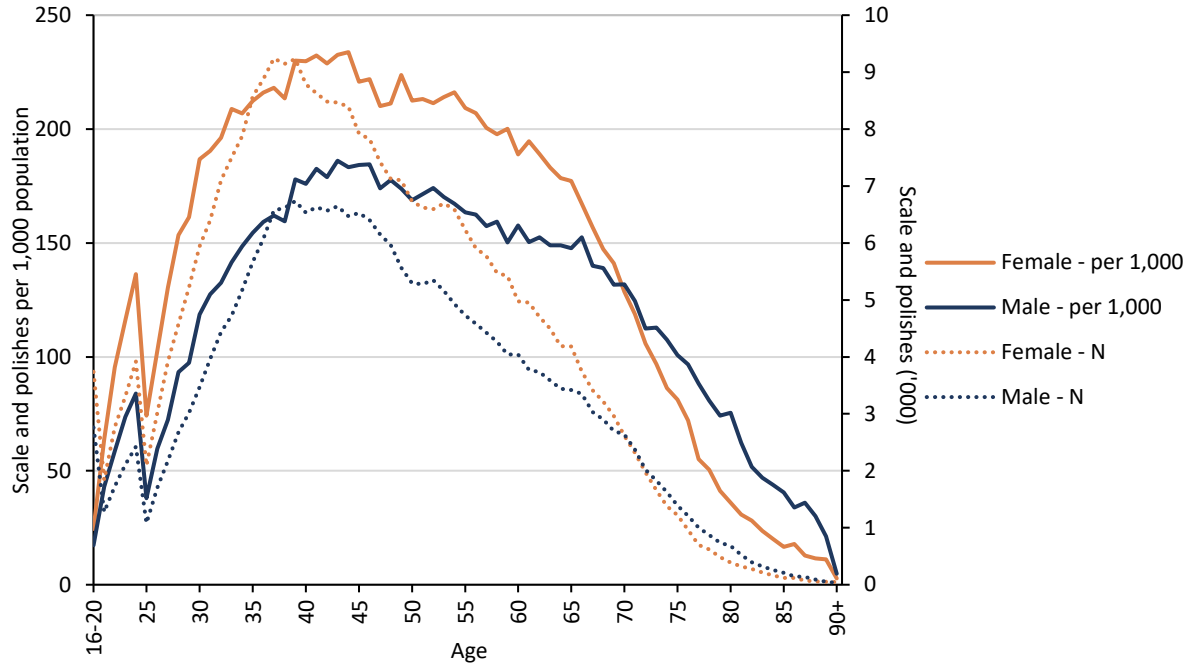
**FIGURE 8** DTBS – age- and sex-specific number of activities/treatments and activities/treatments per 1,000 population, 2018



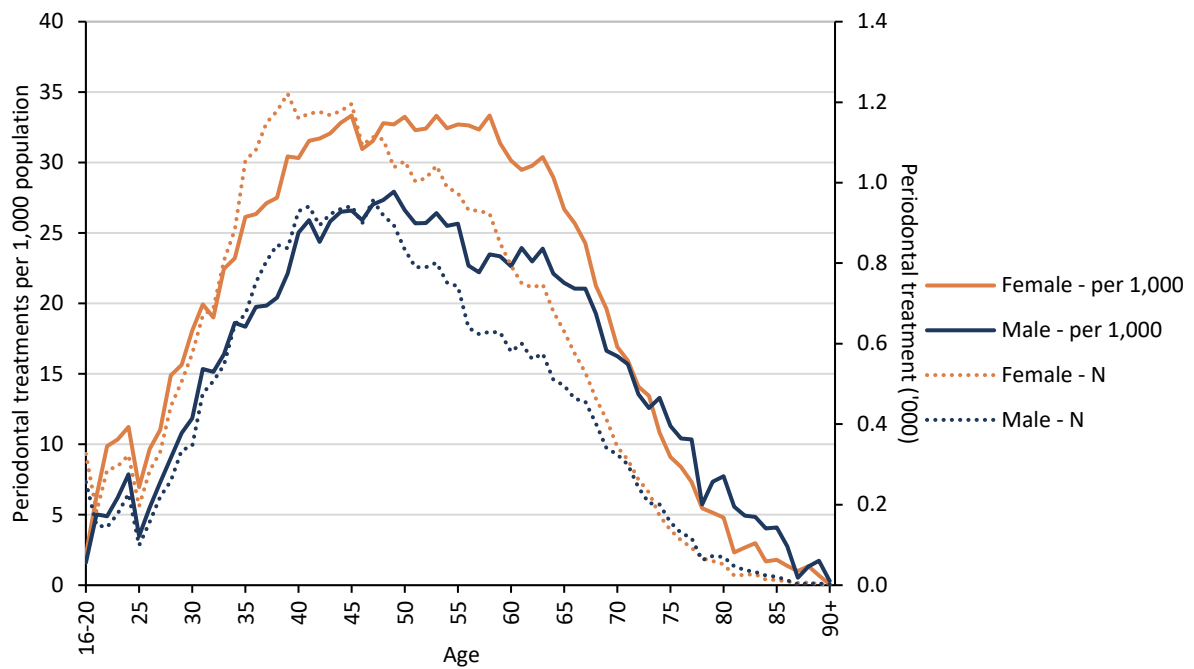
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FIGURE 8 Continued

Scale and polishes



Periodontal treatment

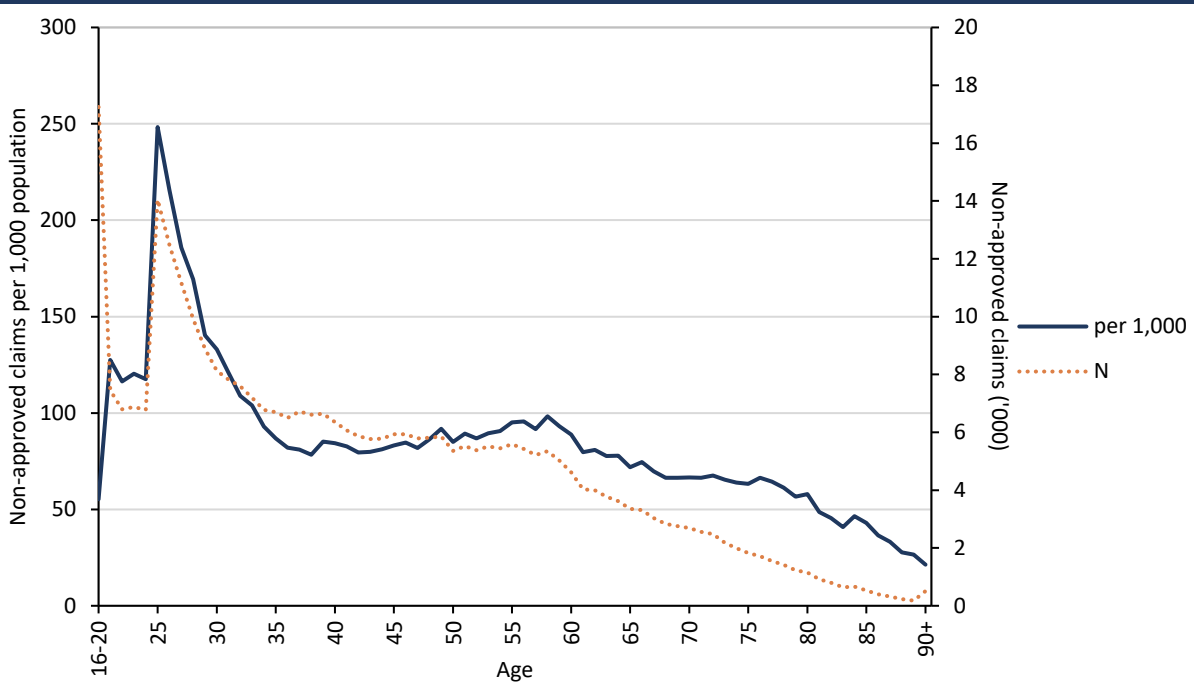


Source: DEASP.

*Unmet demand*

Figure 9 shows how the number and rate per 1,000 population of non-approved claims for treatments covered by the DTBS fluctuate across the age spectrum. A total of 346,499 DTBS claims went unapproved in 2018, accounting for 27.5 per cent of total claims submitted. The highest rate of non-approved claims was in relation to individuals aged between 25 and 30. The non-approval rate declines steadily thereafter. These data are to be excluded from the Hippocrates Model due to the potential for duplication of eligibility checks for individual claimants.

**FIGURE 9** DTBS – age-specific number of non-approved claims and non-approved claims per 1,000 population, 2018



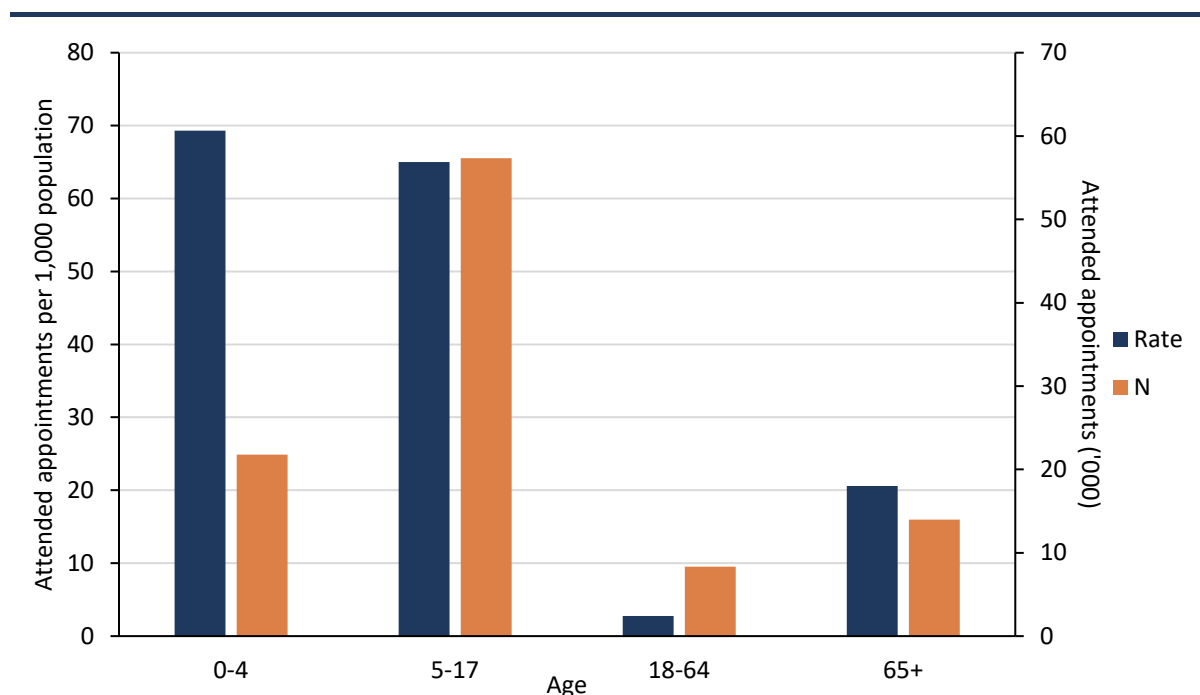
Source: DEASP.

## 5.2 Optical Services

### 5.2.1 HSE Community Ophthalmic Service

Figure 10 illustrates the number of HSE Community Ophthalmic Service attended appointments and the attended appointment rate per 1,000 population. Overall, there were 101,405 attended appointments in 2018.<sup>38</sup> The highest number of attended appointments was observed in the 5–17 years age group (56.7%). The attendance rates were highest among those four years or younger (69.3 per 1,000 population), decreasing slightly in the 5–17 years age group (65.0 per 1,000 population) and decreasing substantially thereafter (2.8 per 1,000 population in the 18–64 years group and 20.6 per 1,000 in the 65 years and older group). The observed reduction in the attended appointment rates in the 18–64 and 65+ groups may have occurred because eligible adults would likely have been seen by COSS contracted optometrists unless referred to HSE Community Ophthalmic Services for assessment, diagnosis and treatment of a particular eye condition.<sup>39</sup>

**FIGURE 10** HSE COS – age-specific attended appointments and attended appointments per 1,000 population, 2018



*Note:* Number of attended appointments includes the 'number of existing Ophthalmology patients offered an appointment and seen' and the 'number of new Ophthalmology patients offered first appointment and seen'.

*Source:* HSE BIU.

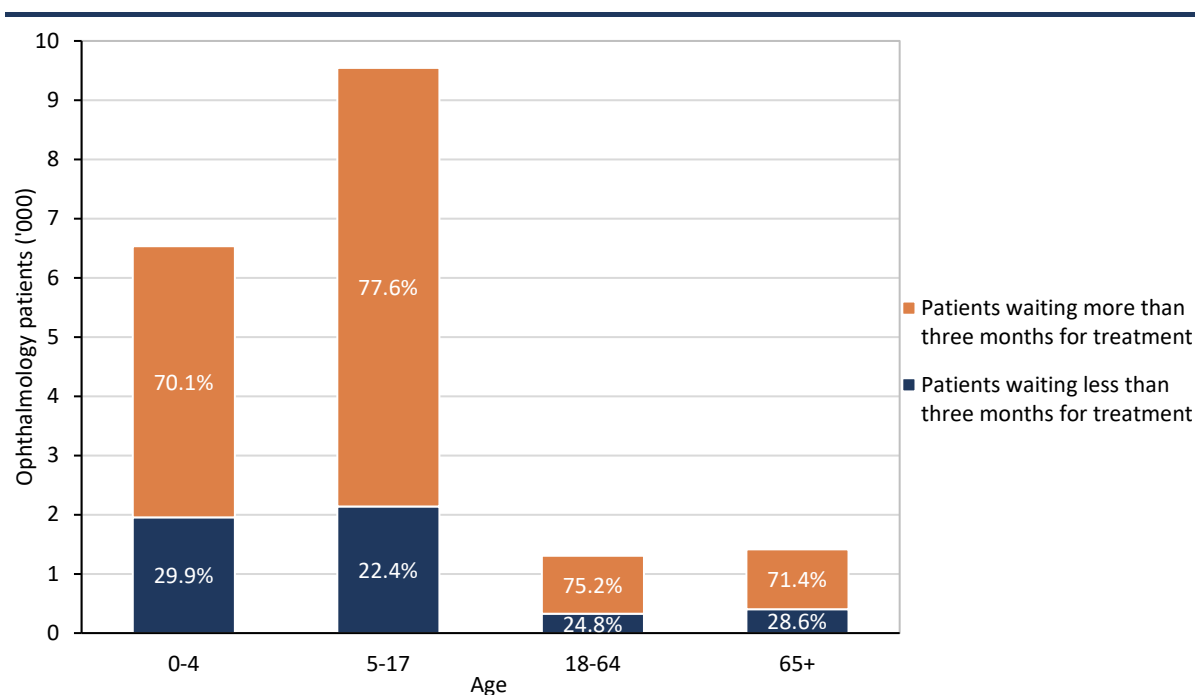
<sup>38</sup> Number of attended appointments includes the 'number of existing Ophthalmology patients offered an appointment and seen' and the 'number of new Ophthalmology patients offered first appointment and seen'.

<sup>39</sup> Department of Health personal communication, 22 July 2020.

### Unmet demand

The greatest number of ophthalmology patients waiting more than three months for treatment in December 2018 were in the 5–17-year age group – i.e. 7,406 patients or 70.1 per cent of this overall age group (Figure 11). A total of 4,582 patients (70.1%) in the 0–4 years age cohort waited longer than three months for treatment. While the total number of patients in the two older age categories was lower, the proportion waiting longer than three months for treatment was comparable (75.2% [983 patients] and 71.4% [1,010 patients] in the 18–64 and 65 years and over age groups respectively). These data are to be excluded from the Hippocrates Model as they only relate to a subgroup of service users and are at the patient level, while other service utilisation metrics are at the activity level.

**FIGURE 11** HSE COS – number and proportion of ophthalmology patients waiting more than three months for treatment in December 2018



Source: HSE BIU.

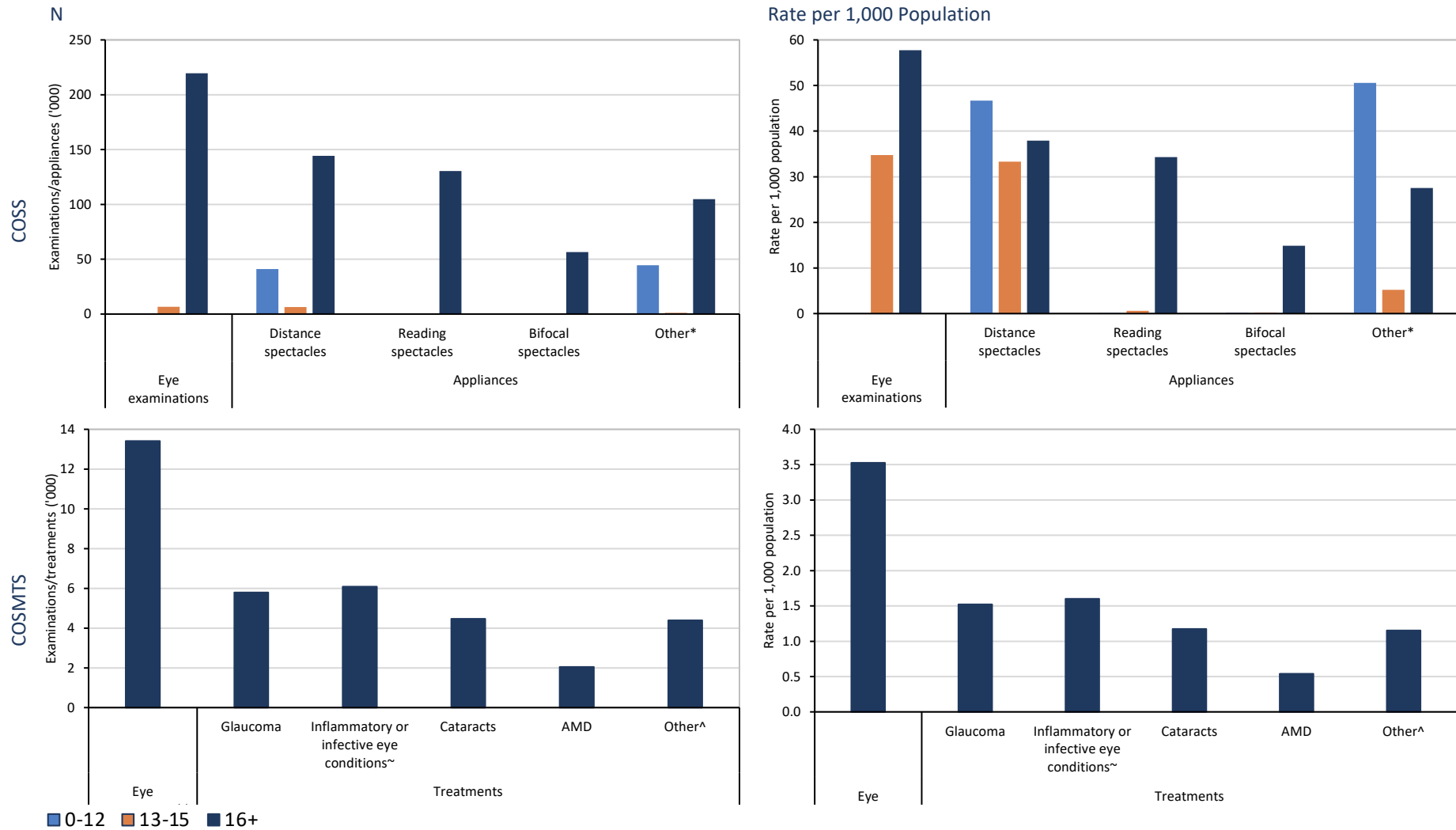
### 5.2.2 Community Ophthalmic Services Scheme and Community Ophthalmic Services Medical Treatment Scheme

The HSE financed 793,248 COSS and COSMTS activities/treatments in 2018.<sup>40</sup> Presented in Figure 12 is the number and rate per 1,000 population related to each treatment or activity, in each of the available age groups, of the COSS and COSMTS. With the exception of distance spectacles and plastic lenses for children (incorporated in the 'other' category), the highest rate of utilisation is seen in those 16 years and over.

<sup>40</sup> Including 1,409 treatments for HAA card-holders.



**FIGURE 12** COSS and COSMTS – age-specific number of examinations/appliances/treatments and examinations/appliances /treatments per 1,000 population, 2018



**Notes:** \* Includes, but is not limited to, domiciliary visits, contact lenses, replacement lenses, replacement frames, plastic lenses for children, lenticular lenses, tinted lenses and prisms. COSS, Community Ophthalmic Services Scheme.

\*\* This is the only category in which there are activities/treatments for patients aged ≤15 years – 40 examinations

~ Includes chronic inflammatory conditions.

^ Includes, but is not limited to, vitreo/retinal conditions, ocular naevi/tumours and neuroophthalmological conditions.

**Source:** HSE PCRS.

### 5.2.3 Optical Treatment Benefit Scheme

#### Utilisation

In 2018, 357,456 unique individuals claimed optical benefit provided by the OTBS. Eye examinations and the supply of distance and reading spectacles were the most frequently claimed-for activities/treatments. Figure 13 shows how the number and rate per 1,000 population of OTBS activities and treatments vary by age and sex. With regard to eye examinations, higher utilisation by female claimants is observable in younger age categories up to approximately 65–70 years of age, with male utilisation generally higher thereafter. Utilisation by both sexes peaks between the ages of 40 and 50. A similar age- and sex-specific utilisation profile is evident in relation to distance spectacle provision. Consistent with the later onset of presbyopia, provision of reading spectacles remains low until the age of 40, when claims increase rapidly, peaking between the ages of 45 and 55.

**FIGURE 13** OTBS – age- and sex-specific number of activities/treatments and activities/treatments per 1,000 population, 2018

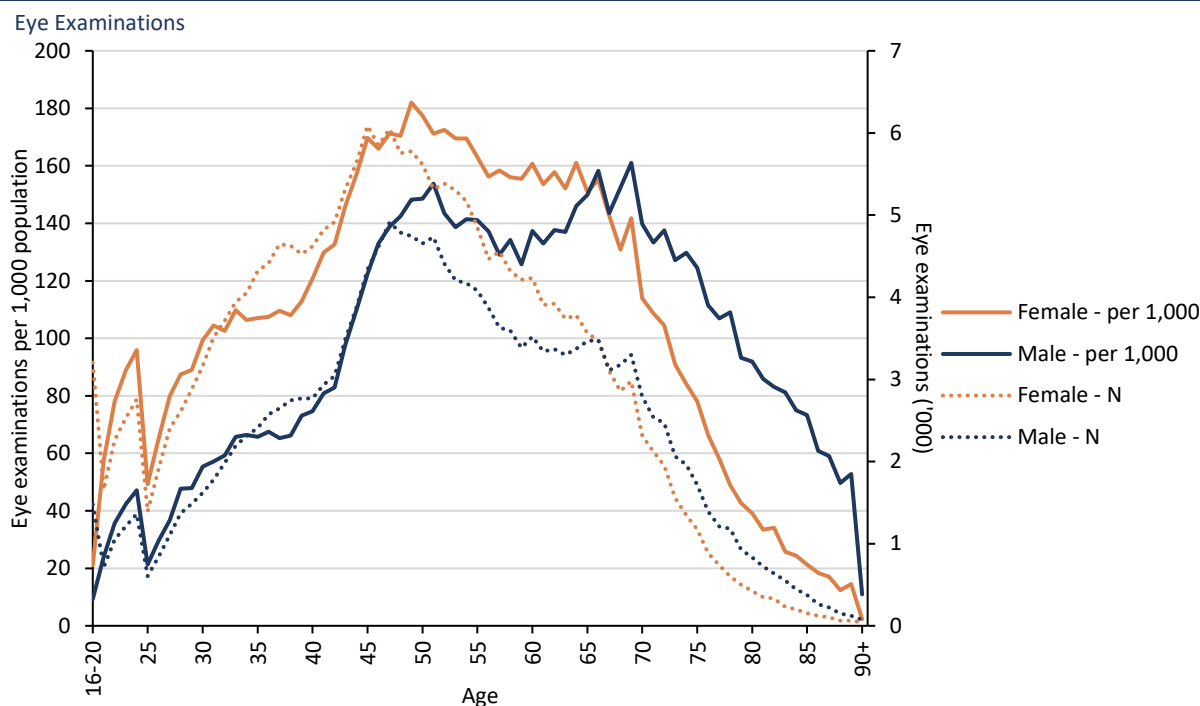
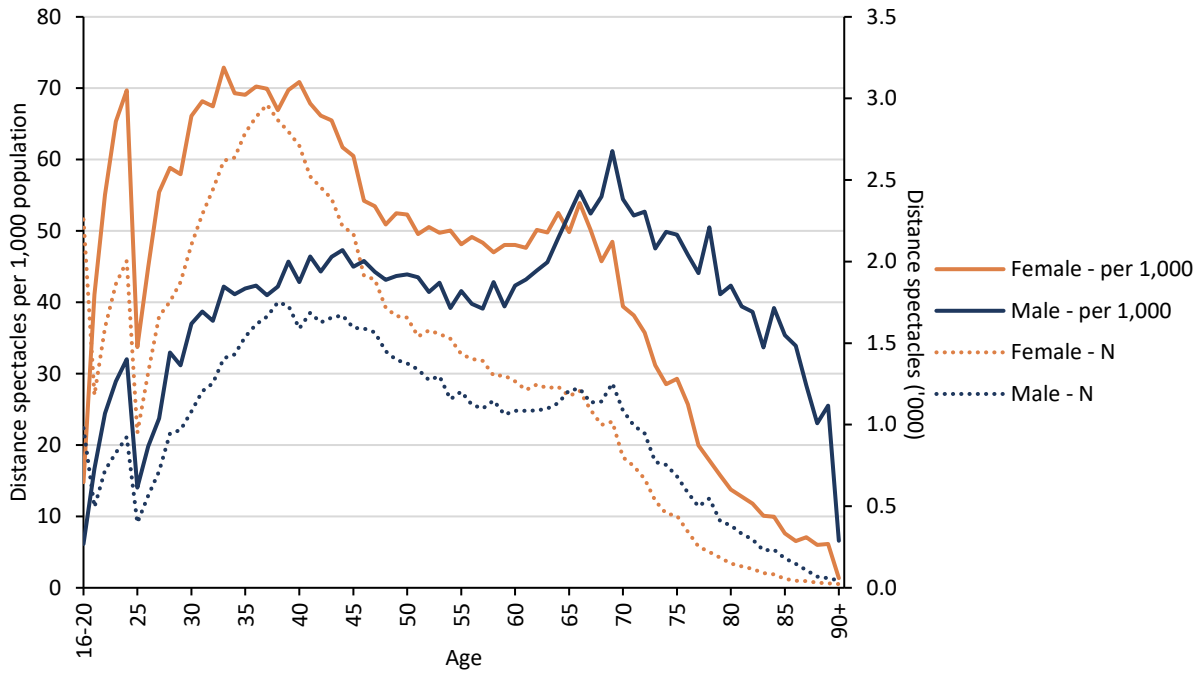


FIGURE 13 Continued

Distance Spectacles - Single Vision



Reading Spectacles - Single Vision

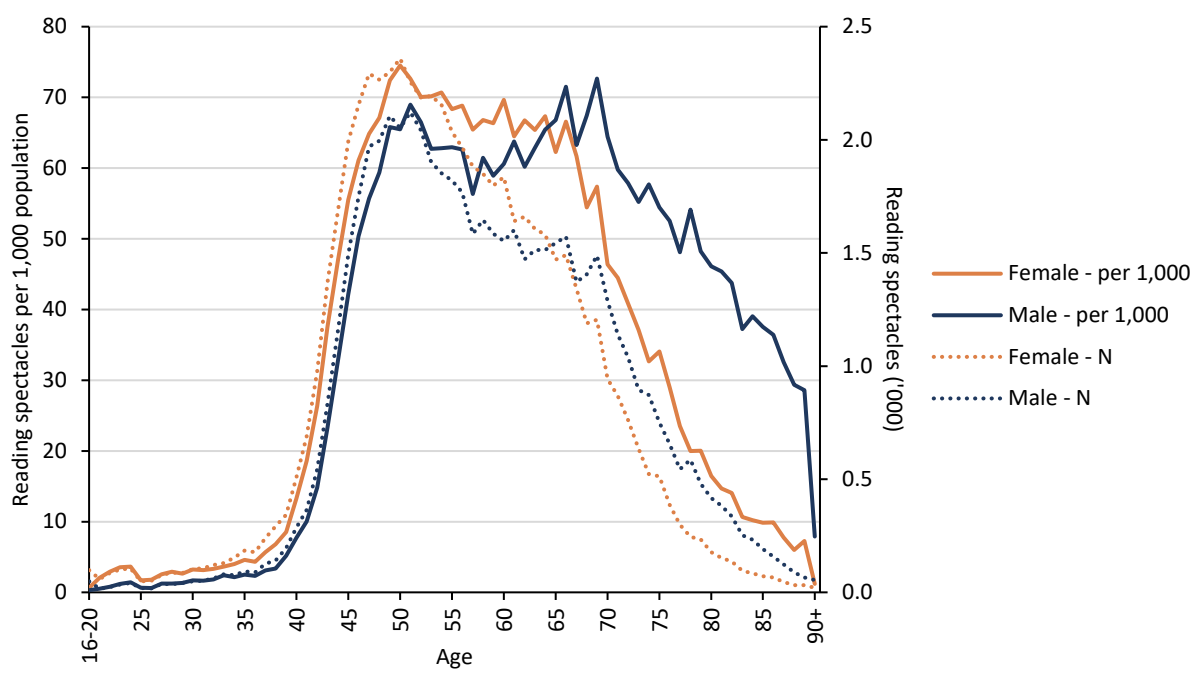
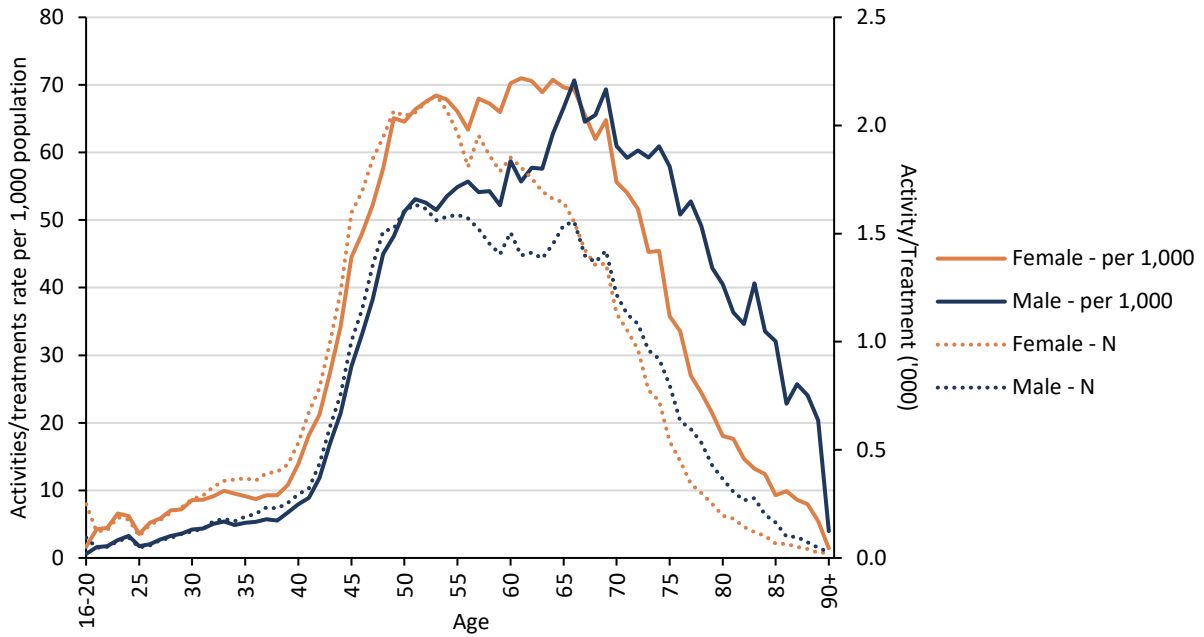


FIGURE 13 Continued

Other OTBS Activities/Treatments

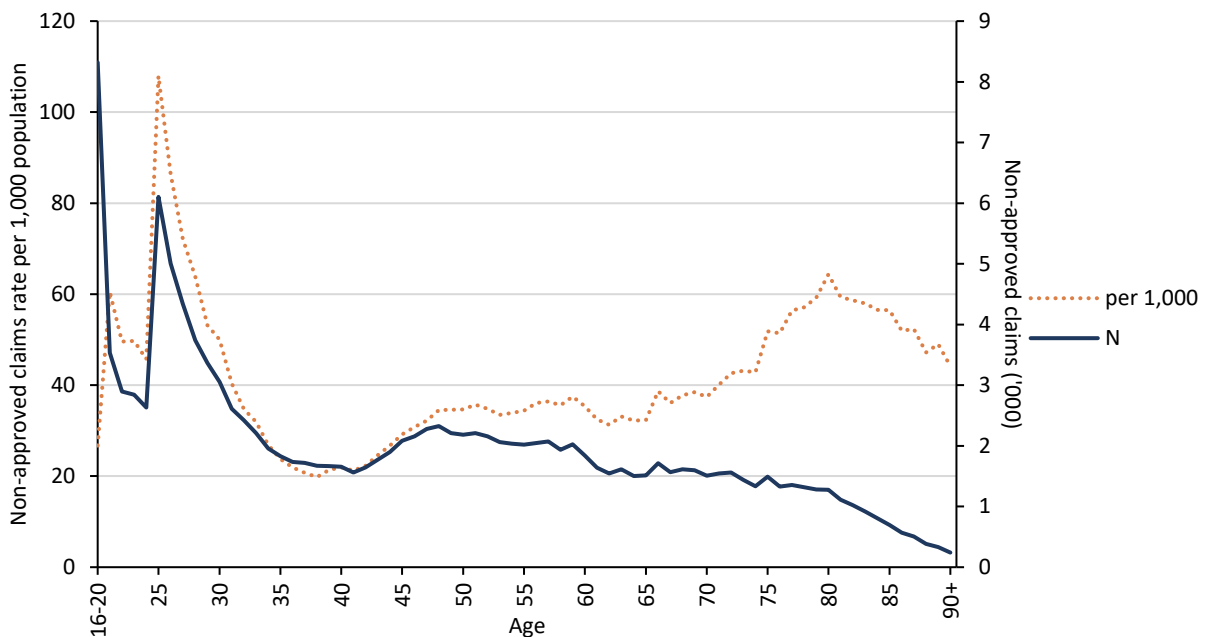


Source: HSE PCRS.

Unmet demand

As shown in Figure 14, the variation in the number and rate (per 1,000 population) of non-approved claims by age is similar to that observed in relation to the dental aspect of the scheme. The highest number of non-approved claims relates to individuals aged 25, with numbers declining in older age groups. These data are to be excluded from the Hippocrates Model due to the potential for duplication of eligibility checks for individual claimants.

FIGURE 14 OTBS – age-specific number of non-approved claims and non-approved claims per 1,000 population, 2018



Source: DEASP.

## 6 CONCLUSIONS

In this report we have outlined the methods used to generate baseline estimates of public dental and optical service utilisation. The analysis makes use of the best available data to inform projections of service utilisation by the Hippocrates Model.

Given the improving data environment, future iterations will likely be subject to considerable revision. For example, the conversion of orthodontic records to an integrated, digitised format should allow for applicable data to be incorporated. Moreover, the commencement of the collection of national-school vision screening metrics by public-health nurses should permit the inclusion of this activity in the future. In the medium to long term, implementation of a national oral health evaluation programme, as envisioned by the National Oral Health Policy (Department of Health, 2019b), may lead to improvements in the collection of information pertaining to unmet demand for public dental services. Deficits in data collection on primary eye-care services have been acknowledged by the report of the PCESRG, and a national Primary Care Eye Services Clinical Patient Management System has been included in the Blueprint for the Future Provision of Primary Care Eye Services. By providing a means of collation of patient metrics and feedback, this system could also facilitate more accurate quantification of unmet demand for optical services (Primary Care Eye Services Review Group, 2017).

We estimate that almost two thirds of dental expenditure is privately financed (section 2.2.5). A considerable share of total utilisation therefore occurs within the private sector and is not quantifiable on the basis of the currently available data. That said, data on utilisation of privately financed dental services are to be collated as part of the national oral health evaluation programme<sup>41</sup> and, when available, it may be possible to incorporate these data into the model in the future. There is a similar paucity of data pertaining to the utilisation of privately financed optical services. It is clear that material improvements in the information on private optical service utilisation are also necessary to provide a more comprehensive profile of service utilisation as a whole.

Through collation of the available data, this report has generated estimates of baseline utilisation profiles, by age and sex, for an extensive range of publicly financed dental and optical services. These findings will inform the development of projections of demand and expenditure, using the Hippocrates Model.

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<sup>41</sup> Department of Health personal communication, 22 July 2020.

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Whitaker Square,  
Sir John Rogerson's Quay,  
Dublin 2  
Telephone **+353 1 863 2000**  
Email **admin@esri.ie**  
Web **www.esri.ie**  
Twitter **@ESRIDublin**