

Health Systems in Transition

Vol. 24 No. 2 2022

Oral health care in Europe

Financing, access and provision

Juliane Winkelmann
Jesús Gómez Rossi
Ewout van Ginneken

Juliane Winkelmann (Editor) and Ewout van Ginneken (Series Coordinator) were responsible for this HiT

Editorial Board

Series editors

Reinhard Busse, Berlin University of Technology, Germany
Josep Figueras, European Observatory on Health Systems and Policies
Martin McKee, London School of Hygiene & Tropical Medicine, United Kingdom
Elias Mossialos, London School of Economics and Political Science, United Kingdom
Ewout van Ginneken, European Observatory on Health Systems and Policies

Series coordinator

Anna Maresso, European Observatory on Health Systems and Policies

Editorial team

Jonathan Cylus, European Observatory on Health Systems and Policies
Cristina Hernández-Quevedo, European Observatory on Health Systems and Policies
Marina Karanikolos, European Observatory on Health Systems and Policies
Sherry Merkur, European Observatory on Health Systems and Policies
Dimitra Panteli, Berlin University of Technology, Germany
Wilm Quentin, Berlin University of Technology, Germany
Bernd Rechel, European Observatory on Health Systems and Policies
Erica Richardson, European Observatory on Health Systems and Policies
Anna Sagan, European Observatory on Health Systems and Policies
Anne Spranger, Berlin University of Technology, Germany
Juliane Winkelmann, Berlin University of Technology, Germany

International advisory board

Tit Albreht, Institute of Public Health, Slovenia
Carlos Alvarez-Dardet Díaz, University of Alicante, Spain
Rifat Atun, Harvard University, United States
Armin Fidler, Management Center Innsbruck
Colleen Flood, University of Toronto, Canada
Péter Gaál, Semmelweis University, Hungary
Unto Häkkinen, National Institute for Health and Welfare, Finland
William Hsiao, Harvard University, United States
Allan Krasnik, University of Copenhagen, Denmark
Joseph Kutzin, World Health Organization
Soonman Kwon, Seoul National University, Republic of Korea
John Lavis, McMaster University, Canada
Vivien Lin, La Trobe University, Australia
Greg Marchildon, University of Regina, Canada
Nata Menabde, World Health Organization
Charles Normand, University of Dublin, Ireland
Robin Osborn, The Commonwealth Fund, United States
Dominique Polton, National Health Insurance Fund for Salaried Staff (CNAMTS), France
Sophia Schlette, Federal Statutory Health Insurance Physicians Association, Germany
Igor Sheiman, Higher School of Economics, Russian Federation
Peter C. Smith, Imperial College, United Kingdom
Wynand P.M.M. van de Ven, Erasmus University, The Netherlands
Witold Zatonski, Marie Skłodowska-Curie Memorial Cancer Centre, Poland

Health Systems in Transition

Oral health care in Europe: Financing, access and provision

Juliane Winkelmann

European Observatory on Health Systems and Policies and
Department of Health Care Management, Berlin University of Technology

Jesús Gómez Rossi

Department of Oral Diagnostics, Digital Health and Health Services Research,
Charité Universitätsmedizin

Ewout van Ginneken

European Observatory on Health Systems and Policies



The European Observatory on Health Systems and Policies supports and promotes evidence-based health policy-making through comprehensive and rigorous analysis of health systems in Europe. It brings together a wide range of policy-makers, academics and practitioners to analyse trends in health reform, drawing on experience from across Europe to illuminate policy issues.

The Observatory is a partnership, hosted by WHO/Europe, which includes other international organizations (the European Commission); national and regional governments (Austria, Belgium, Finland, Ireland, Norway, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and the Veneto Region of Italy (with Agenas)); other health system organizations (the French National Union of Health Insurance Funds (UNCAM), the Health Foundation); and academia (the London School of Economics and Political Science (LSE) and the London School of Hygiene & Tropical Medicine (LSHTM)). The Observatory has a secretariat in Brussels and it has hubs in London (at LSE and LSHTM) and at the Berlin University of Technology.

KEYWORDS:

DELIVERY OF HEALTH CARE

FINANCING HEALTH

HEALTH CARE REFORM

DENTAL CARE

© **World Health Organization 2022 (acting as the host organization for, and secretariat of, the European Observatory on Health Systems and Policies).**

All rights reserved. The European Observatory on Health Systems and Policies welcomes requests for permission to reproduce or translate its publications, in part or in full.

Please address requests about the publication to:

**Publications,
WHO Regional Office for Europe,
UN City,
Marmorvej 51,
DK-2100 Copenhagen Ø, Denmark**

Alternatively, complete an online request form for documentation, health information, or for permission to quote or translate, on the Regional Office website (<http://www.euro.who.int/pubrequest>).

The views expressed by authors or editors do not necessarily represent the decisions or the stated policies of the European Observatory on Health Systems and Policies or any of its partners.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the European Observatory on Health Systems and Policies or any of its partners concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Where the designation “country or area” appears in the headings of tables, it covers countries, territories, cities, or areas. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers’ products does not imply that they are endorsed or recommended by the European Observatory on Health Systems and Policies in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The European Observatory on Health Systems and Policies does not warrant that the information contained in this publication is complete and correct and shall not be liable for any damages incurred as a result of its use.

Suggested citation:

Winkelmann J, Gómez Rossi J, van Ginneken E. Oral health care in Europe: Financing, access and provision. *Health Systems in Transition*, 2022; 24(2): pp. 1–169.

CONTENTS

Preface	5
Acknowledgements	7
List of abbreviations	9
List of tables, figures and boxes	11
Abstract	15
Executive summary	17
1 Introduction	21
2 Oral health status in Europe: a brief overview	27
2.1 <i>Oral health diseases in Europe</i>	28
2.2 <i>Risk factors of oral diseases and inequalities</i>	31
2.3 <i>Oral health and oral health care data availability</i>	33
3 Financing oral health	39
3.1 <i>Dental care expenditure</i>	40
3.2 <i>Sources of dental care funding</i>	44
4 Dental care coverage in Europe	55
4.1 <i>A framework to compare coverage of dental care across Europe</i>	56
4.2 <i>Dental care coverage by country</i>	59
4.3 <i>Patterns of dental care coverage across European countries</i>	83
4.4 <i>Dental care coverage reforms in Europe</i>	91
5 Access to dental care and unmet needs	97
5.1 <i>Unmet dental care needs due to financial reasons</i>	98
5.2 <i>Unmet dental care needs due to other reasons</i>	104
5.3 <i>Inequality in access to dental care</i>	107

6	Oral health workforce	115
	6.1 <i>Dentist densities and trends</i>	116
	6.2 <i>Geographical distribution and ageing of dentists within countries and implications for access to dental care</i>	122
	6.3 <i>Other oral health professionals</i>	125
7	Provision of dental care	131
	7.1 <i>Dental public health</i>	132
	7.2 <i>Utilization of oral health services</i>	140
	7.3 <i>Public and private provision</i>	142
	7.4 <i>Corporate dentistry</i>	144
	7.5 <i>Cross-border dental care</i>	146
	7.6 <i>Trends in dental care provision</i>	147
8	Conclusions	151
9	Appendices	153
	9.1 <i>References</i>	153
	9.2 <i>HiT methodology and production process</i>	166
	9.3 <i>The review process</i>	169
	9.4 <i>About the authors</i>	169

PREFACE

The Health Systems in Transition (HiT) series consists of country-based reviews that provide a detailed description of a health system and of reform and policy initiatives in progress or under development in a specific country. Each review is produced by country experts in collaboration with the Observatory's staff. In order to facilitate comparisons between countries, reviews are based on a template prepared by the European Observatory, which is revised periodically. The template provides detailed guidelines and specific questions, definitions and examples needed to compile a report.

HiTs seek to provide relevant information to support policy-makers and analysts in the development of health systems in Europe and other countries. They are building blocks that can be used to:

- learn in detail about different approaches to the organization, financing and delivery of health services, and the role of the main actors in health systems;
- describe the institutional framework, process, content and implementation of health care reform programmes;
- highlight challenges and areas that require more in-depth analysis;
- provide a tool for the dissemination of information on health systems and the exchange of experiences of reform strategies between policy-makers and analysts in different countries; and
- assist other researchers in more in-depth comparative health policy analysis

Compiling the reviews poses a number of methodological problems. In many countries there is relatively little information available on the health system and the impact of reforms. Due to the lack of a uniform data source, quantitative data on health services are based on a number of different sources, including data from national statistical offices, the Organisation for Economic Co-operation and Development (OECD), the International

Monetary Fund (IMF), the World Bank's World Development Indicators and any other relevant sources considered useful by the authors. Data collection methods and definitions sometimes vary, but typically are consistent within each separate review.

A standardized review has certain disadvantages because the financing and delivery of health care differ across countries. However, it also offers advantages because it raises similar issues and questions. HiTs can be used to inform policy-makers about experiences in other countries that may be relevant to their own national situations. They can also be used to inform comparative analysis of health systems. This series is an ongoing initiative and material is updated at regular intervals.

Comments and suggestions for the further development and improvement of the HiT series are most welcome and can be sent to contact@obs.who.int.

HiTs and HiT summaries are available on the Observatory's website (<https://eurohealthobservatory.who.int>).

ACKNOWLEDGEMENTS

The Health Systems in Transition (HiT) profile on oral health care was produced by the European Observatory on Health Systems and Policies (Observatory) with support from the Charité- University Medicine Berlin and the Health Systems and Policy Monitor (HSPM) network.

The HSPM is an international network that works with the Observatory on Country Monitoring. It is made up of national counterparts that are highly regarded at national and international level and have particular strengths in the areas of health systems, health services, public health and health management research. They draw on their own extensive networks in the health field and their track record of successful collaboration with the Observatory to develop and update the HiT.

This edition was written by Juliane Winkelmann (Berlin University of Technology/European Observatory), Jesús Gómez Rossi (Charité Berlin/GKV Spitzenverband) and Ewout van Ginneken (European Observatory).

This edition was edited by Juliane Winkelmann, working with the support of Ewout van Ginneken, HiT Co-ordinator and Head of the Observatory's Berlin Hub. Final responsibility for creating this document based on authors' contributions rests with the editor.

The Observatory and the authors are extremely grateful to Sara Allin, Sara Burke, Chrystala Charalambous, Antonia Dimova, Astrid Eriksen, Giovanni Fattore, Cornelia Henschke, Maximilien Hjortland, Seyed Saeed Hosseinioun, Dominika Iždinská, Nils Janlöv, Marina Karanikolos, Kaija Kasekamp, Marie-Camille Lenormand, Úna McAuliffe, Liubove Murauskiene, Orsolya Németh, Jorge Espinosa Ossorio, Giada Scarpetti, Silvia Gabriela Scintee, Nathan Shuftan, Anne Spranger, Mamas Theodorou, Henrieta Tulejová, Sara Ulla and Jana Votápková for their inputs. Thanks are also extended to the Organisation for Economic Co-operation and Development (OECD) for the data on health expenditure, as well as demographic and macroeconomic indicators. The HiT reflects OECD data and national measures and policies available in October 2021 unless otherwise indicated.

The Observatory is grateful to Kenneth Eaton, Úna McAuliffe, Anna Maresso, Dimitra Panteli, Falk Schwendicke and Richard Watt for reviewing the report.

The Observatory is a partnership, hosted by the WHO Regional Office for Europe, that includes the Governments of Austria, Belgium, Finland, Ireland, Norway, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and the Veneto Region of Italy; the French National Union of Health Insurance Funds (UNCAM); the Health Foundation; the European Commission; the World Bank; the London School of Economics and Political Science (LSE); and the London School of Hygiene & Tropical Medicine (LSHTM). The Observatory is composed of a Steering Committee, core management team, research policy group and staff. Its Secretariat is based in Brussels, and it has offices in London at LSE and LSHTM and in Germany at the Berlin University of Technology. The Observatory team working on HiTs is led by Josep Figueras, Director; Elias Mossialos, Martin McKee, Reinhard Busse (Co-directors); Ewout van Ginneken and Suszy Lessof. The Country Monitoring Programme of the Observatory and the HiT series are coordinated by Anna Maresso. The production and copyediting process was coordinated by Jonathan North, with the support of Lucie Jackson, Sarah Cook (copy-editing) and Steve Still (typesetting).

LIST OF ABBREVIATIONS

AC	Autonomous Community (Spain)
AI	Artificial Intelligence
ASVG	Austrian General Social Security Act (Austria)
CAD	Computer-aided Design
CAM	Computer-aided Manufacturing
CDO	Chief Dental Officer
CED	Council of European Dentists
CECDO	Council of European Chief Dental Officers
CHIF	Croatian Health Insurance Fund (Croatia, Lithuania)
CMUc	Complementary universal health coverage (Couverture maladie universelle complémentaire, France)
CPITN	Community Periodontal Index of Treatment Needs
CWF	Community water fluoridation
DMFT	Decayed, Missing and Filled Teeth
dmf-t	Decayed missing filled teeth (primary dentition)
DPB	Dental Practice Board (the UK)
DTBS	Dental Treatment Benefit Scheme
DTSS	Dental Treatment Services Scheme (Ireland)
ECHI	European Core Health Indicators
EEA	European Economic Area
EHIF	Estonian Health Insurance Fund (Estonia)
EHIS	European Health Interview Survey
EOPYY	National Organization for the Provision of Health Services (Greece)
ESY	Hellenic National Health System (Greece)
EU	European Union
EU-SILC	EU Statistics on Income and Living Conditions (survey)
FDI	World Dental Federation
GBD	Global Burden of Disease

GDP	Gross Domestic Product
GDC	General Dental Council (UK)
GHS	General Health System (Cyprus)
GP	General Practitioner
HIIS	Health Insurance Institute of Slovenia
HIO	Health Insurance Organization (Cyprus)
HiT	Health Systems in Transition
HIV	Human immunodeficiency virus
HSE	Health Service Executive (Ireland)
HSPM	Health System Policy Monitor
ICDAS	International Caries Detection and Assessment System
LTC	Long-term care
MHI	Mandatory Health Insurance
MHI	Mutual Health Insurance (Switzerland)
NCD	Noncommunicable disease
NGO	Non-governmental organization
NHI	National Health Insurance (Finland)
NHIF	National Health Insurance Fund (Bulgaria)
NHS	National Health System
NUTS	Nomenclature of Territorial Units for Statistics
NZA	National Health Authority (Netherlands)
OECD	Organisation for Economic Co-operation and Development
OOP	Out-of-pocket
PDS	Public Dental Services (Cyprus, Finland, Ireland)
PPP	Purchaser Power Parity
PPS	Purchasing Power Standard
PSI	Periodontal Screening Index
PRSI	Pay-Related Social Insurance (Ireland)
SCHER	Scientific Committee on Health and Environmental Risks
SEK	Swedish krona
SHA	System of Health Accounts
SHI	Social Health Insurance
SSN	National Health Service (Italy)
UHC	Universal health coverage
VHI	Voluntary Health insurance
WHO	World Health Organization

LIST OF TABLES, FIGURES AND BOXES

Tables

TABLE 2.1	Oral health and oral health care indicators	37
TABLE 4.1	Description of statutory coverage for dental care in 31 countries	59
TABLE 4.2	List of common dental procedures in preventive and curative dental care	85
TABLE 4.3	Categories of statutory dental care coverage	86

Figures

FIGURE 2.1	Most prevalent conditions in the EU, 2019	29
FIGURE 2.2	Age-standardized prevalence of oral diseases in Europe in %, 2019	30
FIGURE 3.1	Per capita expenditure on outpatient dental care in European countries (in US\$ PPP), 2008–2019	42
FIGURE 3.2	Expenditure on dental outpatient care, as % of total health expenditure, 2008–2019	43
FIGURE 3.3	Out-of-pocket, voluntary health insurance and public spending for dental care as % of total dental expenditure, 2019	45
FIGURE 3.4	Public spending on dental care as a % of total dental expenditure, 2008 and 2019	46
FIGURE 3.5	Public per capita expenditure on dental outpatient care (in US\$ PPP), 2008–2019	47
FIGURE 3.6	Private per capita expenditure on dental outpatient care (in US\$ PPP), 2008–2019	49
FIGURE 3.7	Shares of out-of-pocket medical spending by services and goods, 2019	50
FIGURE 3.8	Total OOP spending on dental care per capita (in US\$ PPP), by type of out-of-pocket spending, 2019	52

FIGURE 4.1	The three dimensions of universal health coverage	58
FIGURE 4.2	Coverage of dental care by category for statutory dental care coverage in Europe	89
FIGURE 4.3	Share of public spending on dental care by categories of statutory dental care coverage, 2019	90
FIGURE 5.1	Share of adults reporting unmet needs for dental examination for financial reasons, 2008 and 2019 (EU-SILC)	101
FIGURE 5.2	Share of adults reporting unmet needs for dental care, medical care and prescription drugs due to financial reasons (EHIS 2014)	102
FIGURE 5.3	Share of adults who did not seek dental care because of cost in the past year, 2016	103
FIGURE 5.4	Unmet needs reported (EU-SILC) vs OOP dental expenditures as % of total health expenditure, 2019	104
FIGURE 5.5	Main reasons for unmet needs for dental care other than financial reasons, 2019	106
FIGURE 5.6	Share of adults reporting unmet needs for dental examination due to financial reasons, by income level, 2019	108
FIGURE 5.7	Share of out-of-pocket payments spent on dental care among households with catastrophic health spending and unmet needs for dental care in Lithuania and Germany	111
FIGURE 5.8	Probability of a dental visit in the past 12 month by income quintile	112
FIGURE 6.1	Number of practising dentists (per 100 000 population) and dental visits per person per year, 2019 (or latest year)	118
FIGURE 6.2	Practising dentists per 100 000 inhabitants, 2008 and 2019 (or latest available year)	120
FIGURE 6.3	Number of active dentists per 100 000 population, 2008 and 2019, using CECDO data	122
FIGURE 6.4	Dentist distribution at national level and by region (NUTS2) with lowest and highest density per 100 000 population in 10 European countries in 2015	123
FIGURE 6.5	Dental hygienists, dental nurses and dental technicians per 100 000 population in European countries, 2019	127

FIGURE 7.1	Dentist consultations per person per year (in all settings), 2008 and 2019	141
FIGURE 7.2	Share of dentists working in private practice, 2004 and 2013 (or nearest available)	144

Boxes

BOX 2.1	Definitions of the most important oral diseases	28
BOX 2.2	The DMFT index	35
BOX 3.1	VHI in France and the Netherlands	54
BOX 5.1	Different reporting on unmet needs in EU-SILC and the European Health Interview Survey (EHIS)	99
BOX 5.2	Dental prices in the Netherlands: a failed experiment with free pricing	100
BOX 5.3	Inequalities in access to oral health care in France	109
BOX 5.4	Drivers of oral health inequalities: the example of Germany and Lithuania	110
BOX 6.1	Scope of practice of registered dental therapists in the UK	128
BOX 6.2	The variety of oral health professionals: the example of Ireland	130
BOX 7.1	The PADI programme reduced the burden of dental diseases in childhood in the Basque Country and Navarre	137
BOX 7.2	The Childsmile programme in Scotland	138

Oral health care in Europe

With growing awareness of the large burden of oral diseases and how limited coverage affects both access and affordability, oral health policy has been receiving increased attention in recent years. This culminated in the adoption of the WHO resolution on Oral Health in 2021, which urges Member States to better integrate oral health into their universal health coverage and noncommunicable disease agendas.

This study investigates major patterns and developments in oral health status, financing, coverage, access, and service provision of oral health care in 31 European countries. While most countries cover oral health care for vulnerable population groups, the level of statutory coverage varies widely across Europe resulting in different coverage and financing schemes for the adult population. On average, one third of dental care spending is borne by public sources and the remaining part is paid out-of-pocket or by voluntary health insurance. This has important ramifications for financial protection and access to care, leaving many dental problems untreated. Overall, unmet needs for dental care are higher than for other types of care and particularly affect low-income groups.

Dental care is undergoing various structural changes. The number of dentists is increasing, and the composition of the health workforce is starting to change in many countries. Dental care is increasingly provided in group practices and by practices that are part of private equity firms. Although there are (early) signs of a shift towards more preventive therapies and policies of oral diseases, dental care overall remains focused on treatment.

A lack of data affects all areas of oral health care. Current health information systems only collect very few indicators on oral health and

oral health care. An improved evidence base would allow more meaningful assessments and comparisons of oral health systems performance. This in turn would allow better informed policy decisions and enable better targeted and more effective oral health interventions.

EXECUTIVE SUMMARY

Oral diseases remain an important burden of disease despite decreasing prevalence in all age groups and stronger focus on preventive care

Oral health has largely improved over the last decades among all age groups due to improved living conditions, changed dietary patterns and the use of fluoride as well as improved oral hygiene. Yet the prevalence of poor oral health is still high. Although many oral diseases are largely preventable at an early stage, nearly half of the adult population in the EU suffers from oral diseases, mainly untreated dental caries and periodontal diseases with large variation across European countries. Oral diseases share many common risk factors with noncommunicable diseases (diet, smoking, etc.) and hence a significant part of the disease burden is associated with socioeconomic status, age and lifestyle behaviour, as is the case for many chronic conditions (diabetes, obesity, heart disease, etc.).

Lack of harmonized data reporting on oral health system indicators impedes evidence-informed policy-making

There is currently no systematic data collection system on oral health status and dental care. However, these data are needed to assess the burden of oral diseases and oral risk factors and to evaluate and further develop (community-based) oral health interventions. An improved evidence base on oral health care would ultimately allow the performance and quality of oral health care to be measured and thus inform oral health policies.

Although oral diseases represent a huge financial burden, on average only a third of spending is paid by public schemes in the EU

Oral diseases ranked third behind diabetes and cardiovascular diseases in terms of expenditures per disease in the European Union. In most European countries surveyed, spending on dental care increased both in absolute terms and as a share of GDP. The share of public funding in dental care is relatively low compared to most other health services due to restricted service packages. On average, only one third of dental care is borne by government schemes or compulsory insurance while more than two thirds of dental care spending is paid out-of-pocket or by voluntary health insurance. The latter plays an important role in many countries, covering dental care services that are either completely or partially excluded from the publicly financed benefit packages.

Statutory coverage of dental care for adults is limited in many countries while children and other vulnerable groups often enjoy broader coverage

Statutory coverage of dental care varies a great deal across Europe. While most countries provide extended coverage for vulnerable population groups such as children and older people, coverage of dental care for the adult population is generally less comprehensive. Three categories of countries can be distinguished in regard to statutory dental coverage: (1) countries with comprehensive coverage that include dental care within their broader health system, (2) countries with partial coverage that have dental care partially privately covered and (3) countries with limited coverage where the majority of dental care services are only available through private sources. Coverage of dental care became a policy concern for many countries after the financial crisis when budget pressures let the dental benefit package erode further. More positively, a number of countries have extended their dental benefit package (e.g. Estonia, France, Ireland), or are envisaging ways to improve access to dental care by introducing public dental care coverage (e.g. Portugal, Spain).

Unmet needs for dental care are higher than for other types of care and mainly reported by low-income people

With public coverage of dental care being limited, about 3% of the European population tends to forgo dental care for financial reasons, leaving many dental problems untreated. Dental care is the most frequent type of care for which people report unmet needs. There are large variations in unmet need for dental care across countries and socioeconomic groups: in particular, 6.1% of low-income people across the EU seeking dental care reported having some unmet needs for dental care, compared with 0.7% for high-income people. However, overall the share of people reporting unmet need for dental care due to financial reasons has decreased since 2008 in most European countries.

The oral health workforce has increased but is often unequally distributed

Many countries have seen a substantial increase in the number of dentists which is mainly driven by privatization of dental care and cross-border dental care. Countries have different dental training systems producing varying number of graduates which also impacts migration of dentists. While there is a three-fold variation in dentists per population across European countries, geographical imbalances within countries are often more pronounced, with many dentists being located in urban areas. This affects access to care in rural areas where patients face longer travel times and waiting times.

Dental care continues to be treatment-dominated by solo practices but there is a shift towards more prevention and provision in group practices with new dental professional roles

Dental care is largely dominated by a treatment and technology-based approach. However, dental public health and preventive care have started to gain importance, and many countries have oral health promotion programmes for different population groups and fluoridation strategies

in place to prevent cavity and other oral diseases. A “common risk factor approach” has regained attention in the 2021 WHO resolution on dental care which urges countries to address the risk factors of oral diseases in a more holistic way and to better integrate dental care in other care areas. In most European countries dental care is provided privately in solo practices. However, there is an increasing number of dentists working in group practices which allows sharing of equipment, responsibilities and tasks and specializing within dental disciplines. There is also a change in the composition of the dental workforce with dental hygienists and assistants increasingly providing preventative services.

The dental care sector is marked by two developments: an increasing number of private equity firms are investing in the dental care market and acquiring individual practices and smaller group practices. These dental chains dominate the market in many European countries and create an even more competitive environment market with often detrimental consequences for small practices. Finally, cross-border care remains an important aspect in the provision of dental care. Many European citizens use opportunities provided by the European framework on cross-border care for dental services in countries with lower prices for services that are only partly covered in their country.

Introduction

Oral health is a central component of general health. Although most oral diseases can be prevented by health promotion strategies and routine access to primary oral health care, about half of the European population suffers from some form of caries (tooth decay) or periodontitis (gum diseases) (Patel, 2012). Oral diseases, most of which are chronic and progressive in nature, cause pain, infection and low quality of life, and have a negative impact on individuals, communities and the wider society (Peres et al., 2019). The causes of oral diseases, particularly dental caries, are often complex and multifactorial, influenced by biological factors and the social determinants of health. Oral health shares common risk factors with other noncommunicable diseases, including high intake of free sugars, smoking and harmful alcohol (Peres et al., 2019; Sheiham & James, 2013; Sheiham & Watt, 2000; Watt et al., 2019). Furthermore, poor oral health is also associated with chronic conditions such as diabetes, cardiovascular diseases, aspiration pneumonia and premature birth (D’Aiuto et al., 2017; Patel, 2012; Terpenning, 2005). This makes oral health central to disease prevention and people’s overall health status and quality of life (Kossioni et al., 2018; Patel, 2012). As populations age and people are retaining most of their own teeth, older adults are experiencing particularly high levels of oral diseases. Evidence has illustrated that this may be complicated by barriers to accessing care, including the availability and supply of oral health professionals (Allin et al., 2020; Bellander et al., 2021; Kossioni et al., 2018; Listl, Moeller & Manski, 2014; Manski & Moeller, 2017; Watt & Serban, 2020).

A most important feature of oral health is that oral diseases are largely preventable (Benzian et al., 2021; Watt et al., 2019; WHO, 2021a). Individual oral health promotion strategies (such as oral hygiene practices) and population prevention strategies (e.g. community water fluoridation) are safe, clinically effective and cost-effective (Cronin et al., 2021). Another key

feature is that oral health care (for the most part) does not require emergency attention, as oral diseases, if identified early, can be managed in primary care and rarely have life-threatening or catastrophic impacts on individuals' health. However, due to poor coverage and high out-of-pocket payments, oral health problems often require emergency treatment (non-life-threatening) and may be the main reason for hospital admissions in particular among children, as is the case, for example, in England (Levine, 2021).

Given the importance of oral health as a component of overall health, it has received increased attention in public health debates in recent years (see, for example, the two-part series of the *Lancet* on oral health, 2019). In May 2021 the World Health Assembly approved an historic WHO resolution on oral health which urges Member States to address key risk factors of oral diseases and enhance the professional capacity of oral health professionals to deliver consistent and quality care. The resolution calls on Member States to enhance a shift from the traditional curative approach towards a preventive approach and to better integrate strategies on oral health promotion, prevention and treatment into overall noncommunicable disease policies (see Section 7.1). In the resolution Member States committed themselves to include oral health in universal health coverage (UHC) benefit packages (WHO, 2021b). To help shape these commitments, a new WHO Draft Global Strategy on Oral Health was published in 2021, which is waiting for finalization in 2022.

While there are calls for stronger political commitment to improve oral health systems, publicly funded oral health coverage remains limited in many countries in Europe and access to essential oral health services remains unaffordable. Little is known about the large variations between countries in terms of financing, access, coverage and service delivery of oral health. There is a lack of international comparisons and understanding of who delivers oral health services (privately or publicly), how much funding is devoted to oral health care and who funds the costs for which type of treatment (Eaton et al., 2019). Yet these are critical considerations for understanding the scope for improvement regarding financial protection against costs of dental care and equal access to services in each country.

This cross-country HiT aims to compare oral health systems across Europe regarding financing, access and provision of oral health care systems, which are key features distinguishing each system. The study aims to describe oral health care systems in key areas, identify common trends and patterns as well as differences across the EU and EEA countries, and analyse

policy implications, challenges and current trends. The study therefore is envisaged to fill a clear gap in the field of oral health systems comparisons and focuses on i) detailed country by country descriptions and analysis; ii) cross-country (mostly) quantitative comparisons with limited analysis; and iii) a range of detailed comparative analytical studies on different functions and areas of oral health systems.

The COVID-19 pandemic had a significant impact on the provision of dental care with routine care being restricted or paused and people forgoing dental examination and check-ups due to fear of infection. The World Dental Federation (FDI) reports higher incidence of tooth decay and oral diseases due to disrupted routines but also deteriorating eating habits related to repeated lockdowns, restrictions on people's movements and work-at-home edicts (FDI World Dental Federation, 2021). It must be noted that these effects will not be reflected in this cross-country HiT due to lack of data that capture these developments. However, it can be assumed that unmet needs for dental care have increased during the pandemic and also that providers may have experienced financial losses during extended lockdowns. Consequently, the pandemic has contributed an additional component of uncertainty around current overall trends.

Methodology

This study reviews various sources to provide timely and complete information to compare oral health care across 31 European countries (EU member countries, European Economic Area (EEA) countries, Iceland and Norway as well as the UK and Switzerland (EU27+4)). Information from the European Observatory on Health Systems and Policies' Health Systems in Transition reviews (both recently completed and under way) were complemented with information from the MISSOC database, EU Country Profiles 2019/2021 and Commonwealth International Health Care System Profiles in order to draft country specific descriptions of oral health systems. National regulatory documents as well as peer-reviewed and grey literature were used to identify and explore relevant policies and strategies at national and international level. If information was outdated, country-specific information was sent to appropriate country experts from the HSPM and authors' networks for review. Data on the indicators (expenditure, oral health care resources, oral health care utilization, etc.) come from the

Organisation for Economic Co-operation and Development (OECD Health Statistics). Data on financial protection were drawn from surveys such as the Commonwealth Survey, EU-SILC and EHIS. The country-specific descriptions of oral health systems are centrally placed in Section 4.2 of the HiT (Table 4.1, page 61), which allows readers to refer to and look up country-specific information on oral health systems whenever necessary.

Results are presented thematically in chapters. Each chapter begins with a brief summary of the main findings. Interesting examples from specific countries or on particular topics are highlighted in boxes for further illustration where appropriate.

Structure

The HiT presents results in thematic chapters which are aligned to the structure of the Observatory's health system reviews. The most relevant topics identified for oral health care mainly determine the structure of the review, i.e. oral health status, financing, coverage systems, unmet needs, oral health workforce and oral health service provision.

After this introductory chapter, Chapter 2 provides an overview of the current status of oral health in Europe, by first exploring oral diseases, and then briefly describing the determinants and main risk factors for oral disorders and inequalities within and across countries. Lastly, this chapter looks at the limitations in the availability of outcome data for oral health.

Chapter 3 describes the expenditure on outpatient dental care (total spending, public expenditure, patient cost-sharing) and analyses trends in the distribution of dental spending and sources of funding. It explores the shares of out-of-pocket payments and voluntary health insurance spending on dental care across countries, and related patterns.

Chapter 4 describes statutory coverage of oral health services and assesses the comprehensiveness of dental care coverage in terms of who is covered, what is covered and how much of benefit cost is covered. It analyses trends in dental care coverage across Europe and proposes a typology to classify countries by dental care coverage. The chapter ends with a description of current trends towards the extension of coverage of dental care in some European countries.

Chapter 5 analyses financial protection and unmet needs for dental care. It starts to outline implications for unmet needs for dental care and income-related inequalities in access to dental care. The chapter ends with an analysis of non-financial barriers for access to dental care.

Chapter 6 describes the main providers of oral health care across Europe and the current trends. This includes an analysis of the distribution of dentists across and within countries and the related challenges for access to oral health care. The chapter ends with an overview on other oral health professionals, namely dental nurses, dental therapists, dental hygienists and technicians.

Chapter 7 gives an overview of public dental health developments regarding population-based programmes and prevention strategies. It then reviews the trends and patterns in the utilization and delivery of dental care including the role of corporate dentistry and cross-border dental care. The chapter concludes with a short overview of the major trends in the provision of dental care.

Chapter 8 concludes with some overall lessons from the study and a call for improved data reporting systems on oral health outcomes and oral health care.

Oral health status in Europe: a brief overview

Summary

- Oral health is a central component of overall health and psychosocial well-being, yet preventable oral disorders are among the most prevalent health conditions in Europe.
- The major oral diseases are untreated dental caries, periodontal diseases, tooth loss and oral cancer. With people living longer and retaining more natural teeth into older life, oral health has become increasingly important for overall quality of life.
- The main risk factors for oral health are high sugar dietary intake, smoking, alcohol use and poor oral hygiene, which are largely determined by socioeconomic status, lifestyle, and environmental risk factors.
- Cross-country comparison of oral health status is hampered by the absence of systematic, standardized collection of epidemiological oral health data.
- Considering the links between periodontitis and various noncommunicable diseases, a better information exchange between dental service utilization and medical health records would be fundamental to achieving better integration of specialties and improved multidisciplinary preventive strategies.

2.1 Oral health diseases in Europe

BOX 2.1 Definitions of the most important oral diseases

Dental caries (tooth decay): caries or tooth decay leads to cavities that are caused by a breakdown of the tooth enamel by acids produced by bacteria located in plaque that collects on teeth, especially along the gumline and in the crevices on the chewing surfaces of the teeth. Eating and drinking foods high in carbohydrates cause this bacteria to produce the acids that can cause the outer coating of the tooth (enamel) or root surface to break down (demineralize).

Periodontal (gum) diseases: periodontal diseases are mainly the result of infections and inflammation of the gums and bone that surround and support the teeth. In its early stage, called gingivitis, the gums can become swollen and red, and they may bleed. In its more serious form, called periodontitis, the gums can pull away from the tooth, bone can be lost, and the teeth may loosen or even fall out. Periodontal diseases are mostly seen in adults.

Oral cancers: oral cancers include cancers of the lip, other parts of the mouth and the oropharynx.

Edentulism: edentulism is the state of being edentulous, or having lost all natural teeth.

Source: CDC, 2020.

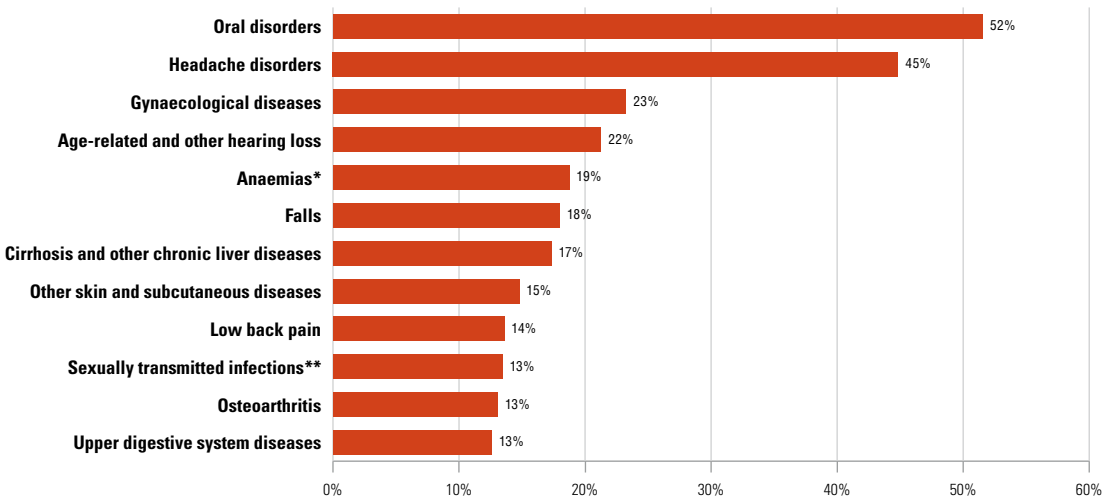
Oral health is a central component of overall health and psychosocial well-being (WHO Regional Office for Europe, 2018b). Oral health encompasses “*the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex*” (Glick et al., 2016). The most prevalent and consequential oral diseases are untreated caries, periodontal (gum) diseases, edentulism and oral cancer (lip and oral cavity cancers) (Peres et al., 2019) (Box 2.1).

Oral diseases are by and large preventable or can be treated at an early stage (e.g. dental caries, gum disease and oral cancer) (WHO, 2020a). Yet oral disorders, namely dental caries, periodontal diseases and edentulism, are the most prevalent group of conditions in the EU (Figure 2.1). About

half of the European population was estimated to suffer from oral diseases in 2019 according to data from the Institute for Health Metrics and Evaluation (IHME, 2022).

Since good national-level epidemiological survey data are lacking across Europe (also see Chapter 2.3), these IHME estimates, and thus the discussion below, need to be interpreted with caution.

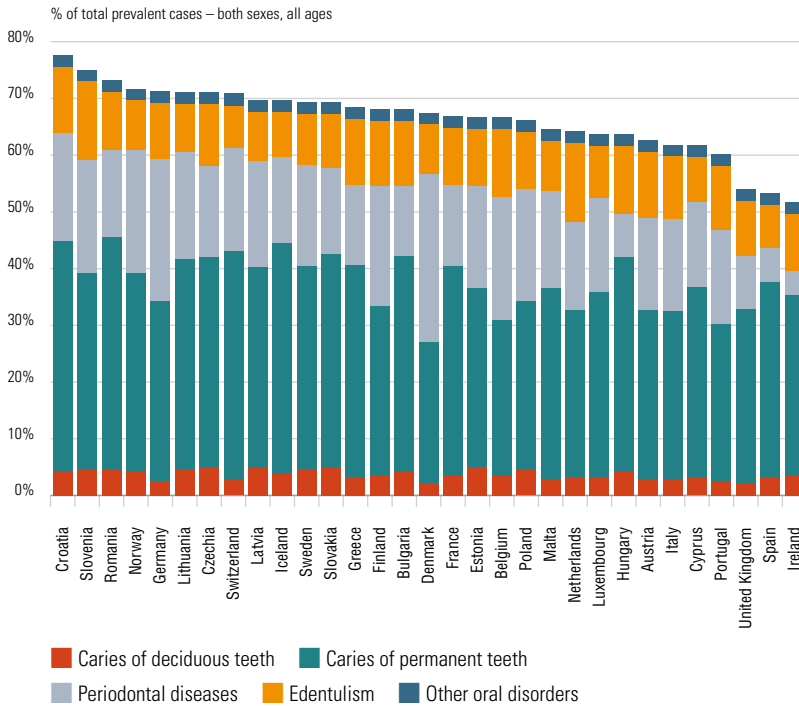
FIGURE 2.1 Most prevalent conditions in the EU, 2019



Source: IHME (2022), Global Burden of Disease, 2019.

Notes: *Haemoglobinopathies and haemolytic anaemias; ** without HIV.

Looking by cause of oral disease, untreated caries of permanent and deciduous teeth was the most prevalent oral disease in 2019, followed by periodontal diseases and tooth loss (edentulism). Data from the Institute for Health Metrics and Evaluation show that one in three people (33%) across the EU are estimated to suffer from caries of the permanent dentition (and 3% from untreated caries in deciduous teeth). One in six people were suffering from periodontal diseases (16%) and one in ten people had total tooth loss. The highest prevalence of oral diseases was reported in Eastern European countries with 60.6% cases in Croatia and 58.6% in Slovenia. At the other end of the spectrum are Ireland, Spain and the UK with relatively low prevalence of oral diseases (around 44%) (IHME, 2022) (Figure 2.2).

FIGURE 2.2 Age-standardized prevalence of oral diseases in Europe in %, 2019

Source: IHME (2022), Global Burden of Disease, 2019.

Note: The overall percentage of prevalence of oral diseases is lower than the sum of each one taken individually, because more than one oral disease can be prevalent in one person.

We now look in more detail at dental caries (tooth decay), periodontal (gum) diseases and oral cancers. As mentioned above, one of the most common chronic conditions is untreated dental caries, the severity and extent of which are measured by the D-component of the Decayed, Missing and Filled Teeth (DMFT) index. The GBD 2017 Oral Disorders Collaborators (2020) reported that lifetime prevalence of caries experience has decreased in many developed countries during the last four decades. Indeed, there has been a remarkable trend in improved oral health across OECD countries with a decline in DMFT and an increase in the caries-free population (OECD, 2009; Pipitone & Eaton, 2013). However, untreated caries remains a problem for socioeconomically deprived groups in all EU Member States and in particular in Eastern European countries (OECD, 2019a; Patel, 2012; Peres et al., 2019; Petersen, 2003; Pipitone & Eaton, 2013). Given the extent of these conditions, since people live longer and retain their teeth for longer, oral disorders have a considerable impact on well-being and quality of life.

Periodontal diseases is a main cause of tooth loss in adults globally (Bernabe et al., 2020). However, the limited availability of data on periodontal diseases for European countries does not enable an analysis of the disease burden of periodontal diseases or of the need for periodontal care within Europe (König, Holtfreter & Kocher, 2010). Periodontitis is an important risk factor for several systemic diseases and conditions, such as diabetes mellitus, cardiovascular disease, rheumatoid arthritis, adverse pregnancy outcomes and aspiration pneumonia. The relationship between diabetes and periodontitis, for example, is complex, with feedback loops contributing to worsen one another (Preshaw et al., 2012). A holistic approach focusing on shared risk factors and enhanced cooperation between general medical practitioners and oral health professionals is therefore critical for enhanced person-centred care. Better information exchange between dental service utilization and medical health records would be fundamental to achieving better integration of specialties and improved multidisciplinary preventive strategies. This is even more relevant given the links between periodontitis and various noncommunicable diseases (Dörfer et al., 2017).

Oral cancers, with tobacco use and alcohol consumption being among the main drivers, account for a substantial share of the burden of noncommunicable diseases in Europe (WHO Regional Office for Europe, 2018a). There are important geographical variations in incidence and mortality due to oral cancers, not only between Western and Eastern Europe but also across regions and socioeconomic groups and high-risk groups, with Hungary recording the highest incidence and mortality rates. Northern France records high incidence rates in men and Denmark high incidence rates among women. This variation reflects differences in lifestyle and in exposure to risk factors (Diz et al., 2017). Generally, the risk of oral cancer is significantly higher in low-income groups (Conway et al., 2009).

2.2 Risk factors of oral diseases and inequalities

The main risk factors for oral health are also shared with many other noncommunicable diseases (NCDs) such as diabetes and cardiovascular disease (WHO, 2020b). While some risk factors cannot be changed (such as congenital conditions), others are determined by socioeconomic status, lifestyle, and behavioural and environmental factors. These include an

unhealthy diet, especially with high consumption of sugar, tobacco, alcohol, and poor oral hygiene (FDI World Dental Federation, 2015). Intake of sugar has increased significantly worldwide in the last five decades, although there are differences among countries. According to WHO data, free sugar intake among adults in Europe ranges from about 7–8% of total energy intake¹ in countries like Hungary and Norway, to 16–17% in countries like Spain and the United Kingdom. For children the intake is higher, for example from around 12% in Denmark to nearly 25% in Portugal (WHO, 2015). The WHO strongly recommends reduction of the intake of free sugar to less than 10% of total energy intake (WHO, 2015). Tobacco is a primary risk factor for oral cancer and pre-cancer (WHO Regional Office for Europe, 2018c) as well as periodontitis (Schwendicke, Dörfer & Meier, 2018). Smoking rates in several countries are higher than the EU average, for example in Austria, Bulgaria, Croatia, Cyprus, France, Greece, Hungary, Latvia and Spain. Excessive alcohol consumption is also problematic because alcohol consumption increases the risk for developing gum disease, tooth loss/decay, oral cancer and accidents to the face/teeth. One third or more of all adults reported binge drinking² in several EU countries in 2019 (Denmark, Germany, Luxembourg and Romania) (European Commission, OECD, & European Observatory on Health Systems and Policies, 2021). With regards to oral hygiene, a 2014 survey showed that there are considerable differences in the percentage of 15-year-olds who brush their teeth more than once a day among countries in Europe. The gender gap is substantial, with fewer 15-year-old boys than girls reporting that they brush their teeth more than once a day (Inchley et al., 2016).

Generally, lower socioeconomic and vulnerable groups of the population are more susceptible to the risk factors mentioned above, resulting in socioeconomic inequality in oral health (Patel et al., 2016). In addition, the socioeconomic status is a risk in itself as social disadvantage causes health disadvantages. Socially and economically deprived people tend to visit the dentist less often (Palència et al., 2014; Reda et al., 2018) but when they attend they tend to seek care at emergency departments due to pain, rather than for preventive care (Platform for Better Oral Health in Europe, 2015).

¹ Total energy intake is the sum of all daily calories/kilojoules consumed from food and drink.

² Binge drinking is defined as consuming six or more alcoholic drinks on a single occasion for adults and five or more alcoholic drinks for teenagers.

In particular, in countries without publicly funded oral health services, fewer people seem to visit the dentist in general (Patel et al., 2016) (see also Section 5.3). Improving access to high quality and affordable dental care services, in particular access to preventive dental care (e.g. fluoride treatments) for vulnerable and low-income groups, as well as for the general population, is a major public health challenge (see Section 5.3).

2.3 Oral health and oral health care data availability

There is currently no systematic collection of oral health data in Europe and as a result no epidemiological data to create a valid “Oral Health Index”. A more systematic collection of oral health indicators (including periodontal diseases) and alignment of methodologies throughout Europe would make comparable analysis possible and meaningful. Recent initiatives, such as the Manifesto “Why Oral Health Matters”, launched by the Platform for Better Oral Health in Europe in December 2019, as well as the Lancet 2019 series on oral health, call for a systematic collection of relevant oral health data (Peres et al., 2020; Platform for Better Oral Health in Europe, 2019; Watt et al., 2019).

There is thus a lack of up-to-date data and information on the burden of oral diseases, but also on oral health risk factors. Furthermore, data collection systems rarely include outcome measures or oral health care utilization data. This poses a challenge in the continuous assessment of oral health and related health inequalities (Patel, 2012; WHO, 2020a). By integrating data on oral health status and oral health risk factors, the oral health effects of socio-behavioural factors could be estimated, which could then be used to draw up intervention strategies (Miyazaki, Jones & Beltrán-Aguilar, 2017). The lack of evidence on oral health status, risk factors and special needs for services of vulnerable population groups (e.g. elderly, disabled) is a problem for the development of community-based oral health interventions and health promotion programmes that aim to reduce inequalities in oral health.

Within the WHO surveillance tools there are oral modules available such as the WHO Oral Health Surveys Basic Methods and the Oral Health STEPwise approach. However, these tools are not systematically used and further efforts are needed to coordinate oral health surveillance and

monitoring systems (WHO Provisional agenda 148th session, Executive Board) (WHO, 2013, 2020a). One of the largest data collections on oral health worldwide is the Global Burden of Disease Study 2017 (GBD), which provides estimates on prevalence, incidence and years lived for untreated dental caries, severe periodontitis and total tooth loss in 1990 and 2017 (Bernabe et al., 2020).

Various well-developed approaches to monitor health status exist at the country level. The WHO has accumulated valuable country-level and international experiences for the collection of oral health data (Miyazaki, Jones & Beltrán-Aguilar, 2017). However, a comprehensive monitoring instrument that integrates the various experiences and that is systematically used across countries is still missing. The WHO has recognized this challenge and that lack of information on the burden of oral disease and the weak monitoring of existing oral health programmes inhibits the prioritization of oral public health in the World Health Assembly resolution on oral health in 2021 (WHO, 2021b).

There are a number of outcome measurements for oral diseases. One of the most important has been the Decayed, Missing and Filled Teeth (DMFT) index (see Box 2.2), which is part of a series of indicators that aim to measure dental caries experience. The DMFT has traditionally been used to describe and monitor the tooth decay of the population by age, socioeconomic status, etc. However, it has limitations, mainly that it does not necessarily reflect the complete caries experience (early lesions are usually missed), but also it does not distinguish tooth loss due to caries from loss due to other conditions (such as trauma, periodontitis). Furthermore, it does not provide any indication about the subjective impact of caries on individuals and populations. In addition, comparing the oral health status across countries using the DMFT index remains a challenge (Patel et al., 2016) because different national data collection methods are used, different practices exist regarding clinician calibration, and there are significant gaps between the years in which national oral health surveys were conducted. Other measures for oral diseases include those for periodontal diseases, like the Community Periodontal Index of Treatment Needs (CPITN) (Miller, Roland & Benhamgar, 1994) or the Periodontal Screening Index (PSI), a range of oral hygiene-related indices as well as an increasing body of instruments to assess subjective oral health-related quality of life. These are not used as widely across countries as the DMFT index, and like the DMFT index they suffer from methodological differences leading to difficulties in generating accurate data and cross-country comparisons.

In Europe there exist various information systems that monitor noncommunicable diseases, risk factors and health interventions at cross-country level that result from a long-term cooperation between the EU Member States and international organizations, e.g. the European Commission, OECD, Eurostat. The most comprehensive information projects are the European Core Health Indicators (ECHI), the EU Survey on Income and Living Conditions (EU-SILC), and the Joint Questionnaires of Eurostat/OECD/WHO. These capture a comprehensive set of indicators on general health status, unmet needs, health care resources, health expenditure and health care utilization.

BOX 2.2 The DMFT index

The Decayed, Missing, Filled teeth (DMFT) index is currently the only universal index to measure oral health (in particular, caries experience in dental epidemiology). It has been used for almost 80 years. The DMFT index allows to assess both the oral health of the population and the extent of dental services needed, as well as previous dental experience and preventive activities in oral health (e.g. fluoride programmes, etc.).

The DMFT index is applied to the permanent dentition and is expressed as the total number of teeth or surfaces that are decayed (D), missing (M), or filled (F) in an individual. When written in lowercase letters, the dmf index is a variation that is applied to the primary dentition. International organizations (i.e. WHO, OECD) most commonly use the indicator age groups of 12-year-olds. A DMFT index of less than 1.2 is judged to be very low, 1.2–2.6 is low, 2.7–4.4 is moderate, and 4.5 or more is high (OECD, 2009).

Although this indicator is a valid instrument in assessing oral health given its common definition and simple calculation, cross-country comparison is difficult as there is wide variation in the years when oral health surveys were performed. A recent study shows that most of the current national caries data for DMFT levels in 12-year-old children are not comparable across Europe (Klingenberg, Winkelmann & Henschke, 2021). In particular, European countries apply a range of different sampling techniques, criteria for the detection of caries and methods to train and calibrate examiners. A number of countries only assess oral health at regional level, such as Switzerland. In Croatia the national DMFT score was derived from a survey in two schools (OECD, 2009; Patel et al., 2016). These different techniques and outdated data limit the reliability and comparability of resulting DMFT scores and some surveys are now using the International Caries Detection and Assessment System (ICDAS).

With regard to oral health and oral health care, the main indicators measure expenditure on outpatient dental care (public, private), unmet needs, numbers of dentists and number of dental visits per year. The EU Survey on Income and Living Conditions, for example, maps people's unmet need for dental examination within the last 12 months and the reasons why they did not go to the dentist.

However, compared to general health care, considerably fewer indicators are collected at European level that measure performance and quality of oral health care. In addition, the existing data on oral health care is often incomplete. Several countries do not report dental expenditure data, in particular private spending such as France, Italy and Portugal. This makes comparison of countries for the existing indicators difficult. It calls for more systematic, harmonized data collection, and a broader integration of quality indicators for oral health care in existing European data projects or other international data collection initiatives, such as those of the WHO.

The data collection initiative of the Council of European Chief Dental Officers (CEDCO) was started to address the lack of comprehensive data on oral health care systems. Since 1993 the CEDCO has collected information from Chief Dental Officers relating to oral health workforce, dental education, costs and oral health indicators in EU Member States, plus Iceland, Liechtenstein, Norway and Switzerland. In addition, the CEDCO also collects examples of guidelines, oral health plans and/or strategies relevant to oral health in the European region. However, information is not updated regularly and systematically. The data collected are publicly available in an Excel spreadsheet: <https://cecdo.org/oral-healthcare/cecdo-database/>.

To improve the evidence base for oral health care systems, various projects and initiatives have identified indicators for oral health care quality and recommend development of measures for monitoring and describing oral health morbidity and different facets of oral health care systems. Table 2.1 presents a selection of these indicators and constitutes a preliminary (harmonized) list of oral health systems indicators.

TABLE 2.1 Oral health and oral health care indicators

(1) ORAL HEALTH STATUS
<ul style="list-style-type: none"> • DMF-T in children and adolescents • Caries-free children and adolescents • Significant Caries Index/Oral cavity (persons with untreated tooth decay) • Periodontitis prevalence • Perceived oral health status • Adults with no tooth extraction • Edentulous prevalence in adults aged 65–74 years • Functional occlusion prevalence in adults aged 65–74 years
(2) DETERMINANTS OF ORAL HEALTH
<ul style="list-style-type: none"> • Intake of sugar-sweetened beverages • Residents with fluoridated water • Daily brushing with fluoride toothpaste (more than once a day) • Some important determinants of oral health (tobacco, alcohol consumption, overweight, consumption of vegetables and fruits) are covered in existing information systems
(3) ORAL HEALTH CARE SPENDING
<ul style="list-style-type: none"> • Public spending on dental care (government schemes, compulsory social and private health insurance) • Private spending on dental care (out-of-pocket, private insurance, cost-sharing/direct payments) • Persons purchasing private health insurance (complementary and supplementary) for dental care
(4) ORAL HEALTH CARE RESOURCES
<ul style="list-style-type: none"> • Number and age of dentists (specialist dentists, orthodontists, oral surgeons) (active, licensed) • Number of dental care practices, dental clinics by ownership (private/public) • Number of employed dentists, and number of dentists per practice • Number of dental graduates • Number of dental hygienists, dental therapists, dental nurses • Number of dental laboratory technicians • Migration of dental workforce (stock and inflow of foreign-trained professionals) • Remuneration of oral health workforce • Medical technology (e.g. number of x-ray machines)
(5) ORAL HEALTH CARE UTILIZATION
<ul style="list-style-type: none"> • Waiting times for visits to dentists, dental hygienists • Fixed period dental recalls • Number of dental screenings in the last two years • Number of surgical procedures • Share of people receiving teeth cleaning • Age-adjusted ER rate due to dental problems
(6) ORAL HEALTH CARE QUALITY AND SAFETY
<ul style="list-style-type: none"> • Success rate of implants, dentures, apicectomy and endodontics procedures • Oral cancer survival rate • Preventable dental hospitalization • Patient satisfaction • Consumption of antibiotics (number of Defined Daily Dose (DDD) for systemic use) • Age-adjusted ER rate due to dental problems

**(7) INFORMATION ON PREVENTIVE ORAL HEALTH SERVICES AND SCREENINGS AVAILABLE
(POPULATION-BASED AND TARGETED PROGRAMMES)**

- Number of children in preventive oral health programmes in educational settings
- National Health Promotion Strategy in place
- Oral health promotion campaigns in place (national/local)

Sources: based on Gonzáles et al., 2006; Australian Institute of Health and Welfare, 2020; Helsedirektorat, 1999; Nihtilä, 2010.

Financing oral health

Summary

- Oral diseases rank among the most costly health domains in the EU, just behind diabetes and cardiovascular diseases.
- Expenditure on outpatient dental care has increased in nearly all European countries between 2008 and 2019, both in terms of per capita expenditure and as a share of GDP, with the largest increases seen in the Baltic countries.
- Spending on dental services represents on average about 5.1% of total health spending across the 23 countries compared; this is below average expenditure for pharmaceuticals and medical devices.
- Dental spending from public sources accounts for on average about 31% of total spending on dental care in the 22 countries with available data, and remained relatively stable for the majority of countries.
- Direct payments by patients for dental services represent the largest source of funding, on average more than half (59%) of total dental care spending in 22 countries comes from out-of-pocket payments.
- Differences in dental care expenditure per capita and as a share of GDP seem to be influenced by variations in the unit costs of labour

and overhead costs, dental technology, material and laboratory services. Countries' overall economic performance also determines these metrics.

- Dental care is funded to a greater extent by private (out-of-pocket) patient payments than other areas of health care due to restricted service packages for dental care, except for children in most countries.
- Complementary and supplementary VHI play an important role in several countries, covering dental care services that are either completely or partially excluded from the publicly financed benefit packages.

3.1 Dental care expenditure

Overall, the high prevalence of oral diseases described in Chapter 2 represents a substantial economic burden for societies. Peres et al. (2019) estimated that in 2018 oral diseases accounted for €90 billion in direct costs (treatment expenditure) in the (then) 28 EU member countries, thereby ranking third behind costs for diabetes (€119 billion) and heart diseases (€111 billion).

The following sections focus on expenditure for outpatient dental care as it is reported within the System of National Health Accounts. Dental outpatient care includes the whole range of services usually performed in an outpatient setting, such as restorative care, tooth extractions, the fitting of dental prostheses, and dental implants and orthodontics. Dental services provided in a hospital or through day-care usually do not represent a large component and are therefore included under specialized services in the System of Health Accounts (SHA) and not reported in this review (OECD/Eurostat/WHO, 2017).

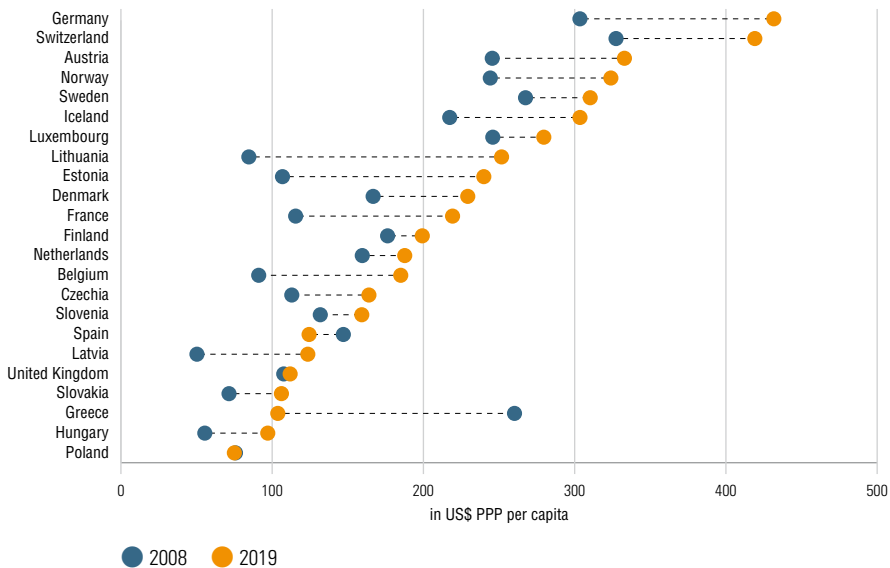
One approach towards assessing and contextualizing dental expenditure is looking at per capita spending which includes spending by government and compulsory health insurance (social health insurance schemes and compulsory private insurance schemes), voluntary health insurance and private spending such as households' out-of-pocket payments, NGOs and private corporations. Per capita expenditure, adjusted for purchasing power,

was available for 23 countries and ranged from US\$75 PPP (Poland) per capita to US\$431.7 PPP (Germany) per capita in 2019 (see Figure 3.1).

Figure 3.1 shows an upward trend of per capita dental expenditure across all countries, except for Greece, Poland and Spain. The largest increases of per capita expenditure between 2008 and 2019 can be observed in the three Baltic countries (Lithuania, Latvia, Estonia). In Estonia and Lithuania per capita expenditure rose from around US\$90 PPP in 2008 to about US\$240 PPP in 2019. Also, in Belgium and France per capita expenditure (nearly) doubled in this time period. No data are available on pre-economic crisis per capita expenditure levels for Greece. However, in 2008 per capita spending was close to the per capita spending of Luxembourg. Following a steep decrease in per capita expenditure until 2013, expenditure remained relatively stable, reaching similar spending levels to Hungary and Slovakia in 2019.

Varying per capita expenditures for dental care can be attributed to different factors, including the differences in unit costs of personnel, dental technology, material and laboratory services across countries. Secondly, the different unit costs of labour and overhead costs, as well as who provides dental care (dentists vs. other oral health professionals, e.g. dental technicians, dental hygienists and dental nurses), are the main reasons for varying per capita expenditure on dental care (Irish Dental Trade Association (IDTA), 2018; Tan, Redekop & Rutten, 2008). Lastly, the scope of dental care benefits covered by health insurance has an impact on total dental care expenditure per capita given that people are less likely to forgo dental treatment due to costs if coverage is broad (see also Section 5.1).

FIGURE 3.1 Per capita expenditure on outpatient dental care in European countries (in US\$ PPP), 2008–2019



Source: OECD Health Statistics, 2021.

Note: Data for Switzerland refer to 2010 and for the UK to 2013.

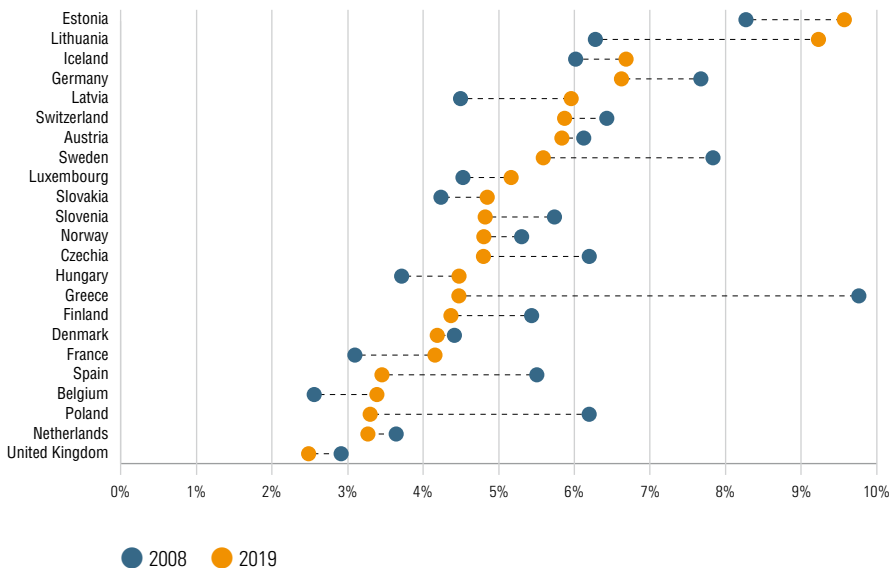
Dental expenditure can also be expressed in terms of spending as a share of GDP and total health expenditures. Total spending on dental care that includes spending by government and compulsory health insurance, voluntary health insurance and private spending ranged from 0.21% of GDP in Poland to 0.78% of GDP in Germany in 2019. Between 2008 and 2019 dental expenditure as a share of GDP had been increasing in many compared countries, and this growth was strongest in the three Baltic countries (Estonia, Latvia and Lithuania) as well as Belgium and France. These trends must be interpreted against the development of the national GDP within this period. In many countries the increase of dental expenditure as a share of GDP between 2008 and 2009 was due to a contraction in GDP following the global financial crisis.

As a share of total health expenditure, costs for dental treatment accounted for, on average, 5.1% of health spending across the 23 countries with available data in 2019. Compared to spending on other health services, dental care ranges below expenditure for inpatient care, long-term care and medical goods (EU27 averages of 29.1%, 16.3% and 18.4%, respectively) but

above the EU27 average health spending on prevention (2.9%) (European Commission, OECD & European Observatory on Health Systems and Policies, 2021).

Among compared countries, dental expenditure as a share of current expenditure on health in 2019 ranged from 2.5% in the UK to 9.6% in Estonia (Figure 3.2). From a longitudinal perspective, there is a fluctuation in both the trends and positioning among compared countries. Since 2008 dental expenditure as a share of current expenditure on health has declined in 14 out of 23 countries. This could mean that in these countries consumption levels and/or prices in other health sectors have increased much more strongly than in dental care. In those countries where dental expenditure increased the most, especially after 2010/2011 (Lithuania, Latvia and Estonia), this increase could be explained by a significant decline in the use of dental services during the financial crisis – in a context of low public coverage in these countries followed by an increase during the economic recovery that occurred afterwards (Leinsalu et al., 2018). On average, dental care spending as a share of total health spending decreased slightly from 5.5% in 2008 to 5.1% in 2019.

FIGURE 3.2 Expenditure on dental outpatient care, as % of total health expenditure, 2008–2019



Source: OECD Health Statistics, 2021.

Notes: data for Switzerland refer to 2010 and for the UK to 2013.

Summing this up, spending on dental care is increasing in absolute terms in nearly all countries, which mainly relates to rising unit costs. However, as a share of total health spending, a large number of the countries reviewed see a decline in spending which can be explained by a stronger increase (or prioritization) of health care expenditure in other health sectors such as long-term care or medical goods in these countries.

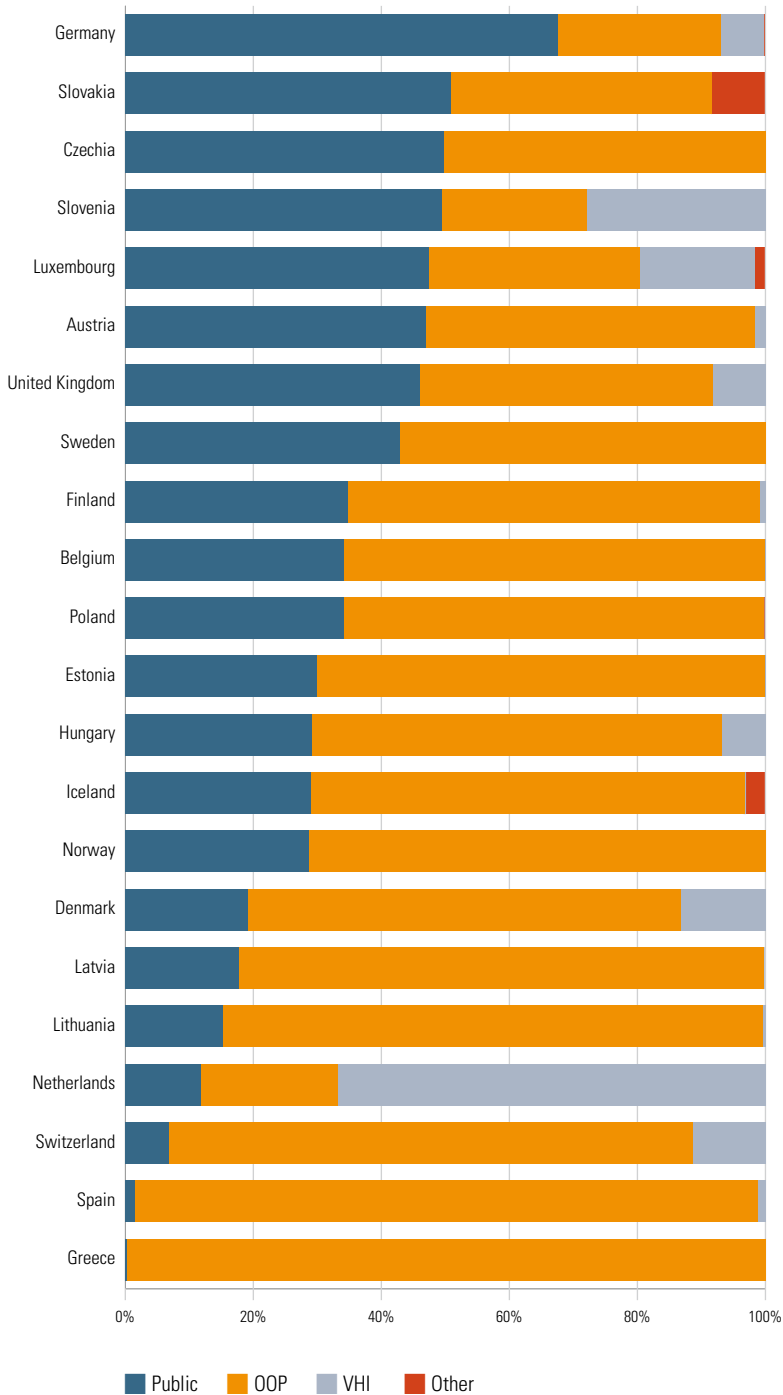
3.2 Sources of dental care funding

An important perspective for the analysis of dental care expenditure is the source of funding. In almost all countries, public coverage for dental care is more limited than other health care sectors, with restricted service packages (except for children in most countries) and higher levels of cost-sharing (OECD, 2018). Generally, dental care is funded to a greater extent by private patient payments than other areas of health care. In 2019 private spending accounted for more than half of total dental care expenditure in almost all countries. In Spain, Greece³, the Netherlands and Switzerland virtually all of dental care expenditure comes from private sources (Figure 3.3). In these countries adult dental care is generally not part of the basic package of public health insurance, although some care may be provided for certain population groups (see Section 4.2). Only in Germany and Slovakia do public sources fund more than half of dental care spending, with 68% and 51% respectively (Figure 3.3).

In this context, “private” denotes costs which are borne by patients themselves (out-of-pocket) and by voluntary/private health insurances. Out-of-pocket payments result from a combination of direct payments for uncovered services and cost-sharing payments for covered services. Out-of-pocket payments absorb the majority of private spending with about 86% of total private spending on dental care.

³ In Greece some dental services are covered by the statutory insurance fund but due to absence of functioning contracts between the insurance fund and private dentists and the lack of staff and capacity, health centres that provide dental services free of charge for children up to 18, in fact all payment for dental services are made privately by patients (see also Table 4.1 in Section 4.2) (European Commission, OECD & European Observatory on Health Systems and Policies, 2021).

FIGURE 3.3 Out-of-pocket, voluntary health insurance and public spending for dental care as % of total dental expenditure, 2019



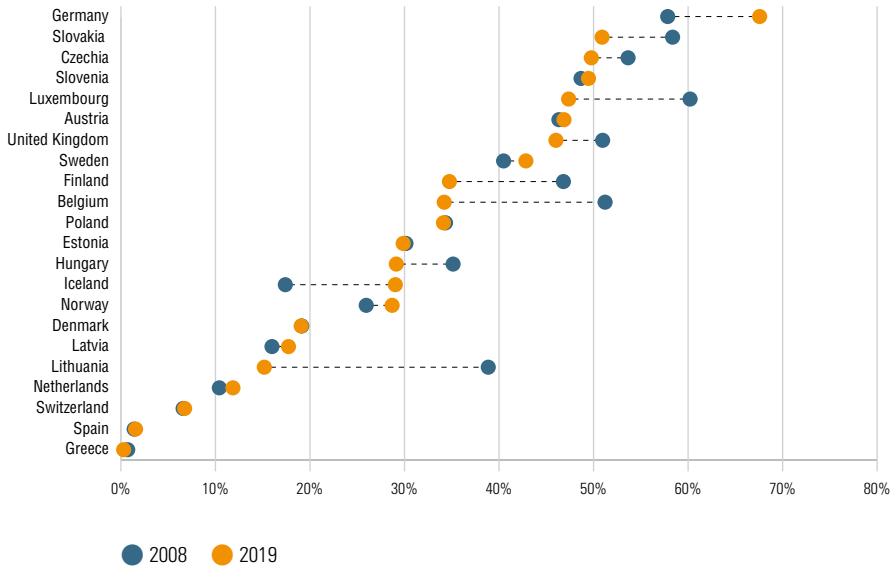
Source: OECD Health Statistics, 2021.

Notes: Other for Iceland and Slovakia refer to expenditures of non-profit institutions serving households (NPISH). Data for Switzerland refer to 2010 and for the UK to 2013.

3.2.1 Public sources

On average public spending accounted for 31% of total dental care spending in 2019 across 22 countries for which data were available. The share of public spending on dental care remained relatively stable; on average, there has only been a small decrease down from 34% in 2008. However, public dental care expenditure as a share of total dental spending fell significantly in a few countries such as Belgium, Finland, Lithuania and Luxembourg (Figure 3.4).

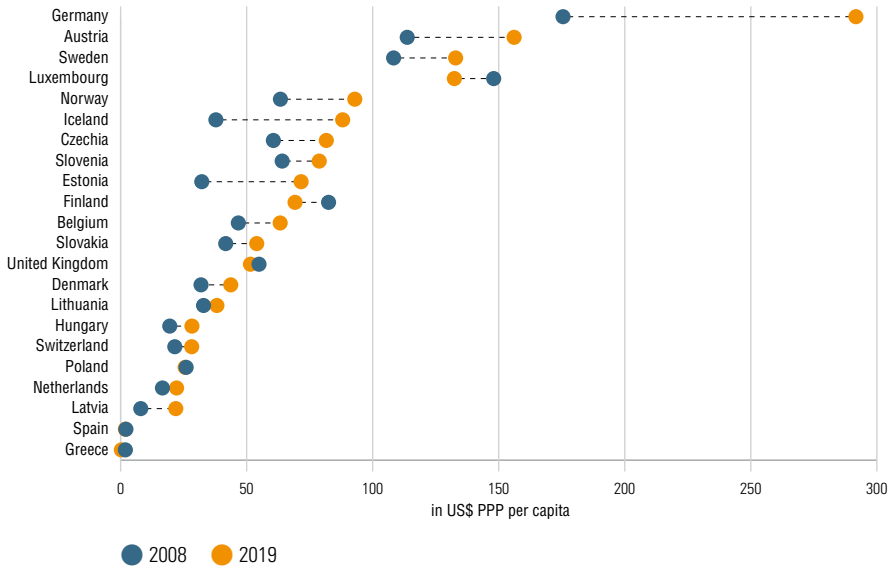
FIGURE 3.4 Public spending on dental care as a % of total dental expenditure, 2008 and 2019



Source: OECD Health Statistics, 2021.

Note: data for Switzerland refer to 2010 and for the UK to 2013.

FIGURE 3.5 Public per capita expenditure on dental outpatient care (in US\$ PPP), 2008–2019



Source: OECD Health Statistics, 2021.

Note: data for Switzerland refer to 2010 and for the UK to 2013.

In terms of spending per capita, among the studied countries public per capita expenditure on dental care in 2019 ranged between US\$291.70 PPP in Germany and US\$0.30 PPP in Greece (Figure 3.5). Austria’s public expenditure was second highest at US\$156.10 PPP, about half the amount of Germany’s public expenditure. The high spending level on dental care in Germany from public sources (almost 70% of dental expenditure) results from the comprehensive coverage of dental care, high utilization levels of dental services and increasing demand for dental services and dental care innovations (GFDI/VDDI, 2018). At the lower end of the spectrum are Greece, Spain and Latvia, which have limited public coverage of dental care (see Section 4.3). In the new EU member countries, providing oral care financed from public funds at an appropriate level constitutes a major challenge. For example, in Romania about 90% of the cost of dental treatments is paid privately (Oancea et al., 2016). In 2014 dental care accounted for only 0.2% of the total health services expenditure of the National Health Insurance Fund (Vladescu et al., 2016).

In contrast to private expenditure, public dental care expenditure per capita has increased at a much slower pace (Figure 3.5). Only in Germany has there been a large increase of public expenditure since 2009, which can be attributed to the fact that substitutive private health insurance became compulsory in 2009 and is therefore included in compulsory contributory health insurance schemes (subsumed as public financing) from this year onwards.

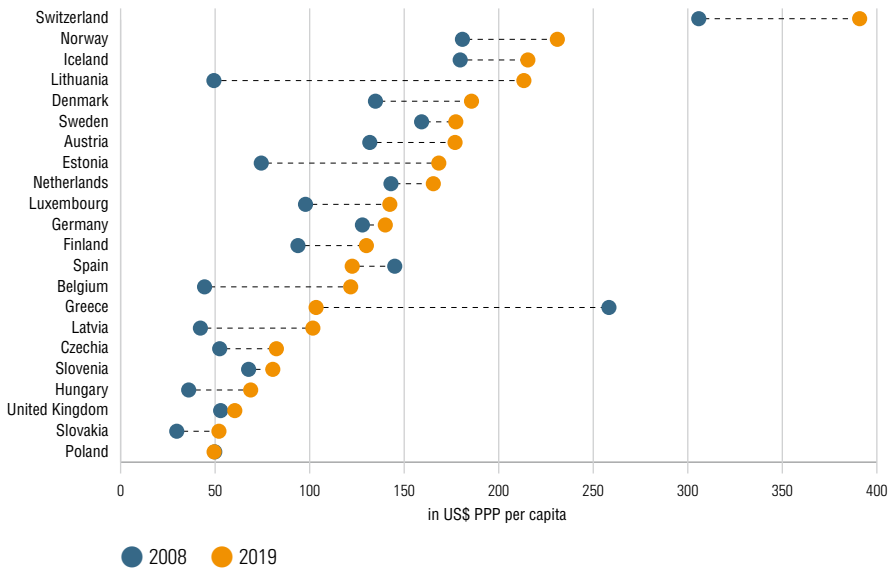
3.2.2 *Private sources*

Private spending is composed of voluntary health insurance premiums and out-of-pocket payments. On average, 68% of dental care expenditure is private across the 22 countries for which data were available.

Looking at private dental spending per capita, there is large variation across countries, ranging from US\$49.40 PPP in Poland to US\$390.90 PPP in Switzerland in 2019 (Figure 3.6). Following outlier Switzerland, Norway, Iceland, Lithuania and Denmark build the upper cluster in the sample while Hungary, Poland, Slovakia and the UK are at the lowest end of the spectrum.

From a longitudinal perspective, private expenditure on dental care has increased considerably in the last decade, both per capita and as a share of total health expenditure. Between 2008 and 2019 private dental spending per capita (current PPPs) on average increased by 55% across the 22 European countries for which data are available (Figure 3.6). Private dental care expenditure more than doubled in all Baltic countries as well as in Belgium. The largest increase was seen in Lithuania, where private dental expenditure grew from US\$51.70 PPP in 2008 to US\$213.50 PPP in 2019. This is partly a consequence of benefits reductions in the context of austerity measures during the financial crisis (Karanikolos et al., 2013; Thomson et al., 2013).

FIGURE 3.6 Private per capita expenditure on dental outpatient care (in US\$ PPP), 2008–2019

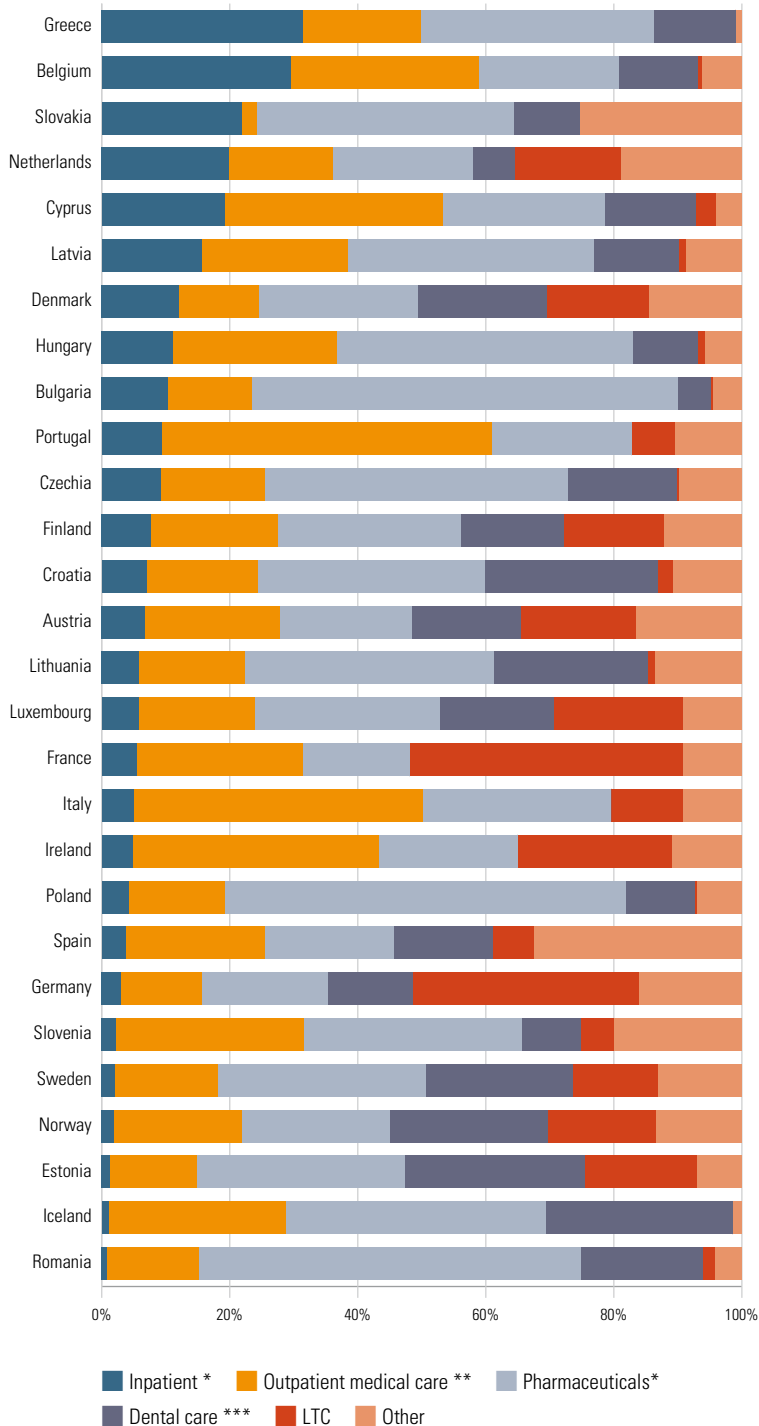


Source: OECD Health Statistics, 2021.

Note: data for Switzerland refer to 2010 and for the UK to 2013.

Out-of-pocket spending on dental care

Dental care is one of the main health services, besides medicines and therapeutic appliances, for which people are required to pay out-of-pocket (OECD, 2019b). As a share of total OOP expenditure on health, OOP dental spending represented on average 14.2% across 28 countries in 2019. This is below the average OOP spending on pharmaceuticals (33.4%) and outpatient medical care (22%), but above OOP spending on long-term care (9.9%) and inpatient care (9.2%). In Estonia and Iceland nearly one third of all out-of-pocket expenditure on health goes to dental care. At the other end of the spectrum are Bulgaria, the Netherlands and Slovenia, where out-of-pocket spending on dental care only ranges between 5% and 9% of total OOP spending on health (Figure 3.7). It must be noted that the average OOP spending on dental care might be underestimated due to missing data for France, Italy, Ireland and Portugal, and difficulties in confirming the true figure for direct patient to dentists payments in some countries. For Ireland Henry, Brick & Keegan (2021) approximated that almost two thirds of total dental expenditure was privately financed in 2018.

FIGURE 3.7 Shares of out-of-pocket medical spending by services and goods, 2019

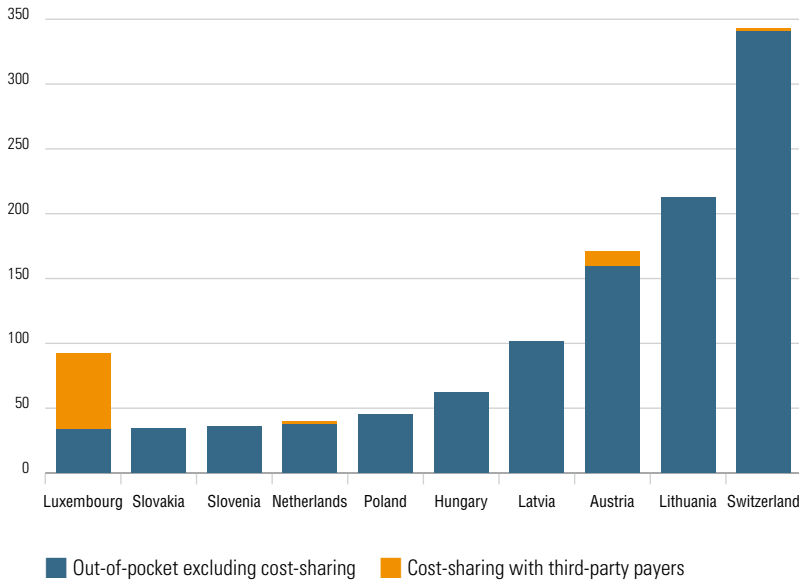
Source: OECD Health Statistics, 2021.

Notes: LTC = Long-term care; * Refers to curative-rehabilitative care in inpatient and day care settings; ** Includes home-care and ancillary services; *** Does not include therapeutic appliances and other medical durable goods.

Out-of-pocket spending represents the largest part (86%) of all private spending for dental care. On average, these direct payments for dental services make up 59% of total dental care expenditure, ranging from just above 20% in the Netherlands and Slovenia to about 100% in Greece and Spain (see Figure 3.3). Generally, most countries with low OOP spending on dental care have rather high public spending on dental care (see also Figure 3.4). Only the Netherlands is an outlier that compensates low public spending with high private spending on VHI.

The extent of OOP spending for dental care is determined by the services and costs that are covered as well as the degree of exemptions and the role and utilization of private insurance. OOP payments include direct payments for dental services that are not covered by any form of third-party payment. The most common services that are excluded from the benefit basket in many countries are dental prophylaxis and cosmetic treatments, as well as above standard material (such as ceramic crowns). OOP payments also include user charges for cost-sharing of services that are partially covered by health insurance or third-party payers. Partial coverage applies to many dental treatments with some user charges being required, for example, for removable and fixed dentures (see also Section 4.2). Figure 3.8 shows that for 10 countries with available data, the largest shares of OOP spending are borne by direct payments for services that are not in the publicly financed benefits packages. Only in Luxembourg is out-of-pocket spending borne by the cost-sharing rate of 88% for adult dental care.

FIGURE 3.8 Total OOP spending on dental care per capita (in US\$ PPP), by type of out-of-pocket spending, 2019



Source: OECD Health Statistics, 2021.

Note: data refer to 2017 for Slovakia and to 2018 for Poland.

Private VHI payment for dental care

The contribution of VHI to dental spending is relatively low compared to OOP spending. VHI spending accounts on average for 11.6% of total dental spending and 17% as a share of private dental expenditure across 13 countries for which data are available.

There are two main types of VHI. Complementary VHI covers cost-sharing applicable to public systems, whereas supplementary VHI covers top-up dental services that are not included in public systems or primary private health insurance (Rechel, Maresso & van Ginneken, 2019; Thomson, Cylus & Evetovits, 2019). Supplementary VHI schemes for dental care are often sold in combination with complementary VHI.

In countries with less comprehensive statutory dental coverage, VHI plays a very significant role in facilitating access to dentists and funding of dental care. In the Netherlands and Slovenia VHIs fund significant shares

of all dental care spending for adults (68% and 28%, respectively). In the Netherlands 83.7% of people had VHI in 2018 to cover dental services for adults which are not included in the basic benefit package of the statutory health insurance (“Basisverzekering”) (see Table 4.1 in Section 4.2). In Slovenia people have VHI to cover high co-payments for most dental services, apart from emergency services. In 2019, 95% of the population purchased voluntary health insurance in Slovenia. In Switzerland, Denmark and Luxembourg VHI’s contribution to dental spending was also above 11% in 2019 (Figure 3.3). France, which is not covered in Figure 3.3 due to lack of cross-country data on private expenditure, also has a sizeable VHI market for dental care (see Box 3.1) (Sagan & Thomson, 2016a).

Substitutive VHI, which usually covers population groups that are exempt from mandatory membership of the statutory scheme (due to level of earnings, age or type of occupation), plays a minor role for dental care and for medical care in general. Only in Germany is the market for substitutive private insurances important (Sagan & Thomson, 2016a). People with earnings over a certain threshold can opt out of the SHI insurance scheme and enrol in substitutive private health insurance. Substitutive private insurance usually offers a more comprehensive benefits basket of dental services.

In general, above standard treatments and more services such as dental prostheses, dental cleaning and orthodontics are usually covered. The share of the costs that private insurance companies reimburse is generally significantly higher than in the SHI insurance scheme.

BOX 3.1 VHI in France and the Netherlands

In **France** the mutual benefit associations (*mutuelles de santé*) existed since the 19th century, with the aim to cover patients' user charges (co-insurance amounts). In 1999 the government introduced a voluntary health insurance scheme (*CMUc: Couverture Maladie Universelle Complémentaire*) to improve access to care for more vulnerable persons. People not eligible for CMU coverage, but whose income is less than 35% above the CMU ceiling, can benefit from financial support for purchasing VHI. In 2018 about 95% of the French population had VHI contracts that cover user charges fully or in part for dental care (including prosthetic treatments), optical care, medicines and other ambulatory care services (DRESS, 2019). About half of individuals with VHI are covered by employer-provided group VHI contracts. Since 2016 all employers are required to offer group contracts for VHI to their employees that cover dental prosthetics up to 125% of the official tariffs. Usually, group contracts are mandatory for all employees and offer broader coverage than individual contracts (Chevreul et al., 2015; Sagan & Thomson, 2016b). In France VHI usually covers user charges, but in dental care VHI also offers enhanced coverage of items not well covered by the statutory scheme.

In the **Netherlands** VHI is increasingly purchased on a group basis and paid for by employers (Sagan & Thomson, 2016b). Usually, supplementary VHI for children is free and they are covered for the same VHI policies as the parents (Kroneman et al., 2016). With regard to dental care, only children are covered by the basic insurance package. Many adults (83.7% in 2018) therefore purchase VHI that covers fees for dental care up to a certain threshold (e.g. at least 75% of all dental care costs) with a maximum amount ranging usually between €200 and €1000 per year, depending on the type of insurance contract.

Dental care coverage in Europe

Summary

- Statutory coverage of dental care varies across European countries with regard to the population groups, the services and the costs they cover.
- In most countries vulnerable population groups such as children and older people enjoy broader coverage than the rest of the population; they are exempted from co-payments or are entitled to more dental care benefits. Coverage of dental care for the adult population is generally less comprehensive.
- In most countries there are specific regulations for the coverage of dental services for older people and/or other vulnerable population groups, including people with low income, homeless people, welfare recipients, pregnant women and persons with a greater need for dental treatment because of a particular condition.
- Countries with comprehensive coverage include dental care within their broader health system, while in countries with limited coverage dental care tends to sit outside the health system and the majority of dental care services are available through private sources.

- Various countries have recognized that limited coverage of dental care is a major barrier for equal and affordable access to oral health care services. They have introduced reforms to expand coverage of dental care for the entire population or vulnerable groups.

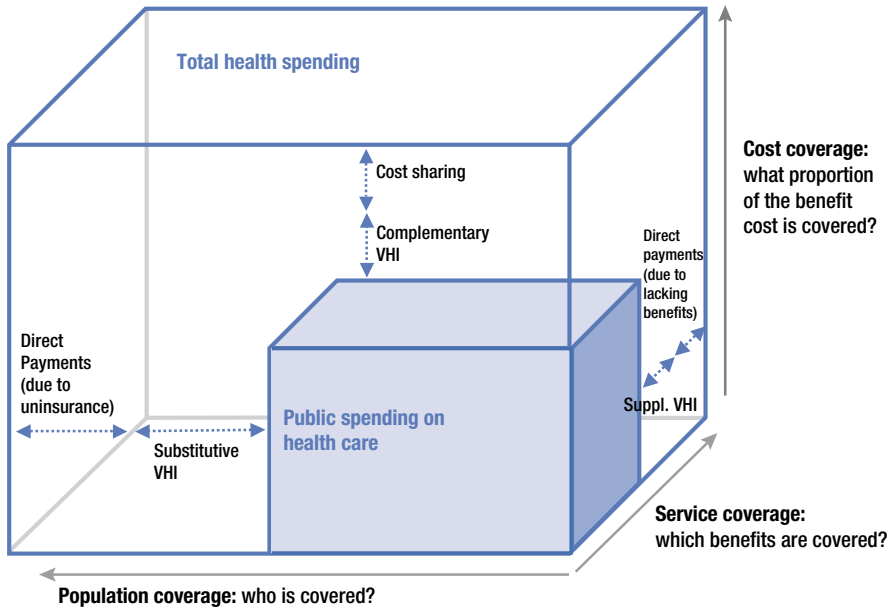
4.1 A framework to compare coverage of dental care across Europe

Health services coverage is usually displayed with the three-dimensional coverage cube (Figure 4.1). The cube, first proposed by Busse & Schlette (2007) and subsequently adopted by the WHO in their World Health Report (WHO, 2010), has been used by many scholars analysing coverage (e.g. Rice et al., 2018, Allin et al., 2020). The cube captures the three dimensions of population coverage: who is covered (population coverage), which benefits are covered (service coverage) and what proportion of the cost is covered (cost coverage). We use the coverage cube as an analytical framework to analyse and compare the coverage of dental care across Europe.

The comprehensiveness of dental care coverage varies widely across countries and is difficult to compare as countries apply and combine regulations on population, service and cost coverage differently, resulting in a patchwork of coverage rules across Europe.

- In terms of **population coverage**, there are large differences between countries and how they define their eligibility criteria. In many SHI countries people are eligible for dental care based on membership of sickness funds, while in NHS countries all residents are entitled to care. In many countries adults have limited statutory coverage for dental care, whereas dental care for children, adolescents and other vulnerable groups is covered. Children often have access to broad basic dental care. Other defined vulnerable population groups may have access to reimbursement of certain services such as dentures. These vulnerable groups are most often pensioners, special needs groups such as persons with intellectual disabilities, people with chronic conditions, and long-term care recipients, etc.

- In terms of **service coverage**, there is a great deal of variation in the approaches countries use to define their benefit packages and how explicit these baskets are. They range from very detailed (positive) lists of all goods and services available through statutory coverage to a vaguely formulated and implicit benefit package with reference to broad categories of services including dental care. Benefit baskets can also be defined negatively by listing excluded services. For example, Italy and Spain use positive and negative lists and have a structured and detailed minimum benefit basket that can be further adapted by regional health authorities. Regarding dental care, most countries rely on implicit benefit packages which are then specified by exclusion of certain treatments (e.g. cosmetic treatments, fixed prosthesis, implants, treatment of periodontal diseases), population groups (e.g. adults) and detailed requirements of cost-sharing for certain services and goods (co-insurance, deductibles, exemptions, etc.).
- In terms of **cost coverage**, dental care is not (or only partly) covered by statutory health systems in Europe. Patients often need to carry all or some of the burden and pay (part of) the costs for dental care out-of-pocket. Cost-sharing is used as a measure for cost containment and reduction of inappropriate use of service, as well as a substantial source of revenue. It may also represent formidable barriers to care for population groups with lower income. To protect vulnerable groups, countries have introduced a range of protection mechanisms including reduced rates, exemptions for certain population groups, caps on OOP spending, or complementary VHI covering statutory user charges (see Section 3.3).

FIGURE 4.1 The three dimensions of universal health coverage

Sources: based on Rice et al., 2018; Busse & Schlette, 2007

In the next section, dental care coverage is described individually for all 31 countries (EU27 + Iceland, Norway, the UK and Switzerland) according to the same framework.

4.2 Dental care coverage by country

TABLE 4.1 Description of statutory coverage for dental care in 31 countries

<p>AUSTRIA</p>	<p>Health system: Austria's compulsory health insurance schemes are mainly financed through member contributions, with a proportion of the contribution also being met by employers. Since 2019 the nine regional funds have been merged into one SHI fund, covering about 82% of the Austrian population, while self-employed workers, farmers, civil servants and railway workers remain insured by two specialist SHI funds. About 75% of total current health expenditure was financed from public sources and 17.7% of expenditure was out-of-pocket (OOP) payments in 2019.</p> <p>Coverage:</p> <p>Which benefits? The cost of basic restorative and further dental treatments (e.g. surgical treatments, some orthodontic and prosthetic procedures and materials) provided by dentists who have a contract with the SHI are generally fully covered by the SHI fund. The Austrian General Social Security Act (ASVG) states that Austrian health insurances should cover orthodontics and treatments that are sufficient, appropriate and not exceeding the necessary. Removable prostheses are covered to 75% by the SHI fund, while fixed prostheses have to be paid entirely OOP (except if removable prostheses are impossible for medical reasons). Coverage of fixed orthodontic treatments in cases of severely misaligned teeth for young people under 18 was expanded in 2015. Since January 2013 outpatient dental clinics have been allowed to provide these services at lower prices than ambulatory independent practices.</p>	<p>Costs for private dental care are borne entirely by the patient and fees are not regulated and can therefore be decided by the individual dentist. However, costs for dental care provided by ambulatory dentists without an SHI contract (20% of total dentist workforce) are usually reimbursed at 80% by the SHI fund. Personal supplementary private insurance schemes that cover the remaining and other costs do exist and are held by about 5% of the population. Premium levels for such schemes are usually risk-adjusted (mainly for age).</p> <p>Who? Persons covered by the compulsory health insurance. Children are covered by the same scheme as their parents.</p>
-----------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

BELGIUM

Health system: Health policy is a responsibility of both the federal authorities and federated entities (regions and communities). Coverage is nearly universal in Belgium, with 99% of the population covered for health services. Belgium's compulsory health insurance is implemented through five private, not-for-profit national associations of sickness funds, one fund for railway personnel, and one public sickness fund. Direct OOP payments accounted for 18.2% of overall health spending, and voluntary health insurance for 5% in 2019.

Coverage:

Which benefits? Dental care for children under 18 years is free for all services mentioned in the fee schedule (i.e. consultations, preventive treatments, periodontics, restorative care such as fillings, extractions, removable dental prostheses) and does not require co-payments. For orthodontic treatment the reimbursement is limited. For adults, services covered include preventive and minor operative treatment, extractions and removable dental prostheses (covering costs for treatment and equipment) but only up to 75–79% of the nationally agreed fees.

For persons with preferential reimbursement rates, reimbursement of oral health care is also increased. There are age limitations for the reimbursement of removable dental prostheses (for patients aged at least 50 and over) and extractions (patients above 53 years). Several treatments (such as fixed prosthodontics, most periodontal treatments, dental implants, orthodontics in adults, fluoride applications) are not reimbursed at all. Removal of dental plaque and calculus is covered once a year but is reimbursed four times per year for people with disabilities. Since 2016 reimbursement of non-preventive dental services has been made conditional upon dental contact in the previous year with reimbursement rates being reduced for restorative care, removable dentures and dental extractions.

Who? Dental care for children under 18 years is free of charge. Adults receive reimbursement of up to 75–79% of costs for dental care. For individuals with preferential reimbursement status (people with granted social benefit, people with low income), the reimbursement of oral health care is higher.

BULGARIA

Health system: Bulgaria has a compulsory social health insurance (SHI) scheme. The National Health Insurance Fund (NHIF) and its regional branches are the core purchasers of health services. A considerable proportion of the population (15% in 2019, NHIF report) remains without SHI coverage. OOP payments represent an important source of financing (37.8% of health expenditure in 2019).

Coverage:

Which benefits? The benefit package of dental care covers 14 dental services (primary, specialized and surgical) for children up to 18 years of age (seven of which require co-payment); 11 services (primary and surgical) for people above 18 years of age (six of which require co-payment; one oral examination per year is covered), and some additional services for children and adults living in specialized institutions and children with mental illness.

Some vulnerable population groups (children deprived of parental care, prisoners, young people up to the age of 18 with mental disorders) have free access to primary, specialized and surgical dental care. Users pay less than 20% of the total price for most dental services. Certain services such as radiography, high quality materials, fixed prosthodontic treatments, implants, etc., must be paid fully out-of-pocket.

Who? The NHIF fully covers dental services for some – rather small – categories of insured individuals such as vulnerable children and adults living in specialized institutions and children with mental disorders who are exempted from co-payments.

CROATIA

Health system: Croatian Health Insurance Fund (CHIF) is the sole insurer and main purchaser in the mandatory health insurance system. About 57% of the population has complementary health insurance to cover co-payments for services in the benefits package. Direct OOP payments accounted for 11.5% of overall health spending in 2019.

Coverage:

Which benefits? The basic package of dental services provided by the CHIF comprises almost all basic dental procedures (prophylactic, restorative, endodontic, basic periodontal, oral surgery, oral diseases, orthodontics up to 18 years, and a few prosthodontics) and emergency dental care.

Who? Dental care is covered for everybody, including adults. There is a fixed co-payment per dentist visit of HRK10 (€2.09 PPS; reduced from HRK15 in 2011). In addition, there is a co-payment of 20% of the cost of reimbursed dental consumables, with a minimum payment of HRK50 (€10.45 PPS). Dental prostheses are reimbursed at 20% of the costs, with a minimum payment of HRK1000 (€209 PPS) for people under 65 and HRK500 (€104 PPS) for people over 65. Exempted from co-payments are children under 18 years, students, people with a certain household income, disabled and persons with physical or mental disabilities, impairments or mental illness in accordance with social welfare regulations, disabled war veterans, family members of war veterans killed in service or held as prisoners of war. There is a cap on user fees at HRK2000 (€418 PPS) per episode of care (per issued invoice).

CYPRUS

Health system: Starting in 2019, Cyprus introduced a General Health System (GHS) with the objective to overhaul the fragmented organization of the health system and to achieve universal health coverage and reduce inefficient service provision. The incremental implementation of the GHS also aims to lower OOP expenditure by regulating the private health sector. In 2019 almost 30.6% of health spending came from OOP payments.

Coverage:

Which benefits? As of December 2020, preventive dental care has been included in the package of health care services that are provided and reimbursed by the Health Insurance Organization (HIO). All GHS beneficiaries are entitled to preventive dental care and more specifically:

- beneficiaries under 4 years old: one visit per year for oral examination and provision of information about oral hygiene, healthy eating habits, oral care and related treatment needs,
- beneficiaries 4–6 years old: one visit per year for scaling, oral examination and provision of information about oral hygiene, healthy eating habits, oral care and related treatment needs,
- Beneficiaries 6–12 years old: one visit per year for scaling, topical application of fluoride and an oral examination,
- Beneficiaries 12 years old and above: one visit per year for scaling and oral examination

Due to the limited range of dental services reimbursed by the HIO, the Ministry of Health decided that Public Dental Services (PDS) will continue to provide free treatment to low-income people (annual income less than €18 000), civil servants and government employees regardless of income, schoolchildren and all persons registered as disabled. These patients have to pay a fixed fee of €3.00 per visit. The benefit package includes a variety of dental treatment except fixed prosthetics and implants. Orthodontics is provided only for patients below 18 years who fulfil certain functional and financing criteria. People who are not covered by this free dental care regime can access dental care in the private sector and pay out-of-pocket. Although 78% of the population formally qualifies for free dental care from the public sector, in practice only 12% formally access services through the PDS. The majority purchase dental care from the private sector due to the limited working hours of the PDS and the limited number of dentists working in the PDS (only 4% of the total number of registered dentists).

Who? All GHS beneficiaries are entitled to one annual free preventive dental care examination by contracted dentists with the HIO. In addition, low-income patients, civil servants, schoolchildren and all persons registered as disabled are entitled to dental care (preventive and curative) through the Public Dental Services, but have to pay a fixed fee of €3.00 per visit. People who are not covered by this regime must pay OOP for any dental care received.

CZECHIA

Health system: Czechia operates a compulsory social health insurance system. The range of benefits is very broad and includes inpatient and outpatient care, prescription pharmaceuticals, rehabilitation and some dental procedures. In 2019, 14.2% of health spending came from household out-of-pocket payments.

Coverage:

Which benefits? Basic dental services using standard treatment and materials, including preventive dental examinations and dental prosthesis, are fully reimbursed by the public insurance system according to the annually updated Reimbursement Directive. Hence co-payments are not required for procedures defined in the Reimbursement Directive.

For superior material and treatment methods, patients have to pay the entire costs out-of-pocket, not only the price difference to standard material and treatment. Prices for above-standard procedures and materials are set by individual dentists. Prior to treatment patients have the right to get a costing plan for the above-standard dental treatment. For emergency dental care beyond opening hours a fee has to be paid upon encounter.

Who? Certain population groups are exempt from the fee for dental emergency care including persons placed in children's homes, persons placed in homes for disabled persons or for the elderly, persons proved to be in material need, or cases which require subsequent hospitalization.

DENMARK

Health system: Denmark's tax-funded health care system has a decentralized organizational structure: the national government takes the lead in regulation, supervision, general planning and quality monitoring; the regions are responsible for detailed planning, defining and delivering health services in hospital; and the municipalities have responsibility for health promotion, disease prevention, rehabilitation, home care and non-specialized long-term care. A growing proportion of Danish people purchase complementary voluntary insurance to pay, among other things, for dental care. In 2018, 14.2% of health spending was from household out-of-pocket payments.

Coverage:

Which benefits? For oral examination, scaling, individual prevention, treatment for dental caries and periodontal diseases, root canal treatment, extractions and oral surgery adult patients receive a state subsidy that can vary from 35–62%, depending on the patients' age and the actual treatment. For example, adults aged 18 to 25 years can receive a subsidy of 62% for regular diagnostic examinations and status examination (screenings, preventive care, x-rays, dental cleaning, surgery). Most adults must pay the full costs of orthodontic treatment, crowns, bridges and removable dentures themselves. In the case of dentures, the municipalities can take on 85% of the excess through the health supplement (Helbredstillæg) for pensioners and early retirement pensioners depending on the patients' financial situation and physical symptoms. Moreover, a special subsidy for oral health care can be provided to cancer patients and to people who due to Sjögren's syndrome have significantly documented dental problems. Around 30% of the adult population has private health insurance that includes dental care.

Who? A distinction is made between the scope of dental care for children and adolescents on the one hand and adults on the other. Children up to the age of 18 receive free dental care through their school, including free orthodontics. Private dental care for children is also available, but 35% of the cost of such private dental services is met by the patient. Generally, there is no free dental care for adults. Instead, a system of subsidies operates, prioritizing prevention and basic oral health care.

Welfare recipients (e.g. the disabled, the elderly and those on low incomes) can have their dental expenses reimbursed by the municipalities and those who do not receive unemployment benefit such as homeless people or substance dependents generally receive treatment free of charge. For both groups, the municipality of residence decides whether people are eligible and determines the level of co-payment.

There is a Special Dental Care programme for vulnerable groups (i.e. children and adults with reduced mobility or reduced physical and psychological functional capacity unable to utilize the general oral health service) covering oral health services for these groups. The schemes are organized by the municipalities and require a fixed maximum fee per year, except for children.

ESTONIA

Health system: Mandatory health insurance is funded by solidarity-based contributions which take the form of an earmarked social payroll tax. Nearly three quarters of Estonian health spending comes from the single payer health insurance system, while 23.9% of spending is from household out-of-pocket payments, with pharmaceuticals and dental care making up the largest part of OOP spending.

Coverage: Dental care for patients under 19 years of age is provided free of charge. However, older patients need to pay for services out-of-pocket. In 2002 dental care for adults was excluded from statutory coverage and replaced by cash benefits. During the economic crisis in 2009, as part of the austerity package, these cash benefits were further cut and made available only for some adult subgroups (persons over 63 years of age, pregnant women, mothers of children up to 1 year of age, persons with a greater need for dental treatment because of a particular condition, and persons eligible for a work incapacity pension or an old age pension).

Starting from mid-2017, however, in-kind dental care for all adults was included in the benefits package once again. A 50% co-insurance rate was implemented, with a maximum limit of €40 per year paid by the EHIF. Vulnerable persons receive dental benefits with a 15% co-insurance with a maximum limit of €85 per year paid by EHIF. However, the EHIF reimbursements to dentists often fall below market rates, especially in cities, so some dentists have abstained from signing EHIF contracts in favour of continuing private practice.

In the case of dentures, the EHIF compensates, once every three years, the amount paid for dentures by insured individuals who are at least 63 years of age or who receive an old-age pension. This is expected to further lower the out-of-pocket burden, as dental care is the second highest source of out-of-pocket expenditure.

Overall, emergency dental care is covered by the EHIF for all patients. Voluntary health insurance packages can offer up to €250 reimbursement for dental treatments.

FINLAND

Health system: Finland has a tax-financed NHS system, governed at national and local levels. The public system for oral health care has expanded gradually, starting from the youngest age groups and extending gradually to the entire population. Three quarters of health spending is financed through public sources, and out-of-pocket payments accounted for 17.4% of current health expenditure in 2019.

Coverage:

Which benefits? The Finnish NHI does not have a defined benefits package which it covers but a range of dental services is available under the public system. Private dental care is partly reimbursed by the NHS with the exception of orthodontic and prosthetic treatments (it is only reimbursed in cases when they are offered due to other diseases).

Who? Oral health services are provided to different age groups through the public and the private systems with different financial implications for patients. All children and youths under the age of 18 years are eligible for comprehensive oral health care

free-of-charge in municipal health centres, through the Public Dental Service (PDS). The care also includes preventive treatment, orthodontics and specialized care. A major reform in 2001/2002 extended subsidies for private dental services for all adults older than 46 years and they were also given access to the PDS. However, dental care for adults is not provided free-of-charge; adults pay the government set standard fees, about one third of the private sector fees. The basic cost for a dentist visit in a health centre is currently €13.30, with additional costs for procedures ranging from €8.40 for a check-up to over €200 for prosthetics.

Adults in Finland may also use private oral health care and receive a small reimbursement (14.9% of the total cost in 2017) from the NHI, with the exception of orthodontic or prosthetic treatments. There is no price regulation for private services: private providers charge on average €63 for a basic check-up (range €60–70). Reimbursement for an oral and dental examination performed by a private dentist is available every other calendar year. However, it can be paid every calendar year if the health status requires it.

FRANCE

Health system: The French health financing system is based on social insurance and an increasing share of public funding. Complementary (private) health insurance plays an important role in France for co-payments and better coverage for health care only partially covered by SHI, e.g. dental care. About 7% of total health spending comes from complementary (private) health insurance, while out-of-pocket payments accounted for 9.3% of current health expenditure in 2019.

Coverage:

Which benefits? Dental care comprises preventive and surgical treatment, a limited range of prosthetics and, if applications are approved, also orthodontic treatment. Services are reimbursed in accordance with a uniform fee schedule, as for medical treatment, with a co-payment of 30%. There is an additional payment of €1 per visit to the dentist that the patient must bear (except for children under 18 years of age; women from the sixth month of pregnancy and up to 12 days after birth, and persons with income below a certain level). About 95% of the population has a complementary (private) insurance (either compulsory or voluntary), which covers co-payments for dental care. Crowns, bridges, dentures, orthodontic treatments (over 18 years only), periodontal treatments, fluoride varnishes and implant surgery may be fully or partially reimbursed, depending on the voluntary insurance. For children up to the age of 16, 100% of orthodontic treatment is covered by the health insurance scheme, up to a maximum of €193.50 every six months.

In 2018 the SHI funds and dentists' associations reached an agreement to improve dental care coverage of prostheses starting from 2020.

The resulting scheme, named "100% Santé", features a more comprehensive coverage and price capping of a selection of dental prostheses, including bridges, crowns and movable prosthetics by SHI and complementary (private) health insurances, which has been fully operational since January 2021. Removable and fixed prostheses are fully reimbursed by the compulsory health insurance from 2021. The prices of other, non-fully covered prostheses of higher quality will also be capped (prices for implants remain unchanged). In addition, the prices of some routine conservative dental treatments will increase by 20% to 144%, with the aim to direct dental care towards the least invasive techniques. Certain essential but previously not covered treatments, such as pulp capping to promote healing in the event of a very deep cavity, will be reimbursed. Preventive dental care will also be reimbursed more comprehensively. Dental care solely for aesthetic purposes will continue to be neither covered nor capped. Some dentists with more experience continue to be allowed to charge prices higher than the regulated fees (sector 2 contractors). It is expected that over half of dental care spending should be fully covered by public or compulsory health insurance without any OOP payments by patients, while about 25% of dental prostheses should have capped prices and continue to be partially covered.

Who? All persons insured in France (either working in France or just regular residents for more than three months) have access to treatment within the scope of the national agreement between the dentists' associations and the statutory health insurance. There are various exemption regulations on additional payments for dental services for recipients of disability allowance, recipients of a work accident allowance with an inability to work of more than 66.66% and their relatives, certain diseases, but only for services to treat these diseases, and for persons with income below a certain level.

Health system: Germany has a statutory health insurance system split into public social health insurance (SHI) and (compulsory) private health insurance. Germany has a multi-payer SHI system: 87% of the population belong to 109 sickness funds. Those not entitled to sickness fund membership (the self-employed and those on high incomes) must join private health insurance companies. High levels of public expenditure on health and broad coverage of health care services result in low out-of-pocket (OOP) spending, 12.7% of health spending in 2019.

Coverage:

Which benefits? The basic entitlement to dental care of those insured under SHI is addressed implicitly in the Social Code Book V (§28) as measures for the prevention, early detection and treatment of diseases of the teeth, mouth and jaw. Specifically, prophylactic treatments (in children and the vulnerable elderly), basic dental care and surgical treatment are included in the benefits package of the sickness funds. For most services (except e.g. prosthetics or periodontal treatment), no prior authorization from an individual's sickness fund is required for dental treatment. In the case of any doubt about medical necessity, sickness funds must obtain an expert opinion on the medical necessity of a given treatment from the SHI Medical Review Board, the joint institution of all sickness funds.

Costs of dental fillings exceeding the costs of standard care must be paid by the patient. Orthodontic treatments for persons at the age of 18 or above are not covered by SHI (except in some cases such as anomalies). For children, costs for orthodontics are covered by SHI-funds, if the need for treatment is recognized by the sickness fund. For prosthetic rehabilitations including dentures and crowns, fixed subsidies are paid to patients depending on the individual number and location of teeth to be restored or replaced. The fixed subsidy amounts to 60% of the costs of standard care.

It can be increased if the insured persons endeavour to keep their teeth healthy and prove yearly dental examinations in the last five or ten years before treatment (the subsidy increases from 60% to 70% or 75%, respectively). The amount of fixed subsidy is calculated according to the cost of the most cost-effective treatment considered "standard care" for which there is a list of prices. The fixed subsidy must be paid by sickness funds even if the patient opts for a treatment other than standard care. The difference in costs for superior dental treatments (with better aesthetic or functional performance that exceed costs of standard care) must be paid out-of-pocket. According to the list of standard care, sickness funds cover is largely provided for inexpensive prosthetic strategies (e.g. simple removable dentures) but limited for more complicated treatments (e.g. implant-supported fixed dentures). Prior to prosthetic treatment, dentists must deliver a plan to the patients' sickness fund including a medical patient report, planned dental treatment and estimated costs. The sickness funds verify and approve the plan and the dentist will be reimbursed.

For individuals with low income or welfare recipients, the initial amount paid by sickness funds (60%) increases to cover all costs of standard care for prosthetic treatment (100% of costs).

Who? Membership of a sickness fund entitles a person to a package of free basic dental care, with advanced treatment options such as crowns and bridges and orthodontics sometimes requiring significant patient co-payments. People with low income are exempted from co-payments for standard care.

The SHI covers services of in-office prophylaxis for children up to 17 years old as well as outreach prophylaxis for care-dependent older people. So-called group prophylaxis is provided in schools and covered jointly by the sickness funds, the federal dental chambers and associations of public dentists as well as federal state governments.

GREECE

Health system: In 2011 the National Organization for the Provision of Health Services (EOPYY) was established to manage a single unified health insurance fund and to act as the sole purchaser for publicly funded health services delivered by the National Health System (known as ESY). In 2019, only 59.8% of health care expenditure came from public sources in Greece, whereas 35.2% was financed by households out-of-pocket, with informal payments playing a considerable role.

Coverage:

Dental care is currently almost entirely funded out-of-pocket due to a lack of public coverage for virtually all dental care. In theory, the EOPYY scheme for publicly provided dental services should have begun in January 2014. However, due to lack of contractual arrangements with dentists, and given budgetary constraints and cuts in public health expenditure, this scheme has yet to start.

EOPYY members who are not able to pay out-of-pocket for private dental services can visit ESY health units which provide prevention and treatment services but are usually understaffed. The health units also provide orthodontic treatment free of charge for minors and emergency treatment for all ages. Recently, many services (e.g. dental prosthetics) have been removed from the reimbursement list, and OOP payments for dental treatment have increased markedly.

According to the EOPYY scheme, children (6–12 years) would receive dental treatment free of charge for dental examinations, emergency treatment, scaling and fluoridation (once a year), sealants (up to four sealants), extraction of deciduous teeth and orthodontic space maintainer, if needed.

HUNGARY

Health system: Hungary has a single-payer system that is financed by contributions from employed people and employers. The Hungarian health system is highly centralized. The national government is responsible for setting strategic direction, controlling financing, issuing and enforcing regulations, and delivering most outpatient specialist and inpatient care. With the introduction of a new insurance system in 1992, dental services were not maintained to the same extent. As a result of the reorganization of insurance coverage, more emphasis was placed on individual responsibility. Many Hungarians use private insurance to receive better or more comfortable care in the fields of dentistry, gynaecology, and obstetrics in particular. OOP payments accounted for more than one quarter (28.2%) of health spending in Hungary in 2019.

Coverage:

Which benefits? Dental treatments that are fully covered for all Hungarian patients with no limitations on age include emergency dental care, dental surgery, plaque removal and the treatment of periodontal diseases and endodontics.

Regular dental examinations are also covered: twice a year for children and once a year for adults. Dental and dental surgical treatment relating to a basic medical problem and search for the origin of dental infection (referral is required) are also covered. All other dental services are not part of the statutory benefits package. Orthodontics and prostheses are not covered.

Who? Certain population groups are exempt from additional payments on treatment costs: patients under the age of 18 years, patients attending a secondary school or vocational training school, pregnant patients (from the date of confirmation of the pregnancy until 90 days after birth, but not for material and laboratory costs). Patients over the age of 62 years are also covered for a full scale of basic and specialized treatments (except technical costs).

ICELAND

Health system: The health care system is a small, state-centred, publicly funded system with universal coverage, and a partly integrated purchaser–provider relationship in which the state as payer is also the owner of most organizations providing health care services. The Icelandic Health Insurance is financed through the annual national budget. OOP payments accounted for 15.5% of health spending in 2019.

Coverage:

Which benefits? Since 2018 all children aged 0–18 years can receive necessary dental treatment and prophylaxis free of charge except for a low co-payment that is paid annually of ISK2500 (€17.73) (see also Section 4.4). To be eligible for free dental care children must have health insurance in Iceland and be registered with a family dentist. The dental care provided free of charge includes oral check-ups, preventive measures, fillings and other repair work considered to be essential dental care. Orthodontic treatment costs are not fully subsidized, but the Icelandic Health Insurance reimburses up to ISK150 000 (€1064). Since 2018, for most people aged 67 years and older, there has been a subsidy by the Icelandic Health Insurance of 50% of dental costs for oral check-ups, preventive measures, fillings and other repair work considered to be essential dental care.

Who? General dental and orthodontic treatment for adults between 18 and 66 years is generally not covered by the national health insurance, with private dentists charging according to their own fee schedules. Children up to the age of 18 years receive dental care free of charge and most people aged 67 years and older receive a subsidy of 50% of dental costs. For people in nursing homes costs are fully covered. All costs for general dental care are fully reimbursed according to the published price list for individuals with intellectual disabilities who are 17 or over. In some cases the Icelandic Health Insurance participates in the cost of dental treatment for people with mental health disabilities and if treatment is required due to serious birth defects, diseases or accidents. There is no cap on user fees.

IRELAND

Health system: Ireland's health system is a national health service funded predominantly through general taxation. The Health Service Executive (HSE), a government agency under the aegis of the Department of Health, is responsible for the management and delivery of health and social care services. Residents with an income below a defined threshold or with certain medical conditions – about 32% of the population – are eligible for a medical card. This entitles a person to access to primary care and hospital services free of charge and medicines with limited co-payments. People without medical cards can still access a wide range of community and hospital health services, either free of charge or at reduced cost. However, it is a complex system, with almost half the population purchasing private health insurance to gain faster access to care. Dental care in Ireland is via three publicly funded schemes: the Public Dental Service, the Dental Treatment Services Scheme (DTSS) and the Dental Treatment Benefit Scheme (DTBS), in addition to private care where the patient is liable for full fees. OOP payments accounted for 11.7% of health spending in 2019.

Coverage:

Which benefits? The Public Dental Service (PDS) provides free oral health care for children under the age of 16 and some special needs adults, primarily emergency treatment in state-owned premises. However, eligibility for routine dental care for children (preventive and restorative care through screening appointments in schools) is restricted to two age groups: to children typically aged 7–8 and aged 11–12.

The availability of this service varies throughout the country, having been subject to resource limitations further impacted by staff redeployment during the COVID-19 pandemic.

Under the Dental Treatment Services Scheme (DTSS) medical card holders and their dependants are entitled to one free check-up each year, two fillings (when approved by the HSE), and any necessary tooth extraction. Some other more expensive treatments such as prosthetics require the approval of the HSE. Additional treatments, for example periodontal treatment, are available to those persons with specific medical conditions after approval.

Under the Dental Treatment Benefit Scheme (DTBS) discounted dental treatment is provided to those who have paid three years of social insurance contributions (PRSI). The scheme can be accessed by employees (aged 16 years and over), retired people, and their dependent spouse/partner, if they have sufficient contributions. The scheme covers oral examination and one scale and polish (to the value of €42) annually. Full fees are payable for all other treatments.

Who? Children up to the age of 16 and medical card holders are entitled to some free oral care. Adults with certain Pay-Related Social Insurance (PRSI) contributions are entitled to a free dental check-up but must pay for any additional treatments. Adults without a medical card and PRSI, who represent a significant share of the population (about 15%), are not eligible for any scheme and have to pay for oral health services privately.

ITALY

Health system: Italy's National Health Service is regionally based, with the central government sharing responsibility for health care with the country's 20 regions. Regions enjoy substantial autonomy in how they structure their health systems within the general framework established nationally. The regions are responsible for organizing, administering and delivering primary, secondary and tertiary health care services as well as preventive and health promotion services. Most health care is publicly funded through general taxation, although co-payments may apply, especially for specialist visits, pharmaceuticals and dental care, accounting for about 23.3% of health expenditure in 2019.

Coverage:

Which benefits? Dental care is generally not covered by the SSN (National Health Service, *Serviziosanitario nazionale*) and is paid for out-of-pocket. However, a minimum set of services is included in the benefits package. These are preventive and diagnostic services, treatments for caries and associated complications, periodontal diseases, dental occlusion and dental bone-related complications and emergencies. In order to access these services, co-payments are necessary. Most dental treatments are purchased privately (OOP) by patients. Orthodontics and dental prostheses are part of the negative list (services that are covered only on a case-by-case basis, e.g. prostheses are supplied to the different categories of disabled by the Local Health Authority).

For children aged 0–14 years the SSN covers dental care including periodic dental and orthodontic visits, dental extractions, conservative care/endodontic treatment/tooth reimplantation/indirect pulp capping in post-dental trauma cases, periodontal surgery, surgical removal of odontogenic lesions, fissure sealing, oral hygiene and splinting. Also, dental care for pregnant women (but not nursing mothers) as well as dental examinations to ensure the early diagnosis of neoplastic pathologies of the oral cavity are covered.

Apart from the national benefits package, regions may also carry out their own initiatives autonomously, but must finance these themselves. For example, the north-eastern and central regions have already implemented some projects involving either the public or private sector to obtain a higher level of dental health care. In the Veneto region laboratory expenses and the cost of materials (e.g. fixed braces) must be paid directly by the patient but the co-payment for any repairs to such materials and devices is fixed at €30.

All individuals with OOP payments over €129 in a given year are eligible for a tax credit equal to roughly one fifth of their spending, but there are no caps.

Who? For children up to 14 years old, vulnerable populations, people on low income and individuals who need oral health care in some urgent/emergency cases no co-payments are required.

LATVIA

Health system: Latvia has a national health service (NHS) system with universal population coverage, general tax-financed health care provision, a purchaser–provider split and a mix of public and private providers. The health system relies heavily on OOP payments, accounting for 37.1% of total health expenditure in 2019.

Coverage:

Which benefits? Dental services, including dental hygiene, are fully covered for children under 18 years.

Benefits for minors include regular monitoring – once every three years – for 6, 12 and 17-year-olds. There is no cap on user fees for dental care.

Who? Children under 18 years (under 22 years for patients with congenital facial clefts) and asylum seekers are covered. Victims of the Chernobyl nuclear reactor accident receive 50% reimbursement for dental care and full reimbursement of dental plastic prostheses. Dental care for adults is excluded from coverage.

LITHUANIA

Health system: The Lithuanian health system is organized around a single insurance fund providing health coverage to nearly the entire population (98% in 2018). The two main revenue sources of the Compulsory Health Insurance Fund (CHIF) consist of a compulsory earmarked contribution from payrolls, and direct transfers from the state. The National Health Insurance Fund as a public body administrates the CHIF together with its five branches – territorial health insurance funds. OOP payments represent nearly one third (32.3%) of total health spending in Lithuania in 2019.

Coverage:

Which benefits? Basic (primary level) dental care: only for children under 18 years, students under 24 and people receiving income support dental care is provided free of charge.

For students, dental check-ups are covered if they are provided in contracted primary care facilities. Dental care for adults is partially reimbursed if provided by contracted dentists, except costs of fillings and disposables (except for vulnerable groups).

The level of coverage depends on the dental health needs of the patient and may vary from €561 to €1727 covered once every three years for pensioners, disabled people and people treated for cancer.

There is no cap on user fees for dental care. Voluntary health insurance does not cover dental care.

Who? Only for children, students under 24 and people receiving income support dental care is provided free of charge. Dental care for adults is covered in part from the CHIF.

LUXEMBOURG

Health system: Luxembourg operates a compulsory social health insurance (SHI) system with a single payer, the National Health Insurance. About 65% of the population has complementary VHI that reimburses cost-sharing or supplementary services. In 2019 the public share of spending on health was 85%, and nearly 9.6% was paid directly out-of-pocket by households.

Coverage:

Which benefits? Dental care is covered for conservative treatment (calculus removal, cavity treatment, root canal work, etc.), orthodontic treatment and dental surgery (tooth extraction, etc.). These services are reimbursed at an 88% cost-sharing rate after the first €66.50 is also paid by health insurance per year. Preventive dental services, dental care, orthodontic treatment and prostheses for children up to 18 years are exempted from cost-sharing. Orthodontic treatments are covered by the health insurance only if treatment begins before the patient has reached the age of 17, and only if the health insurance has given its prior consent.

For adults, prostheses are 80% covered, unless the insured person did not consult a dentist once a year for routine preventive care in the last two years. Cost-sharing does not apply for repairs and renovation of prostheses. Maxillofacial restorative prostheses are covered 100%. Some dental prosthetic treatments require authorization by the Medical Board of the Social Security. The replacement period for removable dentures stands at five years. Fixed dentures can only be replaced once every 12 years, unless ordered otherwise by a doctor, upon presentation of supporting medical documentation recognized by the Social Security Medical Board.

Who? Children and adolescents under the age of 18 years are exempt from cost-sharing for any kind of dental care. Adults pay 12% of the standard rates for conservative treatment and dental surgery. Prostheses are 80% covered, unless the insured person did not consult a dentist once a year for routine preventive care in the last two years. If cost-sharing exceeds 2.5% of annual gross income, it is covered by the National Health Insurance.

MALTA

Health system: Malta has a tax-financed, highly centralized NHS. While traditionally governance, financing and provision have been centralized within the Maltese Ministry of Health, since 2017 a new public-private partnership contract was agreed for three existing hospitals. Despite the existence of a state-run primary care system private service providers play a substantial role in providing primary care and outpatient services, resulting in high OOP payments (34.3% of total health expenditure in 2019).

Coverage:

Which benefits? Emergency dental care is freely accessible to all. Comprehensive dental care, including orthodontics, are covered for children up to age 16.

People with low income or select chronic diseases can equally access comprehensive dental care free of charge. In general, however, elective dental care for adults belongs to services that are means-tested. Therefore most dental care is paid for by patients out-of-pocket.

Who? The scope of dental care in Malta largely distinguishes between children up to the age of 16 years and adults. Children under the age of 16 are eligible to access comprehensive dental care, while other patient categories receive similar entitlements based on means-testing (social benefits recipients), as well as members of religious orders, prison inmates, and members of the police and armed forces.

NETHERLANDS

Health system: The system is financed in approximately equal shares from contributions deducted by the tax office which are dependent on income and contributions which are not income-related. A comprehensive reform in 2006 established a single private insurance market under regulated competition. Before 2006 the Dutch health system was based on social insurance combined with a private insurance scheme covering the better-off. All residents are now obliged to take out standard health insurance for a limited range of medical care. Voluntary health insurance plays a crucial role in the health system, in particular for dental care. OOP payments accounted for 10.6% of health spending in 2019.

Coverage:

Which benefits? Most dental care services are not publicly covered for adults (above 18 years) but are reimbursed in part by VHI plans, which are used by 84% of the population. However, the statutory basic tariff covers the cost of full dentures at a reimbursement rate of 75% for new prostheses and at 90% for the repair of full dentures, with an annual deductible of €385 (this deductible also applies to other health services and has to be paid by adults before the insurer reimburses). Lower jaw implants are covered under certain conditions but an additional fee of €250 per jaw applies.

Dental care in people with congenital dental defects or severe disabilities is covered by the basic tariff. Unlike dental treatment, treatments which are carried out following a referral from the dentist to an oral surgeon are covered by the basic package, with an annual deductible of €385 to be paid. There are special regulations relating to excesses and authorization to be acquired in advance (for example in the case of implants, certain osteotomies, treatments under anaesthetic, etc.).

Who? The scope of dental care in the Netherlands distinguishes between children and adolescents up to the age of 18 years and adults. The basic insurance covers the costs of preventive and curative oral health care as well as crowns and bridges of the front teeth if these are necessary due to a trauma or agenesis for children and young people up to the age of 18 years. Patients up to the age of 18 must pay for orthodontic treatment themselves unless there are severe developmental disorders, or this may be covered by the parents or parents' additional insurance. Most adults are excluded from public coverage with some exemptions for dentures.

NORWAY

Health system: The Norwegian health system is semi-decentralized with the state being responsible for specialist care and the municipalities for primary health care, long-term care and social services. Dental care is the responsibility of the counties. Public sources account for over 85.8% of total health expenditure, mostly comprising financing from the central and local governments and from the National Insurance Scheme (NIS) (around 13.9% of total health expenditure in 2019).

Coverage:

Which benefits? Except for orthodontic treatment, public dental care is free of charge for children and young people aged 0–18 years. Young people aged 19–20 years must pay 25% of the costs up to the cost-sharing ceiling (€200). Dental care is provided free of charge or reduced fees apply to mentally disabled persons living both in institutions and at home, people with chronic conditions, elderly and long-term care patients living in institutions or receiving care at home and some other special needs groups such as people with substance abuse issues. People outside these groups may also be able to access public dental care provided by the counties, but only after the needs of people in the prioritized groups have been met. Patients who experience financial difficulties can apply for support to the Norwegian Labour and Welfare Administration.

For most adults, treatment has to be paid in full by the patient, and about 70% of total spending on dental care is paid out-of-pocket. Dental care for adults is provided by private providers. Patient fees, in both public and private sectors, are not regulated by the government and the price for the patient may vary depending on their choice of dentist/dental hygienist.

Who? Most adults are largely excluded from dental care coverage. Dental care is covered for children up to 18 years, older people living in institutions or having received home nursing care, and people with certain conditions (15 diseases are listed, among them lip palate, periodontitis, oral cancer, dry mouth, traumas, tooth development disorders and bite anomalies).

POLAND

Health system: Poland's health system is based on compulsory Social Health Insurance. Health insurance contributions (an earmarked payroll tax) are the major source of public health care funding, accounting for over 71.7% of total current spending on health. OOP payments accounted for 20.1% of spending on health in 2019.

Coverage:

Which benefits? Most dental services for adults are excluded from the benefits package; only the most essential dental services are covered, including three regular check-ups per year and dental hygiene advice (once in 12 months), dental surgery and periodontology and urgent dental assistance. Once every five years patients are entitled to prosthetic treatment of missing teeth 5 to 8 with the use of removable partial dentures. In case of edentulism, patients are entitled to a full denture once every five years (persons who have undergone surgery of tumours within the facial skeleton are granted a denture without any time constraints). Patients are also entitled to free denture repair once every two years. Root canal treatment is covered for a limited number of teeth per person. The most advanced dental procedures and materials are only available in the private sector where prices are not regulated.

For children under 18 years, the benefits package of oral health services is more generous, and they are guaranteed full operative and preventive treatment and oral surgery. Dental treatment under general anaesthesia is available to all young people under 16 years of age and other youths with disabilities. Children under 12 are entitled to orthodontic treatment. Orthodontic retention appliances can be provided up to the age of 13 years of age, financed from public funds. Children and adolescents with congenital craniofacial defects are covered for full orthodontic treatment with removable and fixed appliances. Fluoride application is available for primary school pupils in grades 1–6. It is performed six times a year by school nurses.

About 88% of dental care financing comes from households' OOP spending. This is mainly because the scope of statutory dental benefits is narrow and the most advanced dental procedures (such as crowns and bridges) and materials are only available in the private sector, where prices are not regulated. There is no cap on user fees for dental care services.

Who? Certain vulnerable population groups, such as children and young people under 18 years, nursing and expectant mothers, and disabled persons, are entitled to a more generous dental benefits package (including root canal treatment).

PORTUGAL

Health system: The Portuguese health system is characterized by three overlapping systems. The NHS is universal, comprehensive and almost free at the point of delivery, financed mainly through taxation. All residents are covered, irrespective of their socioeconomic, employment or legal status. In addition, special health insurance schemes cover particular professions or sectors; these are called “health subsystems” and can be either public (e.g. for civil servants) or private (e.g. for the banking sector). Private voluntary health insurance is supplementary and speeds up access to elective hospital treatment and ambulatory consultations; it also increases the choice of provider. OOP spending is very high at 30.5% of health spending in 2019.

Coverage:

Which benefits? The NHS does not cover dental care: it is neither provided nor funded by the NHS. Most dental care is paid for out-of-pocket, either by patients themselves or through voluntary health insurance or health subsystems.

Elderly people who have insufficient funds are entitled to reimbursement of dentures (75% of expenses, up to a maximum of €250 per three-year period for purchase and repair of removable prostheses).

Who? Coverage was slightly improved with the creation of a dental voucher programme (in 2008) as part of the National Programme for Oral Health Care Promotion, which allows school-aged children, pregnant women and older people who receive social benefits to have free access to a number of dental treatments. The Programme was further extended to people living with HIV/AIDS (in 2010), and to those who needed early intervention due to oral cancer (in 2014). The Programme provides, for example, access to three “dental pay cheques” for pregnant women, which gives them the right to schedule a dentist appointment. The elderly are entitled to two of these pay cheques per year. Plans are also currently under way to integrate dentists into primary care units across the country (see also Section 4.4).

ROMANIA

Health system: Romania's health system is based on a social health insurance model. Health care services are provided by 41 districts and the capital (Bucharest), in line with centrally determined rules. In the SHI system district health insurance funds buy services from health care providers (general practitioners (GPs), specialist practices, laboratories, hospitals, home care providers and so on) at the local level. Only around 87.5% of the Romanian population was covered by SHI in 2019. Those who are uninsured are entitled to a minimum benefits package that covers life-threatening emergencies, infectious diseases and care during pregnancy. OOP payments accounted for 18.9% of health spending in 2019.

Coverage:

Which benefits? Children under the age of 18 years, young adults aged under 26 years with no income if enrolled in any form of education, war veterans and fighters in the 1989 revolution are fully covered for a limited range of dental services which include an annual examination (twice per year for children under 18); preventive treatment (oral hygiene, fissure sealants); operative treatment (including composite fillings); endodontic treatment; periodontal treatment; prosthetic treatment (acrylic removable prosthesis – once every four years, including repairs, acryl/composite crowns, acryl with metal/composite crowns); orthodontic treatment (removable and functional orthodontic appliances, space retainers); oral surgery (extractions, alveolar surgery); and examination for oro-medical problems (cancer, ulcers, etc.).

For adults 60% of the costs of extractions, tooth filling, treatment of pulpal conditions, treatment of buccal mucosa, acrylic complete and partial dentures (with metal crowns) are covered by the National Health Insurance Fund. For war veterans and fighters in the 1989 revolution the costs of these services are also covered 60% by health insurance, unless they choose a public facility where costs are 100% covered. However, it was estimated that patients pay on average 90% of the cost of their dental treatment themselves. The percentage of the national health funds' budget allocated to dental care is very low (2.3% in 2019) and only a minority of dental practices have contracts and are reimbursed by the National Health Insurance Fund, hence most oral health services are fully paid out-of-pocket.

Emergency dental services provided in public facilities are fully covered for everybody.

Who? Only certain groups, such as children under 18 years, young adults aged under 26 years with no income if enrolled in any form of education, war veterans and fighters in the 1989 revolution, are entitled to public dental care coverage for selected procedures. For patients aged over 18 years the National Health Insurance Fund covers services for 60% of the tariffs. The costs of acrylic prostheses are covered every four years. There is no cap on user fees for dental care.

SLOVAKIA

Health system: Three health insurance companies (one public and two private) operate the compulsory health system in Slovakia. Service provision is decentralized and delivered by a mix of public and private providers. Most health spending is publicly financed (80%), while about 19% of health expenditure was borne directly by patients in 2019.

Coverage:

Which benefits? The definition of the benefits package covered by SHI is vague. In most cases SHI only covers basic dental costs under the condition that the insured patient has had a periodic oral examination in the past calendar year. This condition was introduced in 2005 with the intention of promoting oral disease prevention. Only some preventive and treatment procedures are completely covered by SHI (e.g. preventive annual screenings; periodontal probing twice a year under condition of yearly preventive check-up; tooth extraction). Most dental procedures have to be partially or fully paid for by the patient.

Procedures that are partially covered by patients include e.g. specific tooth fillings and fixed dentures. A third group of dental services requires full private coverage by the patient. For example, implants, use of materials above the prescribed standard and dental care provided by dentists without SHI contract are paid for by the patient. Two of the three health insurance companies offer an additional €100 per year for procedures not covered by SHI if patients have regularly attended dental check-ups. The average patient's contribution is about 30%, depending on the type and the material of the dental prosthesis.

Who? Generally basic dental care is covered by the health insurance companies. Certain vulnerable groups such as homeless people have access to dental health care and costs are paid by the government. The SHI offers extra benefits for children.

SLOVENIA

Health system: Slovenia has mandatory social health insurance operated by the Health Insurance Institute of Slovenia (HIIS). Virtually every resident is covered under the single compulsory insurance scheme. About 95% of the population also purchases complementary VHI, mainly to cover co-payments. Although dental care is part of the benefits package, co-payments for adults are significant and were introduced in the 1970s. About 12% of health expenditure was borne directly by patients in 2019.

Coverage:

Which benefits? The basic benefits package includes most dental services for children and teenagers up to 19 years without co-payment (except for certain items such as white fillings or implants).

For adults, dental services require co-payments in all cases apart from rare emergencies (e.g. emergency treatment including tooth extraction). The co-payments range from 10% to 60%. Dental prosthetic treatments of adults require a co-payment of 90%. Voluntary supplementary insurance for co-payments is available.

Who? There is free dental treatment for children and students; for all others co-payments apply ranging from 10 to 60%.

SPAIN

Health system: Spain's national health system, the Sistema Nacional de Salud (SNS), is mainly funded by taxes. It is organized at two levels – national and regional – mirroring the administrative division of the country. Health competences are transferred to the 17 Autonomous Communities (ACs), with the national level being responsible for certain strategic areas as well as for the overall coordination of the health system, and the national monitoring of health system performance. The SNS specifies the basic coverage offered by the Spanish national health system. Public spending accounted for 71% of all health spending, OOP payments about 22% and VHI about 7% in 2019.

Coverage:**Which benefits?**

The vast majority of dental care services are not covered under the statutory health insurance. Among the treatments excluded are restorative procedures in the temporary dentition, orthodontic treatment, and extraction of restorable teeth, as well as any aesthetic treatment. The benefits package includes tooth extraction (depending on the availability of dental professionals), treatment of infections or inflammatory processes, caries prevention (application of topical fluoride, fissure sealings), and preventive measures in pregnant women (as part of the protocol for a healthy pregnancy). Most dental treatments are provided by private practices that the patients pay directly.

For children, caries prevention and counselling on hygiene measures is included as part of the services provided by primary health care paediatricians and nurses, as well as check-ups for pregnant women. However, the level of benefits strongly depends on the region. Some of the ACs have also established basic coverage for the permanent dentition of children (6 to 15 year olds) with public financing and the public or private provision of services, such as the PADI programme (see Section 7.1).

Despite significant variability across the different jurisdictions, the Spanish system universally covers hospital-based interventions due to pathologies developed in the oral cavity that require treatment by oral and maxillofacial surgeons. This also includes treatments such as dental implants and prosthodontic therapies to reconstruct function and aesthetics in patients suffering congenital diseases as well as those patients who suffered oral cancer and had to undergo a significant surgical resection.

Who? Dental care for adults is for the most part, with a few exceptions, not covered publicly. Children only receive some restorative treatments, counselling and caries prevention.

SWEDEN

Health system: The funding and provision of health care services lies largely with the county councils and regions that levy proportional income taxes on the population to cover services. All residents in Sweden are automatically entitled to publicly funded health services. Some 14% of health spending in Sweden is funded by OOP expenditure. Fees for prescribed medicines and dental services are set at a national level.

Coverage: Most dental care is provided in one of two ways. The Public Dental Service provides free dental care to children up to the age of 23, while adults above the age of 23 are covered by the Dental Care Benefits, which comprise:

- general dental care grant
- specific dental care grant (for certain groups of patients)
- high-cost protection scheme

The general dental care grant is intended to encourage adults to regularly visit their dentist for check-ups and preventive care. The grant is a fixed annual subsidy and is either SEK300 or SEK600 (€28.4 or €56.7), depending on age. The specific dental care grant is intended to provide additional support to patients having a higher risk of developing dental problems due to certain diseases or disabilities. The government regulates both the general and specific dental care grants.

The High-Cost Protection Scheme

For each dental procedure reimbursable under the high-cost protection scheme, a reference price is calculated.

The reference price is the maximum compensation payable for an individual dental procedure. If the dentist charges a higher price than the reference price for a dental procedure, the exceeding cost is paid by the patient. Treatment costs up to SEK3000 (€283) are paid by the patient in full. For treatment costs above this level, high-cost protection scheme compensation is payable:

- 50% of treatment costs with a reference price between SEK3000 and SEK15 000 SEK (€1416); and
- 85% of treatment costs with a reference price of over SEK15 000.

The high-cost protection is valid for a compensation period of twelve months. The compensation period starts from the date a reimbursable dental procedure is finalized. At the request of the patient, the care provider can register the start of a new compensation period before the previous period has expired. This may be the case if the patient is about to start an extensive treatment and wants the whole treatment covered within one compensation period.

Who? Children and young adolescents are fully covered until age 23. Adults receive an annual dental grant but have to pay between 15% and 100% of the costs of dental services (depending on price).

SWITZERLAND

Health system: Duties and responsibilities in the Swiss health care system are divided among the federal, cantonal and municipal levels of government. The system can be considered highly decentralized, as the cantons play a critical role. Switzerland ensures access to health care through a system of mandatory health insurance (MHI), which has been compulsory for all residents since 1996. Out-of-pocket spending on health is relatively high at 25.3% of total health expenditure in 2019.

Coverage:

Which benefits? Dental care is largely excluded from the MHI. Costs of dental treatment in Switzerland are only covered by the MHI if it concerns a serious non-preventable illness of the masticatory system (e.g. maxillofacial cancers) or if dental treatment is necessary due to a serious general illness (e.g. leukaemia, AIDS) or to side-effects of medication. Also costs of x-rays for specific cases and annual dental check-ups provided for children in schools are covered. Dental treatments due to accidents are remunerated if they are not covered by accident insurance (this mostly applies to those who are not in work (children and pensioners)).

Most of the population have special (private) dental insurance or additional insurance which covers a wide range of medical treatments in addition to dental services.

These insurance policies can either be purchased from MHI companies or from other VHI companies. Since 1997 additional insurance has no longer been subject to the social insurance law and is instead subject to private insurance law. Under this, the premiums are designed based on risk to an increased extent, in other words based on age, gender, state of health and health-related behaviour. The level of the premiums is linked to the scope of the insurance, and it is at the discretion of the individual insurance company to decide whether to reject cover following a relevant examination of oral health. The problem with additional insurance is that people with good oral hygiene and therefore lower costs do not obtain insurance because their annual dental costs are lower than the insurance premiums. Insurance is attractive, however, to those who have high costs. This leads to a selection of insured persons, and as a result additional insurance for dental care costs can only be concluded with high premiums.

Who? In Switzerland coverage regulation for dental care is the same for different population groups (adults, children and other vulnerable groups). Only very specific dental treatments are covered for a few patients with certain clinical conditions.

UNITED KINGDOM

Health system: Since 1999 health care has become a devolved responsibility in the four nations of the United Kingdom, influencing the way in which services are organized and paid for. However, the tax-funded NHS model is common in all four nations. OOP spending was relatively low (15.9% of total health expenditure) in 2019, but increasingly general dental practitioners are choosing not to work within the NHS and as a result OOP expenditure on oral health is a far higher percentage.

Theoretically patients can register with an NHS dentist of their choice. In Scotland and Northern Ireland, access depends, however, on whether the dentist in question accepts “registered patients” (and therefore also treatment and payment in accordance with NHS conditions).

Coverage:

Which benefits? The dental services reimbursed by the NHS include diagnosis, prevention, periodontal treatment, operative treatment, surgical treatment, dental prostheses and orthodontic treatment. In the case of some treatments, such as complicated crowns or bridges, and in the case of orthodontic treatment in adults in Scotland, where the fee for item of treatment system (previously common throughout the UK) exists, prior approval from the Dental Practice Board (DPB) is necessary. In England and Wales in 2021 there are four NHS charge bands for dental treatment which non-exempt adult patients had to pay:

- Band 1: Patient contribution of £23.80 (€28.6) in England, £14.70 (€18) in Wales, covers examination, diagnosis and consultation. If necessary, this can also include x-rays, scaling and polishing, and the planning of further treatment.

- Band 2: Patient contribution of £65.20 (€78.3) in England, £47 (€56) in Wales, covers all treatments which are covered in Band 1 and restorative, surgical, periodontal and endodontic therapy (e.g. fillings, root canal treatments and extractions).
- Band 3: Patient contribution of £282.80 (€339) in England, £203 (€242) in Wales, covers all treatments which are covered in Bands 1 and 2 and also more complex procedures such as crowns, bridges or dentures.
- Band 4: Patient contribution of £23.80 (€28.6) in England, £14.70 (€18) in Wales) covers emergency dental care.

In Scotland and Northern Ireland non-exempt adult patients contribute 80% of up to £384 (€456) to their NHS fee.

Who? In all four countries (England, Scotland, Wales and Northern Ireland) NHS treatment is free of charge to all those under 18 years of age, nursing and expectant mothers, and those with low incomes. In Wales, within the NHS, examinations are also free of those under 25 or over 60 years of age, and in Scotland examinations are free to all those under 26 years of age. This means that, if they can find a dentist who is willing to treat them under NHS contract, about 60% of “non-exempt” adults have to pay a contribution to the NHS fee paid to the dentist.

An increasing proportion of patients in the United Kingdom have additional private insurance for dental treatment. This is either in the form of dental insurance or an addition to general medical insurance.

General sources: HiT reviews; HSPM country monitoring of Estonia; EU Country Profiles, 2019; Commonwealth International Health Care System Profiles, Klingenberg et al., 2015; Rice et al., 2018; MISSOC, 2019; Widström et al., 2015; HSPM expert network.

Country specific sources: *Austria:* ÖGK, 2021; *Denmark:* Sygeforsikringen Danmark, 2021; *Cyprus:* Charalambous, Theodorou & Eaton, 2020; Charalambous et al., 2013; *France:* Ameli, 2020; L'information dentaire, 2020; Loukil, 2020; *Germany:* Ziller, Eaton & Widström, 2015; *Greece:* Damaskinos et al., 2016; *Iceland:* Sjúkratryggingar Íslands, 2019; *Ireland:* Department of Health, 2019; *Italy:* Bindi et al., 2017; *Luxembourg:* Caisse Nationale de Santé (CNS), 2021; *Netherlands:* Den Boer, Van Der Sanden & Bruers, 2020; *Norway:* Choi, 2018; Helsenorge, 2019; *Poland:* Malkiewicz et al., 2016; *Portugal:* Simões et al., 2018; *Romania:* Oancea et al., 2016; *Spain:* Bravo et al., 2015; *Switzerland:* Bundesrat, 2021; *UK:* NHS, 2021.

4.3 Patterns of dental care coverage across European countries

Children enjoy broader coverage than adults

Generally, children enjoy broader coverage than the rest of the population in most countries. They are often exempt from co-payments for dental treatments that apply to the adult population and/or are entitled to more benefits (i.e. orthodontics). Particularly in countries where dental care is explicitly excluded from coverage, or only very limited care is available, protection mechanisms are in place for children. However, in some countries such as Spain, Greece, Ireland and Italy the level of benefits for children is limited and also strongly depends on the region and/or the age. Overall, there is a large variation of the upper age limit up to which children are entitled to more comprehensive dental care services: in Italy, for example, dental care coverage applies to children aged 0–14 years while Sweden has recently increased the age of entitlement to full coverage to 23 years.

Preventive dental care from early childhood to adolescence is considered key for preventing oral diseases later in adulthood (Igić et al., 2008). In most countries targeted community oral health programmes in early year settings (i.e. kindergartens, primary schools) aim to promote oral health, for example through supervised tooth brushing, education on oral hygiene and diet recommendations, and fluoride varnish application programmes (see also Section 7.1).

Dental care eligibility for the adult population is generally less comprehensive than for children in many countries as adults are considered less vulnerable. In Spain, for example, adult dental care is not part of the basic benefits package of public coverage apart from some exemptions (i.e. emergency treatment, tooth extraction, treatment of infections). In many countries there are specific regulations for the coverage of dental services for adults. In Germany and Belgium adults with high income do not belong to the compulsory health insurance system but are free to choose from private alternatives, which set their premiums based on individual risks. In the Netherlands, where public insurance no longer exists, most adults have private insurances for most dental services. Only special dental treatments (e.g. full dentures) are covered by basic insurance for some population groups (see Table 4.1).

Many countries have protection mechanisms for vulnerable population groups

In most countries there are specific regulations for the coverage of dental services for older people and/or other vulnerable population groups (i.e. people with low income, homeless people, welfare recipients, pregnant women, persons with a greater need for dental treatment because of a particular condition, etc.). In countries where dental care is explicitly excluded from coverage or only very limited care is available, protection mechanisms are in place for vulnerable groups and/or older adults. Vulnerable population groups are often subject to specific entitlements. For example, pregnant women or people with low-income benefits are exempt from any patient charge in the UK. In Norway dental care is covered for people with chronic conditions, persons with intellectual disability and long-term care recipients.

In some countries older adults are entitled to more benefits (i.e. coverage of dentures once every three years in Estonia for people above 63 years) or special subsidies (i.e. people above 67 years receive a subsidy of 50% of dental costs in Iceland). In addition to the public dental insurance support in Denmark and Sweden for older adults, adults requiring nursing support at home, those suffering chronic illnesses and those bearing high dental costs (Sweden) have extra support towards their dental care. Dental care for older adults has received increasing attention due to the rising number of older people retaining their natural teeth and the related increased risk of tooth decay and gum disease, but also risk of dry mouth due to polypharmacy among this group (Allin et al., 2020; Bellander et al., 2021; Hempel et al., 2020; Kossioni et al., 2018; Manski et al., 2017; Schwendicke et al., 2019).

Service and cost coverage varies widely across European countries

Overall, most countries commit to a minimum level of basic dental care. This includes preventive care, such as routine oral exams, X-rays, fillings, management of gum diseases and tooth extractions. In most countries crowns and dentures require cost-sharing that is only covered by SHI or NHS if individuals meet certain financial or clinical criteria (Allin et al., 2020). To simplify comparison of dental care coverage across countries, Table 4.2 outlines a list of common dental procedures in preventive and curative dental care that are part of the benefits packages. For these specific

services coverage across countries is compared and the variation that exists is highlighted. Dental materials are listed separately as costs of these devices are often paid partly or entirely out-of-pocket. In most countries various preventive programmes targeted at children (often school-based) but also other preventive measures such as water fluoridation exist. These programmes are population-wide delivery programmes and are therefore not part of the coverage of dental services. They will be described in Section 7.1.

TABLE 4.2 List of common dental procedures in preventive and curative dental care

Preventive services	Early detection, X-rays (bitewing, periapical, full-mouth), Oral cancer screening, Removal of plaque, calculus and stains from the tooth structures, Fluoride application (varnish, gel)
Curative services	Fissure sealant, Oral hygiene, Dietary or smoking cessation advice Emergency care for pain relief Conservative dentistry and surgery: Treatment of caries/restorative care, Periodontal therapy, Sedation, Tooth extraction, Endodontics (root canal treatment, root end resection), Prosthetic treatments (removable or fixed prostheses), Orthodontic treatments, Dental implants
Dental material (some with specific cost-sharing requirements)	Dental fillings, Dental prosthesis/dentures (crowns, bridges, inlays/onlays, removable dentures), Implants, Braces

Source: authors' compilation.

4.3.1 Categories of statutory dental care coverage

Based on the overview of dental care coverage in 31 countries (Table 4.1 above), three categories with different levels of statutory coverage of dental care (by population, service and cost coverage) have been defined (Table 4.3) and the countries were classified into one of these categories.

TABLE 4.3 Categories of statutory dental care coverage

CATEGORY	LEVEL OF STATUTORY DENTAL COVERAGE
(1) Limited coverage	<ul style="list-style-type: none"> Dental care is excluded from statutory coverage for all population groups, except vulnerable population groups (children, people on low income, etc.) (population coverage)
(2) Partial coverage	<ul style="list-style-type: none"> Children and adolescents (up to age 23) are fully covered, all others are partially covered (population coverage) Basic treatments are covered for children, all dental treatments for adults require cost-sharing, prosthesis and/or orthodontics are not covered (service coverage) Cost-sharing is substantial (usually ranging between 25% and 80% of costs) (cost coverage)
(3) Comprehensive coverage	<ul style="list-style-type: none"> Adults, children (including adolescents) with entitlement to statutory health insurance are covered (population coverage) All curative services are in most cases fully covered, prosthesis and orthodontics services are partially covered (service coverage) Limited/moderate cost-sharing for selected services (up to 25% cost-sharing) (cost coverage)

Given the extensive variation within countries and across Europe of eligibility criteria and coverage regulations, this classification makes no claim to depict all the specific rules, requirements and exceptions of dental care coverage and different regional regulations (e.g. in Italy and Spain). Rather, the typology provides a simplification of the complex reality of statutory dental care coverage and variation across countries. It is worth noting that private/voluntary health insurance, which plays an important role in many countries, is not considered in this typology. Hence countries may be included in the category with the lowest level of coverage although the majority of the population is covered by private insurance. It must further be noted that in many countries the statutory coverage of dental care does not necessarily imply that people with a statutory entitlement to dental care can access it. There can be various barriers to access dental care, such as waiting times and organizational barriers, as well as acceptability and preferences (see Chapter 5). This means that comprehensive statutory coverage does not necessarily imply that people will always have access to dental care of good quality. The following grouping of countries within the three broad categories of statutory coverage for dental care must therefore be considered in light of these different dimensions of access.

(1) Countries with limited statutory coverage

Greece, Iceland, Italy, Latvia, Netherlands, Norway, Portugal, Spain, Switzerland

These countries explicitly exclude most dental care services from statutory coverage (Table 4.1), although they provide (at least in theory) some basic coverage. Preventive and restorative dental care services are available for specific population subgroups (children, older adults), and/or based on income or clinical need/health status, but coverage might vary across regions. For example, in Spain for adults only emergency dental care is covered, although this varies across regions. In Italy dental coverage is in practice limited to a minimum set of services and co-payments are required (with exceptions granted to vulnerable population groups), while dental care costs for adults without any specific entitlement are not covered. In most countries with limited coverage for dental care voluntary health insurance plays an important role in providing access to dental care and financial protection. This is, for example, the case in the Netherlands, where more than 70% of total dental costs are borne by these schemes.

(2) Countries with partial statutory coverage

Belgium, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Hungary, Ireland, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Sweden, United Kingdom.

Countries with partial coverage of dental care mostly offer comprehensive statutory coverage of dental care for children and young adults free of charge. The age limit up to which children are covered varies across countries, from 16 years in Ireland and Malta to 23 years in Sweden. In some countries such as Denmark comprehensive dental treatments for children (e.g. implants, orthodontics) require partial or full private payments. In countries with partial coverage adults are required to pay co-payments for most dental care services. The cost-sharing usually varies between 25% and 80% of treatment costs. In Estonia, for example, there is a 50% co-insurance rate with a maximum of €40 per year paid by the national health insurance. The cost-sharing range may be wider in certain countries, for example in Slovenia, where co-payments for adult dental care varies between 10% and

90%. While the scope of dental care benefits packages has remained limited in many countries with partial dental coverage, coverage for preventive care is becoming increasingly available and often varies for different age groups. For example, in Sweden fixed annual subsidies for preventive dental care and regular check-ups are paid for adults. The amount is either SEK300 or SEK600, depending on age. Similarly, in Denmark a system of subsidies for 18 to 25-year-olds prioritizes prevention and basic oral health care. In Slovakia for adults basic dental costs including biannual dental cleanings are covered only if patients have had preventive dental examinations in the past calendar year.

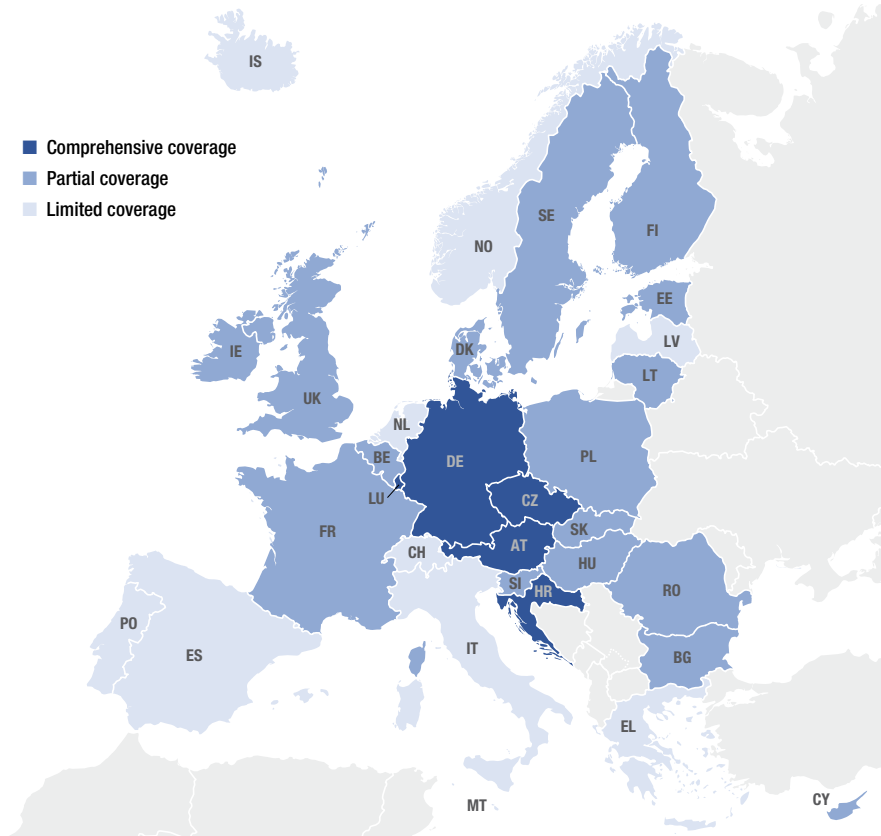
(3) Countries with comprehensive statutory coverage

Austria, Czechia, Croatia, Germany, Luxembourg

In countries with comprehensive dental care coverage many preventive and curative dental care services are included in the statutory benefits package for children up to 18 or 19 years, for vulnerable groups and for adults. Co-payments apply for adults for certain above-standard treatments such as dentures, implants, surgical extractions and prostheses. Co-payments vary largely by type of treatment but usually do not exceed 25–30% of treatment costs. In Croatia, for example, adults are required to cover 20% of costs for treatments for which cost-sharing applies. In some countries services such as orthodontics or fixed prostheses have to be paid fully or partially out-of-pocket by adults if there is no medical need (i.e. Germany and Luxembourg). Children are usually exempt from these co-payments, except for some treatments, e.g. orthodontic treatments (in Germany reimbursement depends upon on the severity of teeth misalignment). In some countries preventive measures are financially encouraged. For example, in Germany the percentage of the dental care reimbursement paid by public insurances increases over time as the patient regularly attends follow-up appointments.

Figure 4.2 provides a geographic overview of countries by type of statutory coverage category.

FIGURE 4.2 Coverage of dental care by category for statutory dental care coverage in Europe



Source: authors' compilation.

Notes: Country abbreviations – **AT:** Austria, **BE:** Belgium, **BG:** Bulgaria, **CH:** Switzerland, **CY:** Cyprus, **CZ:** Czechia, **DE:** Germany, **DK:** Denmark, **EE:** Estonia, **ES:** Spain, **FI:** Finland, **EL:** Greece, **HR:** Croatia, **HU:** Hungary, **IE:** Ireland, **IS:** Iceland, **IT:** Italy, **LV:** Latvia, **LT:** Lithuania, **LU:** Luxembourg, **MT:** Malta, **NL:** Netherlands, **NO:** Norway, **PL:** Poland, **PO:** Portugal, **RO:** Romania, **SK:** Slovakia, **SI:** Slovenia, **ES:** Spain, **SE:** Sweden, **UK:** United Kingdom.

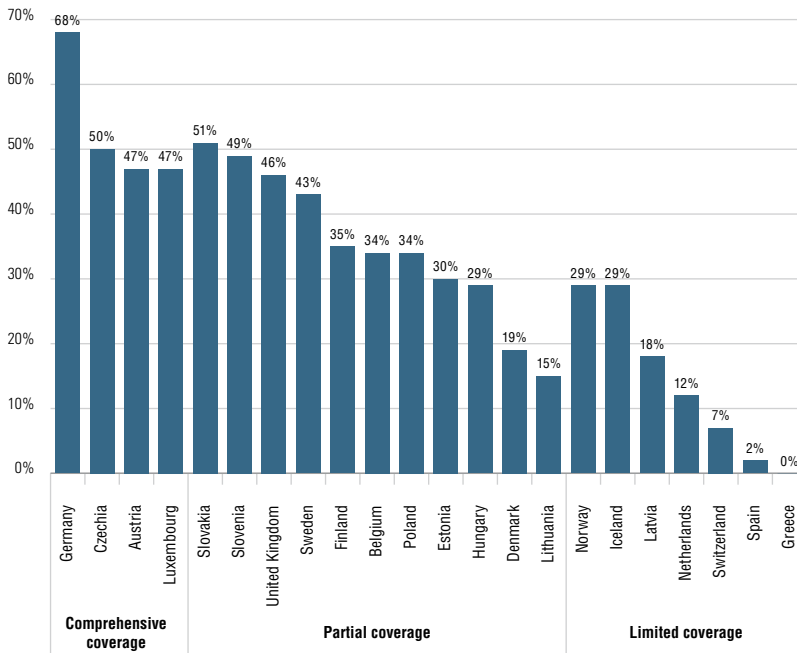
4.3.2 Level of statutory coverage and public spending on dental care

Countries with comprehensive statutory coverage generally devote a greater share of public spending to dental care compared to those with a more targeted and limited coverage. Figure 4.3 shows the level of public spending on dental care by the classification of countries' coverage for dental care presented above (limited, partial and comprehensive coverage). In countries

with limited coverage, such as Spain, Italy, Latvia, the Netherlands, Switzerland and Greece, the public share of dental spending is much lower compared to countries with comprehensive coverage (e.g. Austria, Germany).

However, within each category for coverage of dental care there is large variation in terms of the level of public spending. This is mostly related to the overall per capita spending on dental care which reflects the different level of prices (e.g. Iceland and Norway are among the countries with the highest costs per unit for dental services) and volumes of dental care (number of practising dentists per capita). Moreover, the variation is also related to service coverage for specific vulnerable groups which is often broader in countries with overall higher spending on health and dental care. In Norway, for example, various groups have free access to dental care, including people with disabilities, long-term care recipients, patients with certain conditions and patients experiencing financial difficulties. Moreover, social health insurances in Slovakia cover a relatively broad range of dental services for adults but conditionally upon regular dental check-ups, and most services require co-payments from patients.

FIGURE 4.3 Share of public spending on dental care by categories of statutory dental care coverage, 2019



4.4 Dental care coverage reforms in Europe

Various countries have recognized that limited coverage of dental care is a major barrier for equal and affordable access to oral health care services. They have therefore extended or have started to improve financial protection for oral health either by broadening the benefits basket in terms of service coverage or cost coverage for the entire population or for specific population groups, or they envisage the introduction of public dental care coverage. In light of these developments and the request formulated in the 2021 WHO resolution (WHO, 2021a) to Member States to strengthen oral health services delivery as part of the essential health services package to deliver universal health coverage, various countries seem to be devoting increased attention and importance to improving access to oral health care. Countries like Estonia, France, Germany and Luxembourg reduced cost-sharing for certain services (i.e. dental prosthesis) or population groups (i.e. children, adults). Other countries have expanded their population coverage, such as Austria, Iceland, Ireland and Sweden, where, for example, the age limit for children and young people covered was raised with the aim of improving access to dental care for children.

In **France** dental care coverage has been expanded since 2020. In 2014 about 16% of the population reported giving up dental treatment needs due to financial reasons according to EHIS 2014 (see section 5.1). There were large disparities by income level: about one in four adults in the lowest income quintile reported forgoing dental care due to costs. In addition, nearly half the population reported that they did not visit a dentist in the last 12 months in 2014. In response to these issues, in 2020 the French Government extended dental coverage, fully covering a range of dental prostheses, capping the prices of prostheses, and reducing co-payments, e.g. for metallic and ceramic crowns, ceramic bridges, etc. The goal is to have half of dental care spending fully covered by public or compulsory health insurance without any OOP payments by patients, while about 25% of dental prostheses should have capped prices and continue to be partially covered (see also Box 5.3) (OECD/European Observatory on Health Systems and Policies, 2019; Ameli, 2021; Ministère des Solidarités et de la Santé, 2019).

In 2019 the **Irish** government published a new national oral health policy, *Smile agus Sláinte* ('Smile and Health'). This was the first update to guidance relating to dental services in Ireland in over a quarter of a century. The policy has two key goals: to enable individuals to achieve improved oral health across their life course and to reduce oral health inequalities. The emphasis is on reducing the coverage gaps in the current system for the very young, the elderly and the most vulnerable groups, along with a focus on prevention. The policy envisages a reorientation of the current oral health care system towards provision in "primary oral health care". Most care will be provided by local dentists, with those requiring additional care referred to "Community oral health care services" or "Advanced oral health care centres". The policy aims to provide eight oral health care packages for children from birth to age 16, replacing the current school dental screening system. Packages of care will include examination, preventive advice, radiographs and primary dental care, i.e. fillings and extractions. Adult medical card holders aged between 16 and 25 and those over age 70 are entitled to an annual oral health care package. All other adults, except those considered vulnerable or needing additional support, will be entitled to a preventive package every two years and a routine oral health care package (i.e. fillings, extractions and periodontal (gum) care) annually. Other than children, special needs and marginalized groups, along with medical card holders, all adults must pay out-of-pocket for dental care except for PRSI entitlements (Department of Health, 2019).

In **Iceland** a new contract between the Icelandic Health Insurance and the Dental Association came into effect in 2013 and has been implemented in stages. Initially it provided dental care free of charge to children at 3, 15, 16 and 17 years of age. Additional ages were then added year by year until the agreement became fully implemented in January 2018. The aim of the agreement is to ensure that all children under 18 receive the necessary dental care, regardless of their family's financial situation. It is hoped that this agreement will bring the oral health status of children in Iceland to a level comparable to other Nordic countries. A preventive programme that covers the cost of a dental inspection for children aged 3, 6 and 12 years has also been launched.

In **Sweden** the government has commissioned an official inquiry with the aim of proposing reforms to the dental care system, focusing on

tackling inequalities. Its final report was expected to be delivered in 2020 (Observatory/OECD, 2019). A recent change in legislation has improved free dentistry for “children/adults” up to 22 in 2018 and to 23 years in 2019 (Pälvärinne et al., 2018). In Sweden slightly over 10% of people declared unmet need for dental care due to financial reasons according to a national health survey, and about one in five people according to the 2016 International Health Policy Survey of the Commonwealth Fund.

In **Estonia** the government recently extended coverage following cutbacks for adult patients in 2002 and further reductions in dental care spending following a recession in 2009. Starting from mid-2017, however, in-kind dental care for all adults was included in the benefits package again with a 50% co-insurance rate and a maximum limit of €40 per year paid by the Estonian Health Insurance Fund (EHIF). Vulnerable persons receive dental benefits with a 15% co-insurance with a maximum limit of €85 per year paid by EHIF. However, the EHIF reimbursements to dentists often fall below the market rates, especially in cities, so some dentists have abstained from signing EHIF contracts in favour of continuing private practice.

In **Portugal** the government launched an ambitious plan to expand coverage in dental care in 2016: the “National Programme for the Promotion of Oral Health”. The main objective of this programme is to guarantee the availability of public dental care services in all regions, with at least one dental practitioner in a public health centre in every Portuguese municipality. Initially started as a pilot project in 13 municipality primary care health centres, the programme has since then expanded to 91 municipalities. Out of 55 primary care health centres, 47 centres already have integrated dental care services (ODM, 2020). Initiatives to expand coverage in the field can be traced back to the introduction of “dental cheques” in 2008 as a measure to tackle socioeconomic inequalities in oral health. The cheques system has since then been enlarged to cover more vulnerable groups, namely pregnant women, children and HIV-positive patients (Direção-Geral da Saúde (DGS), 2019; Simões et al., 2018): (see Table 4.1 in Section 4.2). These actions have been reinforced by further health strategies, and one of the main objectives of the 2020 NHS strategy is to “widen and enhance coverage in primary oral care” (Direção-Geral da Saúde (DGS), 2019).

In **Switzerland** there is an ongoing debate on a reform proposal to introduce compulsory insurance for dental care. Currently, routine dental care is excluded from public coverage. Children and older adults are also not covered for dental care by the mutual health insurances (MHI). Costs of

dental treatment are only taken on by the MHI if the patient was not able to avoid the disease which caused the damage to the tooth (see Table 4.1 in Section 4.2). All basic treatments are covered only for recipients of supplementary benefits that help in cases where pensions and income do not cover the minimum living costs. Consequently, in 2019 dental care was almost exclusively financed by private spending (93% of total dental spending) of which the majority was OOP spending by households (80% of dental spending, see Figure 3.3). As a result of dental care being excluded, unmet dental needs in Switzerland are higher than in several European countries. More than one quarter of people aged 50 years and older state non-affordability as a reason for non-attendance (Listl, Moeller & Manski, 2014). According to a survey by the Commonwealth Fund in 2016, 21% of the adult population also skipped dental care due to costs. To avoid the financial risk of dental expenditure, many people purchase voluntary health insurance that reimburses dental costs up to certain thresholds depending on the type of contract. Citizens' initiatives proposed a reform to introduce compulsory dental insurance in three Swiss cantons (Grand Conseils of the Vaud, Geneva and Neuchâtel) between 2014 and 2016. The proponents suggest that financing is achieved through a 1% income contribution, equally divided between employer (0.5%) and employee (0.5%). In all three cantons popular votes rejected the introduction of compulsory dental insurance in 2018. However, these popular initiatives have triggered a heated debate at national level and raised awareness on the lack of insurance and on unmet needs for dental care. Recent estimations on the introduction of a contribution for dental care proportional to income reveal that such a move is likely to change the regressive financing structure. However, it is also argued that a compulsory insurance might lessen the quality of material and equipment due to insufficient funding and would remove personal responsibility from the majority of people to take care of their teeth, for example through daily oral hygiene (Di Bella et al., 2017; Di Bella et al., 2018).

In **Spain** coverage of dental care is directed by Royal Decree 1030/2006 of 15 September, which established the portfolio of common services provided by the National Health System. However, in Spain the coverage of dental care is also determined by the regional authorities. Thus, each region specifies legislation regarding the level of coverage of dental care. In many regions, besides hospital care interventions, only tooth extractions are

covered both for adults and children. Out-of-pocket expenditure accounted for 95% of total dental expenditure in 2019, leading to large income-related inequalities in unmet needs for dental care (Urbanos-Garrido, 2020). In 2019 the rate of unmet dental care needs was much greater among people in the lowest income quintile (12%) than those in the highest (roughly 1%). In 1990 the Basque Country in Spain developed a programme to extend coverage of dental care for children aged from 6 and 15 years, the so-called PADI programme (see Box 7.1 in Section 7.1) (Bravo et al., 2015). The success in terms of oral health outcomes and coverage of dental care of this programme has provided new objectives for the development of public oral health policies for children and for the National Health System as a whole in terms of including dental services within statutory coverage (Freire, 2003). With increasing inequalities of unmet needs for dental care by income group after the global financial crisis in 2009 (Urbanos-Garrido, 2020), the country identified dental care as a key priority for extension of health service coverage. The central government aims to achieve an agreement with regional authorities for a shared minimum basket of dental services across all jurisdictions, assisted in the initial stage by EU funding (MoH Spain, 2021 – personal correspondence). Each province will then make use of their individual structure to secure the provision of these benefits for their population through direct service provision or subcontracting to private dental clinics. Regional public health authorities can then decide to top-up the minimum benefits basket based on their preferences, possibilities and needs. As in many other countries, the lack of data informing oral health status is a significant challenge to the generation of more comprehensive oral health policies and facilitating the division of roles in terms of funding between central and regional dental public health authorities.

Some countries with partial and broad dental coverage recently extended their service coverage and cost coverage for dental benefits. For example, **Germany** expanded further the cost coverage for dental prosthesis by increasing the subsidy from 50% to 60% since October 2020. **Luxembourg** and **Austria** extended coverage for children up to 18 years. Since 2018 the co-payment of 12% for dental care in Luxembourg is no longer required for children: they have full coverage for dental care services. In 2015 Austria extended its coverage for fixed orthodontic appliances for children up to the age of 18 with considerable tooth misplacement.

Access to dental care and unmet needs

Summary

- Dental care is the main area of out-of-pocket spending in health, reflecting the fact that public coverage for dental care is generally lower than that for other health sectors in most countries. On average, more than half of total dental care spending comes from out-of-pocket payments.
- Unsurprisingly, dental care is the most frequent type of care that people forgo due to financial reasons. In Europe about 3% of the population reported an unmet need for dental examination or treatment in 2019.
- Besides financial reasons, waiting times, distance, fear of dentists and lack of time can also pose substantial barriers for access to dental care.
- International surveys show that in countries which do not (or only partially) cover dental care in their public benefits basket, out-of-pocket spending and unmet needs for dental care due to financial reasons are higher than in countries where dental care is included in the benefits basket for the general population.
- There are large inequalities in unmet dental care needs for financial reasons between low- and high-income groups. On average, of

those needing dental care, nearly 6.1% of low-income people reported having some unmet needs for dental care, compared with 0.7% for high-income people. These differences are higher than those reported for medical care.

- Limited coverage of dental care frequently leads to financial hardship for richer households who are able to pay out-of-pocket, but result in unmet needs for poorer households because they forgo or delay seeking care.
- The substantial variation in dental visits across income levels largely reflects the level of coverage in each country. However, it also reflects to some extent health service behaviour as well as health literacy.

5.1 Unmet dental care needs due to financial reasons

Generally, out-of-pocket payments may lead to financial hardship for rich households as well as poor households and have an impact on the use of dental care. A failure to seek care ultimately leads to costs being borne by individuals and the community from the consequences of untreated dental problems. The section outlines the consequences of limited coverage on financial protection and access to dental care. The analysis is based on different international surveys that report data on financial protection (EHIS, EU-SILC, Commonwealth Fund).

Dental care is heavily financed from OOP in many countries either from direct payments (i.e. for services not covered by voluntary health insurance or the statutory benefits package) or from cost-sharing (partially covered by insurance). More than half of spending on dental care (59%) comes from out-of-pocket payments (see also Section 3.2). This means there are important ramifications in terms of unmet health needs and financial hardship. In several European countries a high proportion of the population does not access dental care for financial reasons. In Europe there are two surveys that measure financial protection for health care including dental care: the annual European Statistics on Income and Living Conditions (EU-SILC) survey and the European Health Interview Survey (EHIS), which is carried

out every five years. Both surveys use different approaches to capture unmet needs (Box 5.1).

BOX 5.1 Different reporting on unmet needs in EU-SILC and the European Health Interview Survey (EHIS)

The EU-SILC asks people aged 16 years and over whether there was a time during the last 12 months when they really needed a medical examination or treatment (health care) or a dental examination or treatment (dental care) but did not receive it, and if so, for what reason (cost, distance to services and waiting time). The EHIS asks people aged over 15 years about unmet need for medical care, dental care, mental health care and prescribed medicines due to cost, distance to services and waiting time. However, both surveys target people differently. The EHIS only questions people in need of care. As a result, it provides information on unmet needs as a share of people reporting a need for care. It interrogates people about the barriers they face when accessing health care instead of thinking about the general level of unmet needs (OECD, 2019) by asking whether there was any time in the past 12 months when they needed care (medical care, dental care, mental health care and prescribed medicines), but could not afford it. Hence, the levels of unmet needs for care are generally higher mostly because the results exclude those who answered “no need for health care” (no matter whether they are met or unmet). In contrast, EU-SILC questions the population in general, providing information on unmet needs as a share of the population. As a consequence, the results of the two surveys are not directly comparable and data must be interpreted with caution due to variation in national questionnaires and differences in the way the questions asked may be understood in different contexts (OECD, 2019; Thomson et al., 2019). However, we will report on both in this section and link the results to data on patterns of use and waiting times across countries.

According to EU-SILC, in 31 countries surveyed on average 3% of people reported unmet dental care needs for financial reasons in 2019 (Figure 5.1). In Portugal, Latvia and Greece, where dental care is excluded from coverage, about 10% of the population avoided visiting the dentist due to expense – more than in all other countries. Overall, unmet needs for dental care due to financial reasons is generally higher in countries where dental care is excluded or largely excluded from the statutory benefits basket for the adult population (e.g. Denmark, Iceland, Norway, Romania, Spain, Switzerland). In countries with a more comprehensive health insurance for

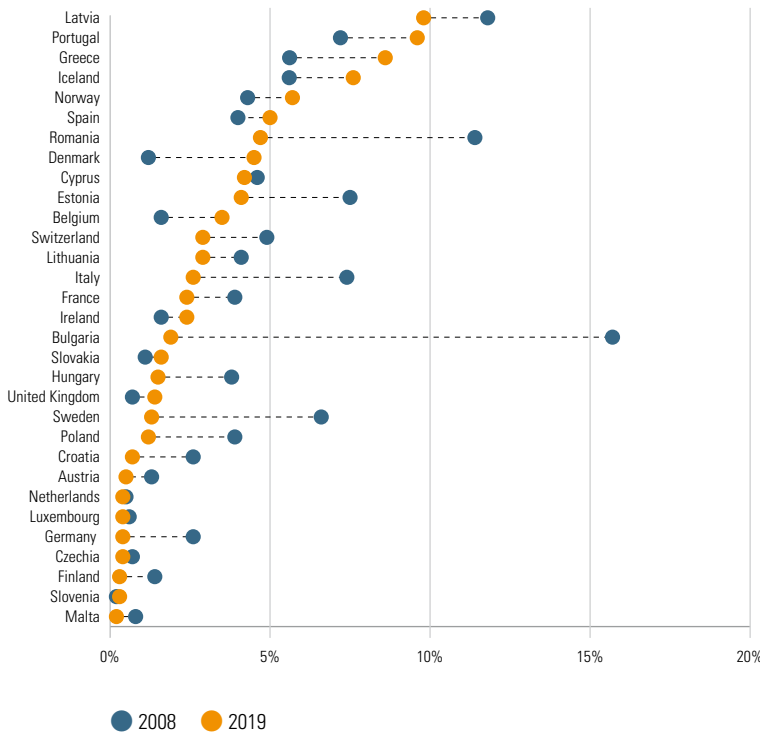
dental care (e.g. Austria, Croatia, Czechia, Germany, Luxembourg), as well as in Finland, Malta and Slovenia, the share of people reporting unmet needs is generally lower. The Netherlands, where dental care is largely excluded from state funding for those over 18 years of age, reports one of the lowest shares of people with unmet needs for dental care. This can be explained by the fact that a high share of people has additional voluntary health insurance (VHI) to partially cover dental care (83.7% of all those insured in 2018) and that prices of dental services are regulated by the National Health Authority (NZA) (Box 5.2).

BOX 5.2 Dental prices in the Netherlands: a failed experiment with free pricing

Although prices of dental treatments in the Netherlands are freely negotiable, there is a national maximum fee scale. In 2012 a short-term experiment with free price setting was conducted in which the maximum fee scale did not apply (Den Boer, Van Der Sanden & Bruers, 2020). The objective was to improve quality of care and contribute to containment of costs through increased competition. Although the experiment was originally planned to last three years, after six months a decision was made to terminate the experiment after one year as the use of preventive services declined significantly due to rising prices. The share of preventive-oriented consultations decreased significantly by 3.4% among adults and by 5.3% for children and adolescents (Trescher et al., 2020).

Looking at the trend, the percentage of people reporting unmet needs for a dental examination due to financial reasons decreased in most countries (20 out of the 31 countries) between 2008 and 2019, with the largest achievements in Bulgaria and Romania. However, a number of countries have also seen an increase in unmet needs for dental care, such as Belgium, Denmark, Greece, Iceland, Ireland, Norway, Portugal, Spain, Slovakia and the UK, between 2008 and 2019 (Figure 5.1). It must be noted that between 2005 and 2008 unmet dental care needs for financial reasons was decreasing across the EU, but this trend reversed after the beginning of the global financial crisis, especially for low-income groups (OECD, 2016).

FIGURE 5.1 Share of adults reporting unmet needs for dental examination for financial reasons, 2008 and 2019 (EU-SILC)



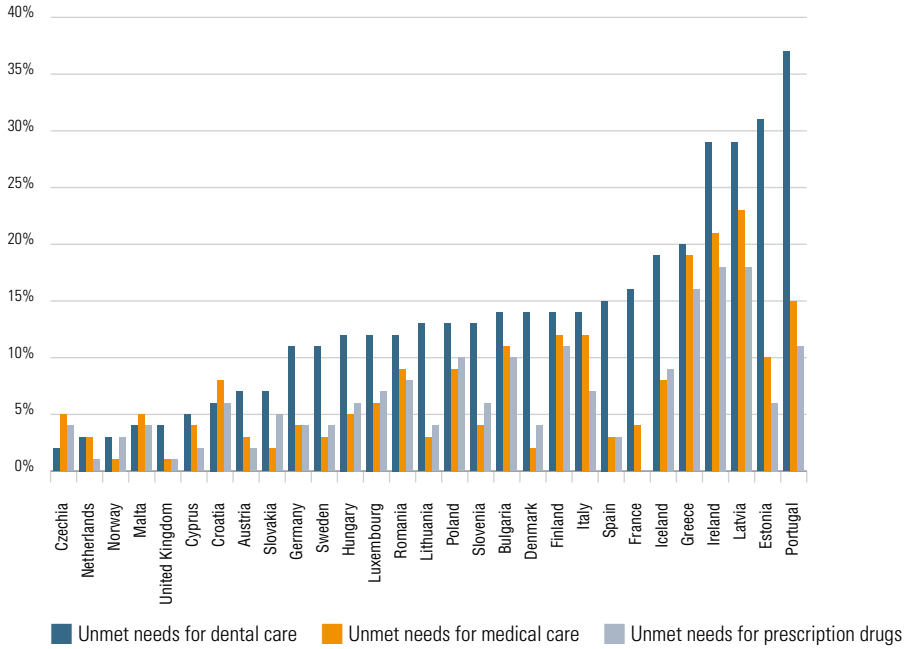
Source: Eurostat, 2021.

Notes: Data for Croatia refer to 2010; data for Iceland and the UK refer to 2018.

According to EHIS 2014 (EHIS wave 2), about 13% of the adult population reported unmet dental care needs due to costs across the 29 countries for which data are available. As in the EU-SILC data, Portugal, Estonia and Latvia report the highest shares of people with forgone dental care with 37%, 31% and 29% respectively. At the other end of the spectrum, in Czechia and the Netherlands only 2–3% of adults reported unmet needs (Figure 5.2).

Comparing unmet needs for different types of care, dental care is the most frequent type of care that people forgo due to financial reasons according to EHIS data. Only in Croatia, Malta and Czechia are unmet needs due to costs for medical care above those for dental care. On average about 7% of adults reported unmet needs for medical care and prescribed medicines due to costs in the EHIS 2014 (Figure 5.2) (OECD, 2019a).

FIGURE 5.2 Share of adults reporting unmet needs for dental care, medical care and prescription drugs due to financial reasons (EHIS 2014)

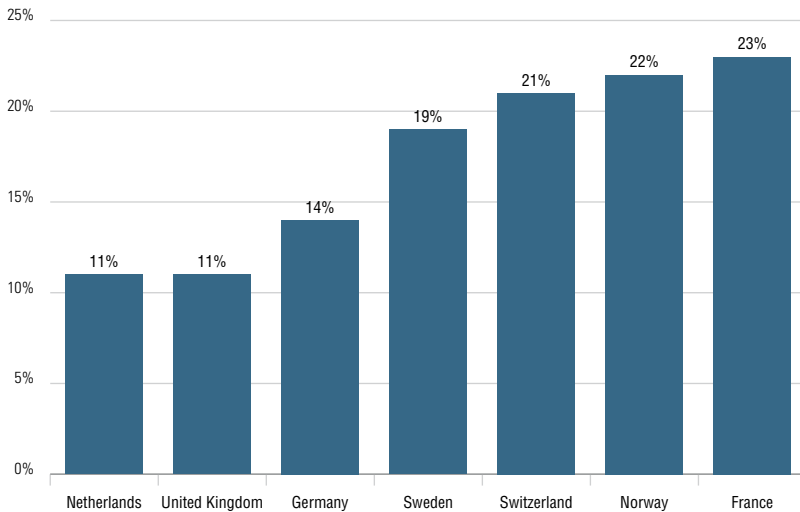


Source: OECD, 2019a (based on national health survey data).

Notes: In France and Sweden the proportions are calculated over the total adult population (including both people who have needs for care and those who have no needs), resulting in an underestimation in comparison to the other countries, where the proportions are over the adult population which has needs.

The Commonwealth Fund International Survey 2016 also contained a question on forgone dental care due to financial reasons in the last 12 months in 11 countries, out of which seven are European countries. Nearly a quarter of French and Norwegian adults reported going without dental care in the past year because of costs. Lack of access to dental care was also a concern in other countries, with about one in five adults in Switzerland and Sweden reporting this problem. Only 14% of adults in Germany and 11% of adults in the UK and the Netherlands reported this problem (Figure 5.3).

FIGURE 5.3 Share of adults who did not seek dental care because of cost in the past year, 2016

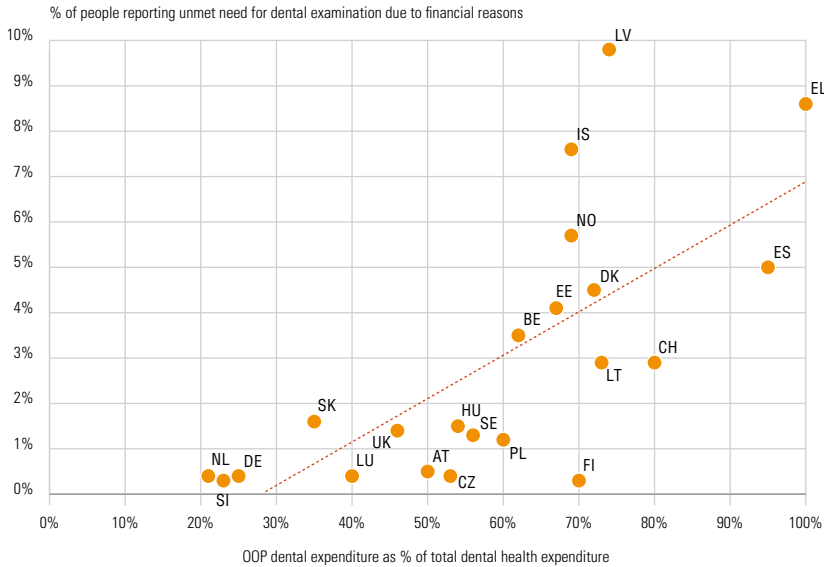


Source: 2016 Commonwealth Fund International Health Policy Survey.

When relating self-reported dental care forgone due to financial reasons and OOP dental expenditure (as a share of total health expenditure), there is an association between both variables. In countries with low OOP spending on dental care, fewer people tend to report unmet needs (Germany, the Netherlands, Slovenia). In contrast, in countries with high OOP spending on dental care, such as Greece, Latvia, Spain, Iceland, Norway and Denmark, the share of people reporting unmet needs tends to be higher (Figure 5.4).

Results across the three surveys (EHIS, EU-SILC and Commonwealth Fund) show that in countries where dental care is only partially included (or not included at all) in basic health care coverage, out-of-pocket spending and unmet needs for dental care due to financial reasons are higher than in countries where dental care is included in the benefits basket for the general population. In particular, in countries without coverage for adults and older adults, such as Latvia, Spain, Estonia, Iceland and Greece, the share of people reporting unmet needs for dental care are above average. At the other end of the spectrum are countries with good public coverage or a well-established and affordable VHI option that is purchased by the majority of the population (the Netherlands and Slovenia). In these countries the levels of reported unmet needs for dental care are generally low (Figures 5.2, 5.4).

FIGURE 5.4 Unmet needs reported (EU-SILC) vs OOP dental expenditures as % of total health expenditure, 2019



Source: Eurostat, 2021.

Notes: Country abbreviations – **AT**: Austria, **BE**: Belgium, **BG**: Bulgaria, **CH**: Switzerland, **CZ**: Czechia, **DE**: Germany, **DK**: Denmark, **EE**: Estonia, **FI**: Finland, **EL**: Greece, **HU**: Hungary, **IS**: Iceland, **LV**: Latvia, **LT**: Lithuania, **LU**: Luxembourg, **NL**: Netherlands, **NO**: Norway, **PL**: Poland, **SI**: Slovenia, **SK**: Slovakia, **ES**: Spain, **SE**: Sweden, **UK**: United Kingdom.

5.2 Unmet dental care needs due to other reasons

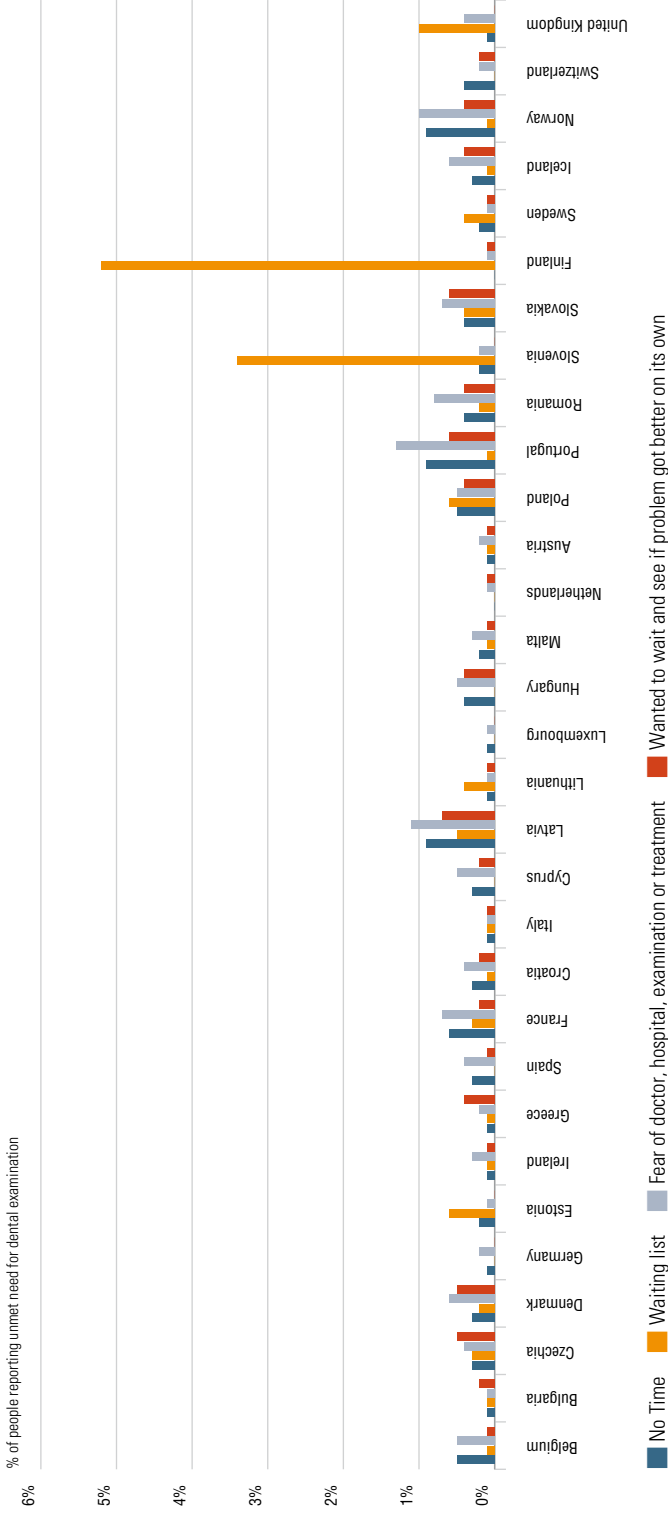
In most countries financial reasons are the most important barrier to access dental care. However, in some countries geographical distance and waiting times, as well as “reasons not related to the health care system”, such as dental phobia or lack of time, can constitute substantial access barriers and result in unmet dental care needs.

According to EU-SILC data, geographical accessibility to dental care seems to be good in all countries. Only a small minority reported unmet needs due to travel distance in the 30 countries surveyed. Waiting time is more often stated as barrier to dental care and can occur due to mismatches between demand for and supply of dental care services. These can be the result of various interrelated factors and policy design choices which may be

difficult to disentangle. These include insufficient training of new dentists, lacking attractiveness of the profession (professional development, earnings), payment structures that may disincentivize extra production or discourage investments, low productivity, cultural differences, ineffective technologies and other restrictive regulatory environments (price capping, licensing, etc). In two countries waiting times are reported as the most common reason for unmet needs before financial reasons: in Finland 5.2% of the adult population indicated waiting lists as the reason for an unmet need for a dental examination or treatment, as demand for subsidized dental care exceeds available capacity (Tuominen & Eriksson, 2012), compared to only 0.5% of the population stating financial reasons. In Slovenia 3.4% of the adult population indicated waiting lists as a reason (Figure 5.5). However, this mainly involves routine check-ups and standard dental treatment.

Non-health system-related reasons also represent barriers to accessing dental care, although to a lesser extent than financial reasons and waiting times. Fear of dentist, examination or treatment (dental phobia) and lack of time are both reasons for unmet needs for dental care. Some people also stated that they wanted to wait and see if the problem got better on its own as a reason for not receiving a dental examination or treatment the most recent time.

FIGURE 5.5 Main reasons for unmet needs for dental care other than financial reasons, 2019



Source: Eurostat (EU-SILC), 2019.

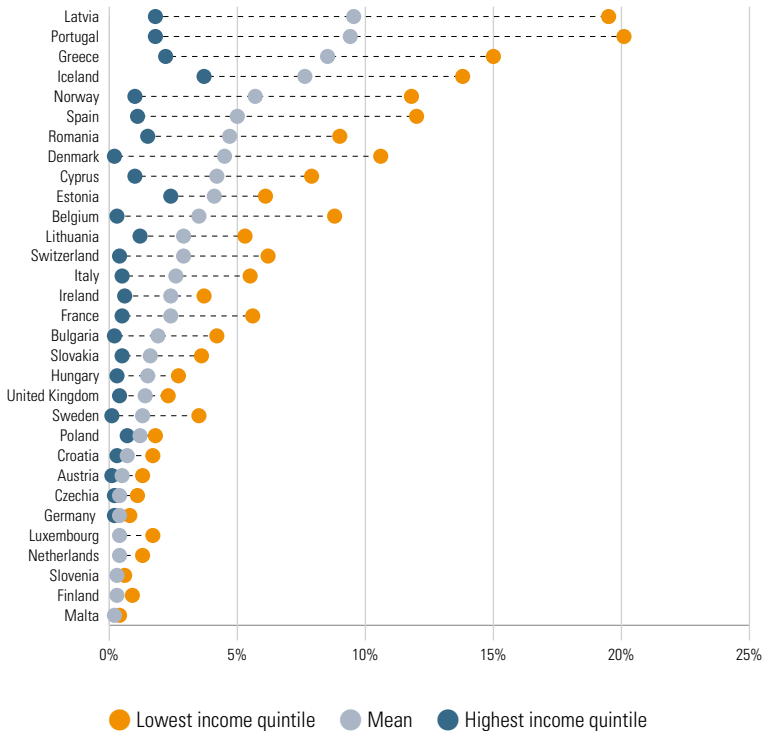
5.3 Inequality in access to dental care

As mentioned before, out-of-pocket spending for dental care can create financial barriers to dental care, resulting in financial hardship and unmet needs. Most importantly, OOP spending due to limited coverage of dental care affects various population groups in different ways. In those countries where dentistry is not covered by any form of insurance, unexpectedly high expenses on dental emergencies can present a significant burden on low-income groups and other vulnerable populations and may lead to catastrophic expenditure. This may force certain people to forgo needed oral health care, leading to unmet needs, and aggravating health inequalities even further.

The EU-SILC and EHIS data on unmet needs are disaggregated by income, gender, age, educational attainment and other factors, providing valuable insights with regard to inequalities in dental health care utilization and unmet needs. EHIS data, which only include people in need of care, find that, with the exception of a few countries, there are important gaps between the level of unmet needs experienced by income groups. In the top income quintile on average 7% of adults report forgoing dental care due to financial reasons, compared to 22% in the bottom income quintile. For medical care and prescribed medicines this gap is much less pronounced (4% and 3% in the highest income group vs 13% in the lowest income group, respectively) (OECD, 2019a), which likely can be explained by better coverage of these services.

The EU-SILC data depict even larger inequalities in unmet needs for dental care across income groups (Figure 5.6). In the bottom income quintile on average 6.1% of adults report forgoing dental care due to financial reasons, compared to 0.7% in the top income quintile. Especially in Portugal and Latvia, the gap between the share of people reporting forgoing dental care due to financial reasons in the top and bottom income quintiles is about 18 percentage points. These disparities by income levels for dental care and the high proportion of people in the bottom quintile forgoing dental care should be a source of concern given the links between oral health and systemic illnesses (Thomson et al., 2019). At the other end of the spectrum are Malta, Finland and Slovenia, with almost no income-related inequalities in unmet needs. France fares quite well in regard to unmet needs for dental care but the share of people in the lowest income group reporting unmet needs (5.6%) is just below the average. Box 5.3 highlights how recent reforms in France aim to reduce inequalities in access to dental services.

FIGURE 5.6 Share of adults reporting unmet needs for dental examination due to financial reasons, by income level, 2019



Source: Eurostat Database, based on EU-SILC.

Notes: Data refer to 2019, except for Iceland and the UK, 2018. In France and Sweden the proportions are calculated over the total adult population (including both people who have needs for care and those who have no needs), resulting in an underestimation in comparison to the other countries, where the proportions are over the adult population which has needs.

BOX 5.3 Inequalities in access to oral health care in France

Important socioeconomic inequalities in oral care have been consistently reported in France, in terms of both overall oral health and access to services (Calvet et al., 2013; Chevreul et al., 2015). The latter dimension has attracted special attention due to remarkable imbalances between younger and higher-earning individuals on the one side, and the elderly and the less financially well endowed on the other (Pegon-Machat, Jourdan & Tubert-Jeannin, 2018). Forgoing health care increases inversely with the level of income: people in the lowest income quintile are nearly three times more likely to forgo dental care than people in the highest income quintile (Célant, Guillaume & Rochereau, 2014; Chevreul et al., 2015).

Co-payments for dental care, in particular prosthetic treatment, have represented major financial barriers to dental care until now. Prosthetic and complex orthodontic treatments have traditionally not been subject to price regulation (free-pricing tier), unlike conservative dental treatments. As a result, dentists were able to charge higher prices for these services than those defined as base for reimbursement of the SHI funds. For dental prostheses, it was dependent on the insurance policy of the insured person whether the voluntary health insurance (VHI) provided a higher or lower reimbursement. Due to absence of price regulation for prosthetic and complex orthodontic treatments and the limited coverage by VHI, these services have traditionally been covered at a 20% rate of the actual costs (Azogui-Levy & Boy-Lefèvre, 2017; France Assos Santé, 2019; Or & Gandre, 2019).

Recent reforms in France, i.e. the “100% Santé” scheme, have aimed to tackle these inequalities and to improve access to dental care, especially for lower-income groups. The programme has started offering an array of prosthetics, ranging from removable to fixed prostheses as well as crowns and bridges, the cost of which will be wholly reimbursed by the compulsory health insurance starting in 2021 (see also Table 4.1; Ministère des Solidarités et de la Santé, 2019). Most importantly, the “100% Santé” scheme introduced price capping for a selection of dental prostheses, including bridges, crowns and movable prosthetics, by SHI and VHI. The reform, nevertheless, does not cover conservative procedures such as root fillings, which are still only covered at 70% of the cost by the compulsory health insurance. Furthermore, non-conservative services requiring specialist treatment as well as implants still belong to the free-pricing tier, with scant coverage for lower-income groups (Azogui-Levy & Boy-Lefèvre, 2017; France Assos Santé, 2019). Whether this major reform will have an impact on inequalities in access and use of dental care in France will become visible in survey data in the coming years.

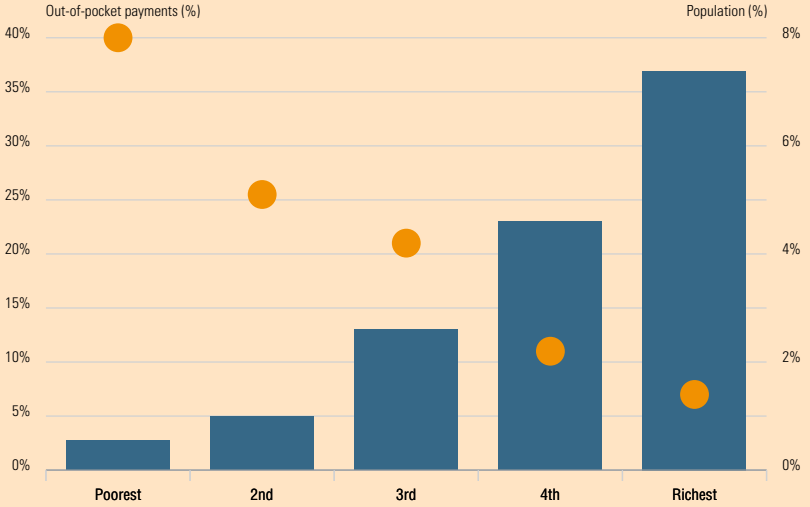
Limited coverage of dental care and OOP spending seem to affect income groups differently. Limited coverage of dental care frequently leads to financial hardship for richer households who are able to pay out-of-pocket, but result in unmet needs for poorer households which forgo or delay seeking care (Thomson et al., 2019). This again reflects the higher levels of unmet needs for dental care among poorer households than richer households. Box 5.4 illustrates how different service and cost coverage designs can impact financial hardship very differently.

BOX 5.4 Drivers of oral health inequalities: the example of Germany and Lithuania

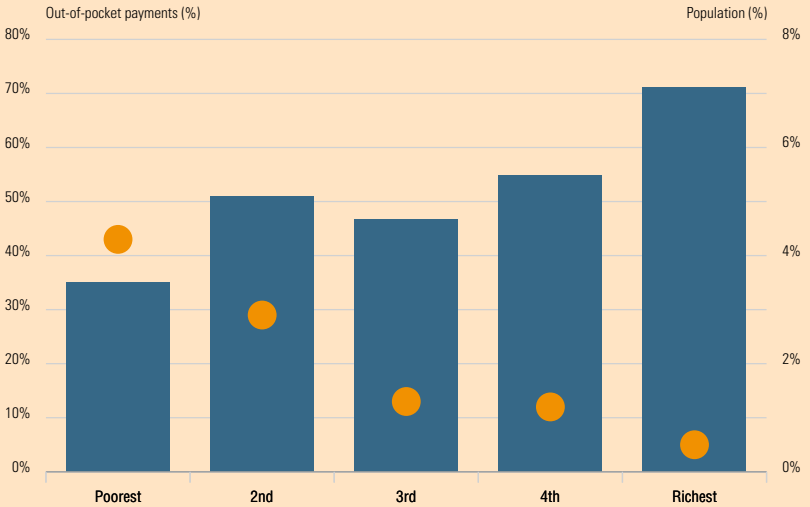
Dental coverage in terms of benefits packages and cost-sharing has major implications for financial protection. In Lithuania the main gap in service coverage is dental care for adults. They are entitled to free dental check-ups in contracted facilities but must pay the full price for fillings and materials. Only children under 18, students under 24 and people receiving income support are entitled to free treatment in public facilities. Pensioners, disabled people and cancer patients are partially exempt from prosthetic treatment costs. There are no exemptions for poor people and no cap on OOP payments. In Germany coverage of dental care is much broader. A recommended standard of care for operative dentistry and surgery is free at the point of delivery for everybody. Adults must pay at least 40% of the cost of prosthetic treatments such as crowns and dentures, with prior authorization from the public insurances. People on low incomes or receiving social benefits are exempt from this, leading to greater utilization and more equal access to this type of dental care. OOP payment for covered services, including for dental care, are capped at 2% of gross income a year (1% for people with a chronic condition) (see Table 4.1).

These coverage gaps lead to financial hardship for richer households and unmet needs for poorer households. Richer households have a greater ability to spend on dental care, while poor households with catastrophic health spending tend to forgo dental care in both countries. However, the social gradient is much steeper in Lithuania than in Germany (Figure 5.7). In Germany there is better protection against catastrophic OOP spending for lower-income groups due to special regulations for recipients of social benefits and user fee caps (Thomson, Cylus & Evetovits, 2019).

FIGURE 5.7 Share of out-of-pocket payments spent on dental care among households with catastrophic health spending and unmet needs for dental care in Lithuania and Germany



■ Dental care ● Unmet need for dental care

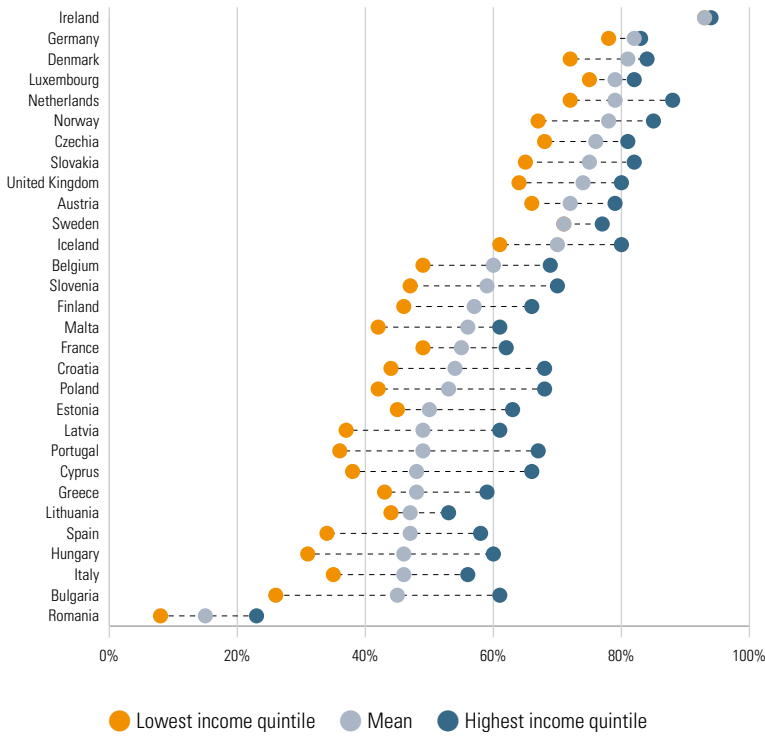


■ Dental care ● Unmet need for dental care

Source: Thomson et al., 2019.

Notes: data for Lithuania refer to 2012, for Germany to 2013.

FIGURE 5.8 Probability of a dental visit in the past 12 month by income quintile



Source: OECD, 2019a (based on national health survey data).

A different way to assess inequalities in access to dental care is the use of dental services by income group. In the absence of claims data, we use self-reported dental care visits. On average 60% of individuals aged 15 or over reported visiting a dentist in the past year, across 30 countries, as depicted in Figure 5.8. It also shows that the proportion of people who are likely to see a dentist varies by country but also by income groups within countries. The share of people in the top income quintile that are likely to see a dentist annually is significantly higher than the share of people in the bottom income quintile (OECD, 2019a). The average difference between low- and high-income groups is about 18 percentage points.

The different probabilities of dental visits and inequalities thereof across income levels largely reflect the coverage in each country (population covered, benefits covered, out-of-pocket payments required, private insurance) as depicted in Section 4.2. However, they also reflect to some extent health service behaviour as well as health literacy.

Differences in coverage of dental care may also generate differences in treatment outcomes as a consequence of limited coverage (e.g. only emergency care) and substantial cost-sharing for dental treatments for people with high and low incomes. For example, in a scenario where tooth extraction is publicly covered but endodontic treatment (root canal treatment) and dentures are excluded, a high-income person with dental pain due to a profound caries may be more likely to be able to afford a superior treatment such as an endodontic treatment and a crown to retain the tooth. In contrast, a poorer individual with the same medical condition may be more likely to opt for a dental extraction, provided that only this first part of the treatment is covered by the insurance, leading to a lower cost but the loss of a tooth. As the deterioration of oral health progresses chronically but non-linearly, this means that poorer persons initially may not feel the impact of this decision until extractions accumulate and oral function is lost.

This scenario is particularly penalizing for lower-income individuals since the restorative alternatives to compensate for advanced edentulism frequently require implant therapies which can be costly and are less likely to be covered by insurance.

Oral health workforce

Summary

- There are large differences in dentists' ratios across European countries which are associated with incentive structures but also point to different skill-mix models across countries.
- Most countries have seen an increase in the number of active dentists which is associated with the growth of the private sector and increased cross-border dental tourism, especially in new EU Member States.
- There are important disparities in the availability and distribution of dentists within countries which can exacerbate inequalities by income level in the utilization of dental services, particularly for rural populations. Some countries implement mitigating measures to increase the number of dentists in rural areas.
- Countries have very different age structures within their oral health workforce, which is also associated with migration of dentists. While some enjoy favourable replacement ratios and a relatively young dentist population, many European countries experience negative replacement rates and face the prospect of a sizeable number of their dentists retiring in the next few years.
- Migration of dentists mostly takes place between countries that train a high number of dentists per capita but offer less favourable

employment perspectives, and countries with low dentist ratios and more generous remuneration schemes.

- Other oral health professionals such as dental nurses, dental hygienists, dental therapists and (clinical) dental technicians have an important role in the provision of oral health care. There is a large variation across European countries regarding their role and scope of practice.
- Data on the oral health workforce are not collected systematically which complicates the process of making an accurate analysis and comparison of the structure of the oral health workforce both within and across countries.

6.1 Dentist densities and trends

Dentists are health care professionals that diagnose, treat and prevent diseases, injuries and abnormalities of the teeth, mouth, jaws and associated tissues by applying the principles and procedures of modern dentistry. They use a broad range of specialized diagnostic, surgical and other techniques to promote and restore oral health. Dental training that allows graduates to register as dental practitioners comprises usually between five and six years, with the study period varying across European countries (Gale et al., 2020). There exist various specializations that can be obtained in postgraduation training, such as oral surgery, maxillofacial surgery, prosthodontics, orthodontics, periodontics, endodontics, paediatric dentistry, dental public health, oral medicine and restorative dentistry, among others.

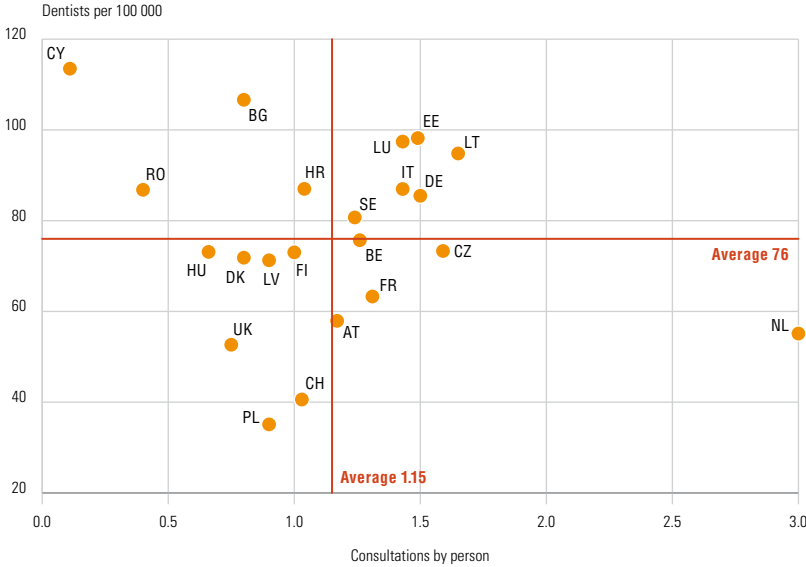
The supply and distribution of practising dentists within countries is affected by different factors such as dental training opportunities, the design of the oral health system (in particular benefits and fees paid by the statutory system, as well as incentive structures) and the demand and purchasing power of patients. As these differ across Europe, the dentist-to-population ratio varies widely across countries. However, data on the number of dentists must be treated with caution as many countries do not have a central professional registry (e.g. Italy), which makes it hard to obtain exact numbers. Moreover, some dentists may remain on the register although they are not actively practising due to retirement or unemployment, or because

they work in other settings without providing clinical care to patients. Due to these and other factors the numbers of dentists used in this section most likely do not reflect the actual numbers of dentists working in each country. There are also differences in the numbers provided within the main databases that are available.

Based on the data from Eurostat and OECD, Cyprus and Bulgaria recorded the highest ratio of practising dentists (113 and 106 per 100 000 inhabitants, respectively) in 2019, followed by Estonia and Luxembourg (98 and 97 per 100 000 inhabitants, respectively). By contrast, there were fewer than 50 practising dentists per 100 000 inhabitants in Malta and Switzerland, most notably in Poland (35 per 100 000 inhabitants) (OECD, 2021). It must be noted that data from OECD and Eurostat on the number of practising dentists include both salaried and self-employed dentists who provide direct services to patients in most countries. This is, however, not the case in Ireland, Greece, Portugal and Spain, where data refer to all dentists licensed to practise (including those who may not be actively practising), resulting in an overestimation of the number of practising dentists (OECD, 2020).

Comparing the number of outpatient dental visits to the number of dentists reveals that, on balance, there is a relation between both measures, but with some notable outliers. The Netherlands, for example, has among the lowest dentist-to-population ratio (55 dentists per 100 000), although Dutch people visit dentists most often per year in Europe (Figure 6.1). This might relate to a six-month mandatory recall system for dental check-ups for the publicly insured, which was in place until 1995, but which may have instilled a strong tradition of regular preventive check-ups. Romania and Bulgaria seem to be outliers with above average dentist-to-population ratios but relatively few annual dental visits per population. This might be related to the fact that these countries train many dentists who leave the country due to lack of employment in their home country and better opportunities abroad (see below). Overall, there are on average about 76 dentists per 100 000 inhabitants across the 27 countries for which data were available (Figure 6.1).

FIGURE 6.1 Number of practising dentists (per 100 000 population) and dental visits per person per year, 2019 (or latest year)



Sources: Eurostat, 2021; data for Spain: Instituto Nacional de Estadística (INE), 2021b.

Notes: For numbers of dental visits for France and the UK the latest available year is 2018; for Italy, Spain and Switzerland the latest available year is 2017. For dentists per population the latest available year for the UK, Sweden, Spain is 2018, for Luxembourg and Poland 2017, for Finland 2014. Data for Austria, Cyprus, Hungary, Serbia and the United Kingdom do not cover consultations privately financed or provided in the private sector, also resulting in underestimations.

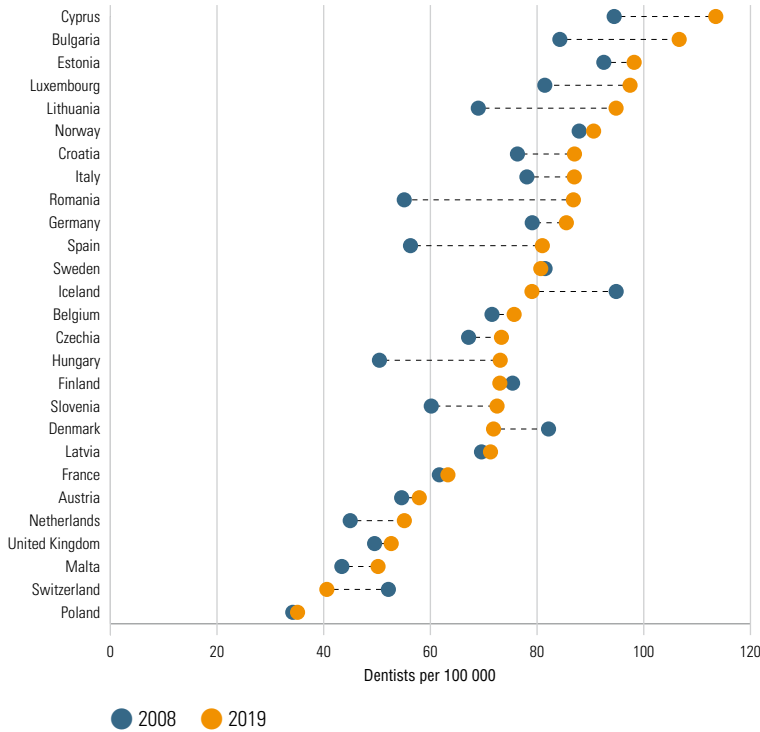
Country abbreviations – **AT**: Austria, **BE**: Belgium, **BG**: Bulgaria, **CH**: Switzerland, **CY**: Cyprus, **CZ**: Czechia, **DE**: Germany, **DK**: Denmark, **EE**: Estonia, **FI**: Finland, **EL**: Greece, **HR**: Croatia, **HU**: Hungary, **LV**: Latvia, **LT**: Lithuania, **LU**: Luxembourg, **NL**: Netherlands, **NO**: Norway, **PL**: Poland, **RO**: Romania, **SE**: Sweden, **UK**: United Kingdom.

Most countries have seen important increases in the numbers of practising dentists since the end of the 1990s, including countries such as Estonia and Cyprus, where the numbers of dentists were already very high in the late 1990s. The new EU Member States have seen the highest relative increases in practising dentists between 2008 and 2019 (Figure 6.2). This results from the development of the private sector and the emergence of private dental schools, as well as from increased cross-border dental tourism. Regarding the latter, patients from more economically developed countries come to Eastern European countries for dental treatment, where the cost of the dental treatment is considerably lower (see Section 7.5). Especially in Romania, Spain and Hungary, the dentist-to-population ratio increased

by on average 50% between 2008 and 2019. In Spain this growth was seen despite a relatively low demand for oral health care services (Bravo et al., 2015) and is mostly likely linked to the increase of corporate dentistry in the country. This continuous increase is also due to high numbers of new graduates, especially from private universities and from Central and South America, leading to oversupply of dentists. In 2018/2019, 11 out of 23 dental schools in Spain were private institutions, which usually do not control the number of students entering the schools (CECDO, 2022). As a result, Spanish dentists have continued to migrate to other European countries such as the UK (Bravo et al., 2015). In Ireland (with 58 registered dentists per 100 000 (Department of Health, 2019), no data available in Eurostat) the number of registered dentists increased by 21.5% between 2005 and 2015 and many of them leave to work in the UK (Woods et al., 2017), often as newly qualified graduates who later return to Ireland. In Romania there is also an overproduction of dentists given the high numbers of dental faculties (13, out of which four are private dental schools) and new graduates every year (1500 dentists). Many of them migrate to work in other European countries (Germany, Italy, the UK,) as they find no employment in Romania (CECDO, 2022; Oancea et al., 2016).

In most Western European countries, the dentist-to-population ratios only increased slightly or even decreased between 2008 and 2019 (Figure 6.2). Particularly in many Nordic countries the numbers of practising dentists decreased or remained stable. This has several explanations. The number of students admitted to undergraduate dental studies was significantly reduced in all Nordic countries in the 1980s and 1990s. Although dental schools in these countries recognized this trend and raised the enrolment numbers of students (Fiehn, 2002), the number of dentists continued to decrease as there were more dentists retiring than were being educated (Kravitz, Bullock & Cowpe, 2015). At the same time, in all Nordic countries there were attempts to train high numbers of dental hygienists and increase task-sharing to make care more prevention-oriented, efficient and cost-effective. Indeed, in 2015 the numbers of dental hygienists in Nordic countries were among the highest in Europe (Widström, Agustsdottir, Byrkjeflot, Pälvärinne, & Christensen, 2015). In Iceland, the number of dentists decreased as many dentists migrated to Norway for economic reasons during and after the economic crisis (Widström et al., 2015).

FIGURE 6.2 Practising dentists per 100 000 inhabitants, 2008 and 2019 (or latest available year)



Sources: Eurostat, 2021; data for Spain: Instituto Nacional de Estadística (INE), 2021b

Notes: For the UK, Sweden and Spain the latest available year is 2018, for Luxembourg and Poland 2017, for Finland 2014. For Malta the first available year is 2009, for France 2011 and for Italy 2013.

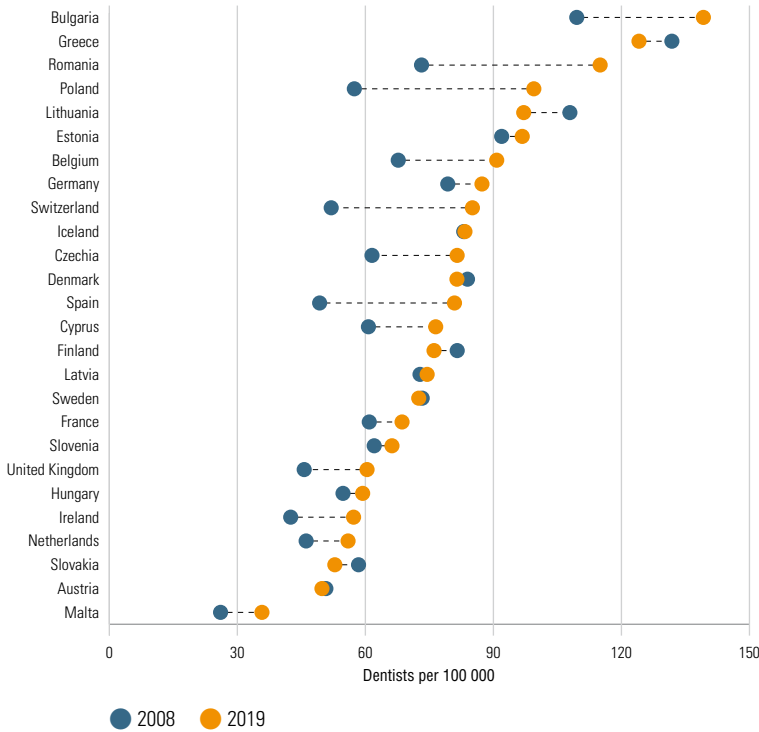
To address the undersupply of dental professionals and to meet future need and demand for (cross-border) oral health care, countries have taken different approaches in their educational systems for dental practitioners. While many countries (mainly northern and western EU countries) only recognize undergraduate dental training through public universities, others (mainly Poland, Hungary, Baltic countries, Portugal and Spain) have decided to allow private universities to grant these protected titles (Gallagher & Eaton, 2015). These policies are likely not only to respond to the increased demand for dental care by cross-border patients (see Section 7.5) and the lack of sufficient dental workforce in these countries, but also to compensate for the migration of local dental professionals who are attracted by better working conditions in other countries. Some of these private universities offer programmes in English to encourage foreign-EU nationals to access a medical career by studying abroad.

The Council of European Chief Dental Officers (CECDO) also regularly collects information from national chief dental officers (CDOs) on the numbers of oral health professionals, including the numbers of registered and active dentists (mostly including those in private practice, employed in practices and employed outside dental practices), as well as other oral health care professionals (see Section 6.3). The most recent data are publicly available (CECDO, 2022). Many of the above-stated concerns about reliability and comparability also apply to these data, e.g. dentists who are in retirement may still be counted as active.

When comparing data on dentists from OECD to data from CECDO, the trends are broadly analogous. For example, the relatively strong increases in a number of countries are similar (e.g. for Malta, Spain, Romania and Bulgaria). However, in some countries the trends as depicted in the data are inconsistent. For example, CECDO data indicates substantial increases of active dentists for Poland and Switzerland, which the data from OECD do not show.

Looking at dentist rates in 2019, there are a number of inconsistencies for some countries. While the average number of dentists across the countries is similar (76 dentists per 100 000 inhabitants across the 27 countries according to OECD, compared to 79 dentists for 26 countries included in the CECDO database in 2019), there are important discrepancies in the dentist ratios for Belgium, Bulgaria, Malta, Hungary, Poland, Romania and Switzerland. Smaller differences (ranging between 7 and 10 dentists per 100 000) are to be found for Austria, Czechia, Denmark, Sweden and the UK. For the remaining countries the number of dentists per population is largely comparable (Figure 6.3).

FIGURE 6.3 Number of active dentists per 100 000 population, 2008 and 2019, using CECCO data



Source: CECCO database, 2009, 2022.

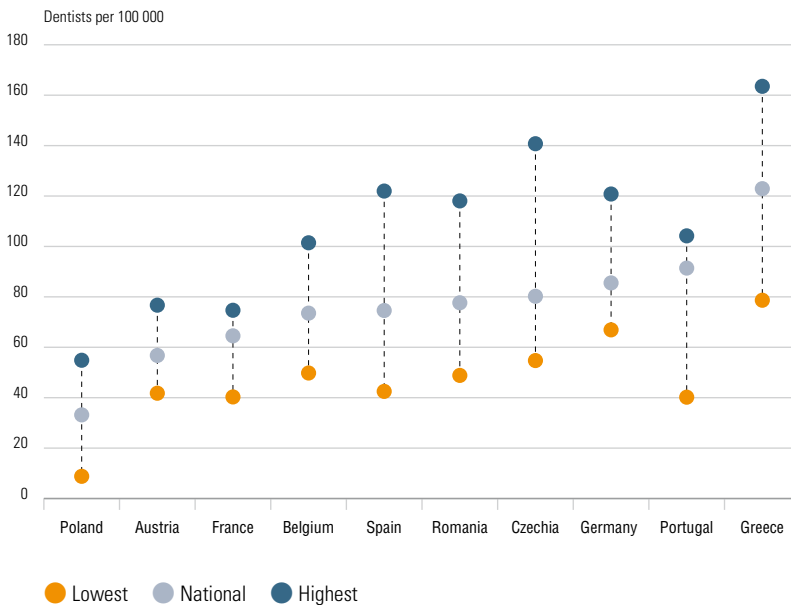
Notes: 2019 data for the UK are estimates.

6.2 Geographical distribution and ageing of dentists within countries and implications for access to dental care

Overall, dentists are not equally distributed within most countries, with many of them concentrated in urban areas. Hence, national high dentist-to-inhabitant ratios do not necessarily reflect good geographical access to dental care (GFDI, 2018). The geographical imbalances in Austria, France, and Spain provide examples of concentration of dentists in urban areas. In Austria, Vienna hosts about a third of the country's dentists for only a fifth of the population (GFDI/VDDI, 2018; Statistics Austria, 2020). Similarly, in France a third of all dentists work in Paris alone, although the city is only inhabited by 18% of the French population (GFDI/VDDI, 2018). In Spain a

third of all dentists are located in Madrid and Barcelona, with the two cities only accounting for a fifth of the Spanish population. Also in Spain, the distribution of dentists shows the highest variation of all health professionals across the Autonomous Communities (ACs), ranging between 43 dentists per 100 000 inhabitants in Melilla and 122 in Madrid in 2015 (Eurostat, 2019; GFDI/VDDI, 2018; Instituto Nacional de Estadística (INE), 2021a). In Poland there are also strong disparities across the regions, which are strongly affected by cross-border dental care. Although the national density is comparably low (35 dentists per 100 000 inhabitants), in 2015 it ranged from 8.8 dentists in the region of Greater Poland in west-central Poland to 54.9 dentists per 100 000 in Lubuskie, the border region with Germany (Figure 6.4). This maldistribution results, among other things, from the growing number of patients visiting Poland for health care, mainly from Germany and the Scandinavian countries, with the most popular medical services being dental care services (Sowada et al., 2019).

FIGURE 6.4 Dentist distribution at national level and by region (NUTS2) with lowest and highest density per 100 000 population in 10 European countries in 2015



Source: Eurostat, 2021.

Note: NUTS = Classification of Territorial Units for Statistics.

Regional disparities of dentists can lead to inequality in access and utilization of dental services by rural populations. A systematic review by Reda et al. (2018) showed that individuals in rural areas tend to visit dentists significantly less than people living in urban areas. In particular older adults living in rural areas tend to take up public oral health care less often compared to urban areas, as shown by the TILDA study from Ireland, as they are often less aware of dental services and have a lack of understanding of their eligibility for oral health care services (McCarron, Haigh & McCallion, 2017). However, a study from France has shown that the higher the density of dental practitioners, the smaller the role of income on the utilization of dental services for the elderly becomes (Lupi-Pegurier et al., 2011).

Several countries including France, Czechia, Romania and Bulgaria are currently taking measures directed at mitigating the effects of geographical disparities, and increasing the numbers of dentists in rural areas. France has budgeted €400 million to finance existing and new dental practices in rural areas (GFDI/VDDI, 2018). Czechia will also provide funding, with up to €3.9 million in grants to expand coverage in rural areas of the country (GFDI/VDDI, 2018). Romania and Bulgaria, on the other hand, are currently assessing EU-financed pilot projects delivering dental care services with equipped vans to rural populations with no access to practices (European Commission, 2020). Overall, these findings highlight the importance of the availability of dental services in rural areas and for spatially specific health services planning.

As with general medicine, the ageing of the dentistry workforce has become a problem in many countries, or will become an issue for dental care provision in the mid and long run. In Europe the picture is very different amongst countries. While some enjoy favourable replacement ratios and a relatively young dentist population, many European countries experience negative replacement rates and face the prospect of a sizeable number of their dentists retiring in the next few years. For example, France, Italy and Germany have a high average age of about 48 years of their dentist workforce (GFDI/VDDI, 2018; Observatoire National de la Démographie des Professions de Santé, 2013; Odontoiatria33, 2016).

By comparison, Spain, England and Poland show more positive figures. In the case of Spain, the average age of its dentistry professionals (41) and the share of dentists aged over 55 (24.7%) are both remarkably lower than those

of France and Italy (INE, 2020). Similarly, Poland predicts a 17.8% increase in the number of dentists in the next twenty years (Portaldentystyczny, 2018). Lastly, England's NHS dentistry workforce is relatively young, with only 22.6% of its professionals above the age of 55 in 2020 (NHS Digital, 2021), which is partly related to a high share of foreign-trained dentists. In 2019 about 16% of registered dentists in the UK were foreign-trained EU nationals, with dentists from Poland, Spain, Romania and Sweden accounting for nearly 40% of the EU registrants (Eaton, 2020). However, with the UK leaving the European Union, a large number of the EU-trained dentists are expected to leave the country (Eaton, 2020; O'Dowd, 2019). Other high-income countries in Europe have also become net receivers of dentists trained in other countries. In Norway, for example, the number of foreign-national dentists almost tripled between 2003 and 2019 (Statistics Norway, 2020). In Finland more than half of the newly licensed dentists in 2012 were foreign-trained, with the majority stemming from the Baltic countries and Bulgaria (Dental Tribune International, 2012).

6.3 Other oral health professionals

The following section briefly describes different professional roles in oral health care other than dentists in Europe. It must be noted that professional titles and scope of practice can be very different from one country to another. The section also compares rates of oral health professionals based on the CECCDO data that are regularly collected from chief dental officers by the Council of European Chief Dental Officers (CECCDO, 2022).

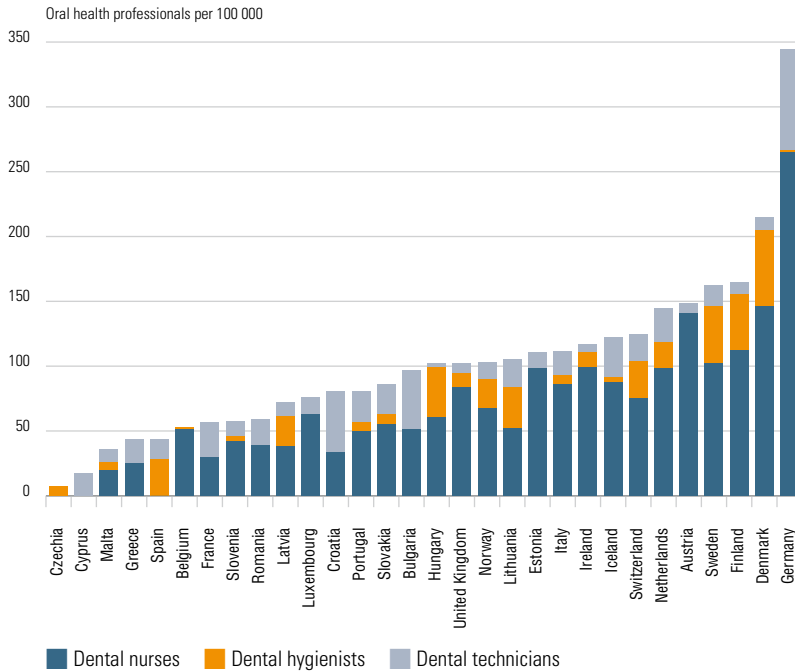
In many European countries oral health professionals other than dentists are increasingly providing oral health care, including dental assistants/dental nurses, dental therapists, dental hygienists, clinical dental technicians and orthodontic auxiliaries. Across Europe there is a large diversity regarding the numbers of other oral health professionals, their training, professional recognition and their scope of practice. Many countries such as Austria, Germany, Ireland, the Netherlands, Sweden and the UK have a strong tradition of engaging with auxiliary dental workers. Dentists usually work together with dental surgery assistants/nurses. In other countries, such as in France, Poland and Romania, many dentists do not work with a dental nurse

(chair-side assistant) (Eaton et al., 2019). These differences are also reflected in the numbers of oral health professionals per 100 000 population from the database of the Council of European Chief Dental Officers (CECDO, 2022). According to the CECDO database, dental nurses are the largest professional group, with on average 74 dental nurses per 100 000 population across the countries with available data, while there were only 20 dental technicians and 18 dental hygienists per 100 000 in 2019 (Figure 6.5).

Dental nurses

Dental nurses or dental surgery assistants usually closely work with dentists as chair-side assistants providing support in all aspects of oral health care such as fillings, oral surgery, etc. The main tasks of dental nurses include infection prevention and control, chair-side assistance, preparation and maintenance of the dental surgery and patient care (Dublin, 2021). They are registered dental professionals who provide clinical and other support to dentists and patients. In 14 European countries the profession of dental nurse/dental assistant is regulated (European Commission, 2021c). Training of dental nurses usually takes up to two years but may also take place in the form of a three-year in-service training such as in Germany.

FIGURE 6.5 Dental hygienists, dental nurses and dental technicians per 100 000 population in European countries, 2019



Source: CECCO database, 2022.

Notes: Data for dental hygienists are estimates for Finland; data for dental nurses are estimates for Austria, Belgium, Finland, France, Ireland, the Netherlands, Romania and Slovakia; data for dental technicians are estimates for Austria, Bulgaria, Finland, Lithuania, the Netherlands and Spain.

Dental therapists

Dental therapists are registered dental professionals who carry out certain items of dental treatment direct to patients or under referral from a dentist (dental therapists usually receive a treatment plan for each patient from a dentist) (European Commission, 2021b). Dental therapists are mainly to be found in the UK and the Netherlands, where they have the largest scope of practice (see Box 6.1). In the UK dental nurses with a two-year training may enter a 27-month programme in dental therapy/dental hygiene to obtain a diploma and register with the General Dental Council (GDC). However, the majority of dental therapists and dental hygienists receive training in a three-year Bachelor programme in dental therapy and hygiene. In the Netherlands dental therapists take a four-year Bachelor university course.

BOX 6.1 Scope of practice of registered dental therapists in the UK

In the UK dental therapists can carry out various procedures direct to patients or after referral from a dentist. They can carry out a clinical examination, diagnose and plan the treatment and delivery of care within their competence. Dental therapists also provide preventive oral care to patients (including oral cancer screening) and liaise with dentists over the treatment of caries, periodontal diseases and tooth wear. They may complete periodontal examination and charting and use indices to screen and monitor periodontal diseases. The following tasks can also be performed by dental therapists:

- prescribe radiographs, take intra and extra-oral photographs
- undertake supragingival and subgingival scaling and root surface debridement using manual and powered instruments
- use appropriate anti-microbial therapy to manage plaque-related diseases
- adjust restored surfaces in relation to periodontal treatment
- apply topical treatments and fissure sealants
- place temporary dressings and re-cement crowns with temporary cement
- place rubber dam, take impressions
- care of implants and treatment of peri-implant tissues
- carry out direct restorations on primary and secondary teeth
- carry out pulpotomies on primary teeth
- extract primary teeth, place pre-formed crowns on primary teeth

Source: Scope of Practice General Dental Council, 2013.

Dental hygienists

The scope of practice of dental hygienists varies largely across European countries as the International Standard Classification of Occupations (ISCO) does not classify dental hygienists as a unique group but includes them within the sub-group “3251 – Dental assistants and therapists”. Generally, dental hygienists are confined to educational and promotional activities relating to preventive oral health as well as examination, diagnosis and provision of preventive dental care (Jongbloed-Zoet et al., 2020), which includes oral

hygiene, scale and polish, and removal of subgingival calculus. In some countries such as in Denmark, Ireland and the Netherlands, they also can place a temporary filling if requested by the dentist, and in Denmark they can place a filling. In Denmark and the Netherlands dental hygienists can also carry out an assessment and make a treatment plan. In the Netherlands they are also allowed to carry out scaling and root planning, to place fissure sealants, take radiographs, give anaesthetic and take alginate impressions (Maynard, 2010). In the Netherlands dental hygienists can be visited directly or upon referral from a dentist. In total nine out of 10 dentists refer to dental hygienists regularly (Kroneman et al., 2016).

Generally, dental hygienists work as part of a team within dental practices or work independently. Given these varying working environments, dental hygienists have an important role in inter-professional collaboration and teamwork. Nearly all 32 countries of the EU and the European Economic Area investigated by Eaton & Harris (2019) have dental hygiene schools except for Austria, Bulgaria, Cyprus, France, Greece and Luxembourg. Training varies across countries from two to four years with very different curricula (Eaton & Harris, 2019; Jongbloed-Zoet et al., 2020).

Dental technicians

Dental technicians usually produce dental devices such as dentures, crowns, bridges and orthodontic appliances (dental braces) as prescribed by a dental practitioner or clinical dental technician. They also repair dentures or dental braces. Dentists usually communicate with them with prescriptions, drawings and measurements taken from the patient (European Commission, 2021a; Mertz et al., 2021).

In Denmark, Finland, Ireland, the Netherlands and the UK some dental technicians undergo further training which enables them to become clinical dental technicians (denturists) and provide the clinical as well as the laboratory tasks required to make and fit removable dentures and mouthguards in patients' mouths (see also Box 6.2).

BOX 6.2 The variety of oral health professionals: the example of Ireland

In Ireland there is a strong tradition of dentists being well supported by dental nurses in the surgery. Dental hygienists require further training and once completed can carry out preventive treatments, dental cleaning and administer local anaesthesia. However, they cannot treat patients without the patient being first examined by a dentist. They cannot establish themselves as effective “sole traders”, and thus the oral health care system remains very dentist-centric. The only auxiliary health professional in Ireland to whom a patient can have direct access is a clinical dental technician.

Provision of dental care

Summary

- Although oral diseases are almost entirely preventable, preventive strategies in dentistry are still underutilized across the EU.
- In nearly all European countries dental care and health care professionals operate in separate domains with different education, policies, culture and traditions.
- This lack of integration or focus on prevention may hamper the effective combating of risk factors for oral diseases such as diet, smoking and use of alcohol, which are shared with other noncommunicable diseases (NCDs).
- Fluoridation of drinking water has been abandoned by most European countries, but salt and toothpaste fluoridation are important strategies to prevent caries in the whole population.
- There is large variation in the number of dentist consultations which is partly explained by data collection methods. The frequency of dental examinations reflects the design of coverage of dental services but is also determined by the density of dentists and the number of publicly funded dentists, as well as by patients' attitudes towards oral health.
- Dental care, whether it is covered by insurance or not, is mostly provided in private dental practices in Europe. On average, about

four out of five dentists work in private practices. There is an important trend of further privatization of dental care driven by corporate dentistry.

- With dental care costs varying widely between European countries, it increasingly gives rise to cross-border dental care, mainly between Western and Central Europe and amongst bordering countries.
- In recent years the composition of the oral health workforce has also changed, and the focus has changed towards strengthening the integration of oral care into other care areas.

7.1 Dental public health

As previously mentioned, oral health is often a neglected field both in health services research and in health policy. This section describes recent developments in advocacy to bring oral health onto the political agenda. It then focuses on the provision of dental public health in Europe, describing the landscape of various community-based public dental care programmes and population-based preventive strategies. It concludes with a description of utilization of dental care and recent trends of new models of care, the roles of private and public providers, including corporate dentistry, and cross-border dental care.

First, however, a common understanding of the term “dental public health” is necessary. The most cited definition comes from the American Board of Dental Public Health, which defines dental public health as *“the science and art of preventing and controlling dental diseases and promoting dental health through organized community efforts. [...] It is concerned with the dental education of the public, with applied dental research, and with the administration of group dental care programs as well as the prevention and control of dental diseases on a community basis.”* (American Dental Association, 2018).

The rising awareness of oral health and the role of prevention and integration

Recent initiatives such as the Lancet series on oral health and the Manifesto “Why Oral Health Matters” by the Platform for Better Oral Health in Europe in 2019 have aimed to raise awareness of the impact of oral health on general health and the central role of oral health for public health. In the Lancet series experts highlighted the importance of preventive policies to tackle underlying causes of oral diseases and of moving away from a treatment and technology dominated oral health system (Watt et al., 2019). The Lancet Commission on Oral Health was launched in 2020 to address the policy neglect and system failure of oral diseases. Furthermore the Commission sought to inform governments and other stakeholders with evidence-based analyses and policy recommendations to accelerate the transformation of current oral health care systems (Benzian et al., 2021).

The Oral Health resolution adopted by the WHO in May 2021 marks an important step for the recognition of the large and unequal global burden of preventable oral diseases. It follows on from a previous resolution on oral health published in 2007, which established the integration of oral health care into primary care and the reliance on a collaborative care approach on its agenda. The basis of this integrated approach was that key risk factors of oral diseases such as diet, smoking and use of alcohol are shared with other noncommunicable diseases (NCDs) which often cluster within the same individual. Similar to the Lancet series of 2019, the 2021 WHO resolution asserts that dentist-centred oral health care models and technology-driven interventions fail to sufficiently encourage prevention and that current systems fail to reduce the burden and inequalities of oral disease (WHO, 2021a; Sheiham & Watt, 2000). In the 2021 WHO resolution, the WHO Member States agreed that oral health is an integral part of general health. Furthermore, it was emphasized that oral health should be firmly embedded within the NCD agenda, given the strong association of oral diseases with other noncommunicable conditions such as cardiovascular diseases, diabetes, cancers, pneumonia, obesity and premature birth (see Section 2.1).

The Resolution urges Member States to address shared risk factors (e.g. hygiene, diet, tobacco use, alcohol consumption, stress and trauma) and to integrate strategies on oral health promotion, prevention and treatment into other NCD policies and adopting a life-course approach in addressing common risk factors. The latter includes promotion of oral health within the

family, schools and workplaces, but also food, tobacco and alcohol policy as well as timely, comprehensive and inclusive care within the primary health care system. Moreover, the WHO resolution stresses the importance of the health workforce in this context and urges Member States to enhance the capacities of oral health professionals.

In Europe the potential of preventive strategies in dentistry to improve oral health and contain costs is still underutilized. A qualitative study in five European countries identified major barriers for oral health prevention reported by dental practitioners and regulators, including the lack of effective monitoring of preventive oral health interventions. This, in turn, leads to lack of regulatory mechanisms, namely professional standards and payment and remuneration systems that incentivize preventive oral health treatments or advice. Other reasons relate to lack of knowledge and motivation as dental care training is strongly treatment-focused, as well as the unclear allocation of preventive care tasks among oral health professionals (Leggett et al., 2021).

Indeed, in nearly all European countries, dental care services are provided mostly outside the health care systems. Dental care and health care professionals operate in separate domains with different education, policies, culture and traditions. Health and care professionals have inadequate training in oral health and thus have limited oral health knowledge. As a result, oral health receives little attention in non-dental care settings. This can be especially problematic for dependent or frail people who are not able to assess their need for dental care and/or cannot seek dental care themselves, such as elderly people in home and residential care or people with chronic conditions and multimorbidity. Often dental care is provided ad-hoc based upon need and dentists work separately from the (primary) care team. Thus, there is a need to better integrate oral health care into primary care and to provide more flexible, inter-professional education to building the competence and confidence of health professionals to offer appropriate oral health care. At the same time, oral health care professionals also need a better understanding of inter-relationships between oral diseases and multiple other health conditions and ways to address the needs of people with (multiple) chronic conditions. Skills for collaborative care that allow dentists to be part of multi-disciplinary teams must be integrated in undergraduate, graduate and continuing professional development training (Watt & Serban, 2020). Reforming the curricula of dental, medical care and non-medical care training is therefore important to provide graduates with the necessary skills such as teamwork and shared care to function in an integrated health system

(Mays, 2021), to ultimately overcome the siloed approach of professional education (Watt & Serban, 2020) (see also Section 7.6).

In many European countries there is growing recognition of the association of common risk factors, and of the need both to strengthen preventive dental care and to promote the integration of dental care. With the rising prevalence of chronic diseases and multimorbidity, countries have started to search for and develop ways in which oral health needs can be better integrated into general health, notably for people with chronic conditions and the elderly. For example, Sweden is currently looking into opportunities to better integrate oral health into primary care, especially for patients with chronic conditions and multimorbidity. It explores opportunities to develop collaborations locally for preventive care by including dentistry. Germany has introduced a framework for cooperation contracts between private dentists and nursing homes in 2014 with the aim of improving the oral health of people in residential care facilities.

Community oral health programmes

A central component of oral health care systems is preventive community programmes for children and other vulnerable population groups. Such programmes benefit populations including children, the elderly and pregnant women, and have consistently been proven effective in “improving the knowledge, attitude and practice regarding oral health” (Nakre & Harikiran, 2013). Oral health promotion and prevention programmes have also improved the overall oral health status of populations in high-income countries, especially among children (WHO, 2013). Primary oral health prevention initiatives performed by oral health professionals include fluoride varnish application, placing fissure sealants, prescribing high-fluoride content toothpaste, providing oral hygiene advice and instruction, and providing dietary advice. Oral health promotion includes education on oral health prevention measures (diet, hygiene) through community-based programmes but also other interventions (i.e. legal, fiscal, economic, environmental) aimed at facilitating the achievement of oral health and the prevention of disease (Leggett et al., 2021; Strippel, 2008).

The 2015 report of the Platform for Better Oral Health in Europe assembled a number of population-based preventive initiatives illustrating the programmes for prevention of oral diseases and promotion of good oral health

that exist in Europe (Platform for Better Oral Health in Europe, 2015). Prevention programmes in schools for all children have become common across Europe, ranging from prevention campaigns for pre-schoolers in Belgium and oral health care education in classrooms in Denmark to oral health education in kindergartens and elementary schools in Czechia. While there is a long tradition of Scandinavian countries providing comprehensive school oral health services (Jürgensen & Petersen, 2013), many Eastern European countries also had similar services in the 1990s (except Slovenia). In the case of Southern Europe, countries such as Spain included legislative amendments to guarantee the promotion of health, including oral health, from the 1990s onwards (Dirección General de Salud Pública, 2005), to be carried out by regions and municipalities, such as the PADI programme, with very different regional impacts (Box 7.1) (Dirección General de Salud Pública y Participación, 2005), whilst Italy and Portugal have also introduced educational programmes in schools. In Italy this entailed the use of positive oral health messaging in multimedia content and games (Vozza et al., 2014), and in Portugal via supervised daily teeth brushing and oral health awareness campaigns (Platform for Better Oral Health in Europe, 2015). In turn, in Western Europe programmes such as “Apollonia 2020” in Austria and “Hou je mond gezond!” (“Keep your mouth healthy”) in the Netherlands aim to introduce annual or periodic class visits to a dental clinic in order to improve awareness and knowledge of good dental care practices (Buunk-Werkhoven, Takrovskaja & Steverink-Jorna, 2018; Platform for Better Oral Health in Europe, 2015). Initiatives such as the European Network of Health Promoting Schools have attempted to universalize these programmes across Europe and lay out a set of guidelines for preventive and awareness programmes in educational settings to follow (European Commission, 1996).

BOX 7.1 The PADI programme reduced the burden of dental diseases in childhood in the Basque Country and Navarre

The Children Dental Care Programme (Programa de Atención Dental Infantil, PADI) was established in 1990. Four factors motivated the introduction of the programme: (1) a general health survey discovered and raised general concern about dental health problems in the target population, (2) the existing public dental services suffered from inadequate scope and quality, (3) dental public health policy was at the time non-existent, and (4) the available evidence for early and effective population-based (preventive) interventions to improve child dental health status. PADI was designed with two main objectives: to reduce by 50% both the DMFT index and the prevalence of caries in Basque children over a ten-year period.

In the light of economic constraints and feasibility, an incremental implementation of the programme initially secured entitlement to PADI for all children reaching the age of 7 in 1990, expanding the programme annually with a new cohort of 7 year olds. The PADI care package is characterized as follows:

- Free access to periodic compulsory check-ups, fissure sealants, fillings, endodontics and all other treatment necessary for teeth maintenance.
- Payment for child dental care is made via annual capitation vouchers and no user fees apply.
- Each individual child sees a personal dentist, and there is a free choice of provider from dentists employed by the Basque NHS or private dentists with Community Dental Service accreditation.
- Certain procedures, predominantly those in response to incisors fracture, are provided on a fee-for-service basis and subject to authorization.
- The package excludes treatment of orthodontics and temporary dentition.
- A School Dental Survey evaluates the programme every 10 years.

In 2018 the fourth School Dental Survey indicated that 75% of children aged 12–14 years were caries-free (DMF=0) compared to merely 18% in 1988. Currently, 69% of the eligible children use PADI.

Sources: Farfán Barrios, 2012; Freire, 2003; Simón Salazar & Aguirre Urizar, 2015.

Educational interventions have not been limited to schools. An important branch of oral health prevention education includes programmes targeting pregnant women or recent mothers, which have also been shown to be effective in preventing tooth decay and promoting good oral care practices (George et al., 2019; Rigo, Dalazen & Garbin, 2016). In Europe Portugal has been developing formative programmes to prevent early childhood caries, involving educational conferences and brochures distributed to mothers both pre- and post-partum (Platform for Better Oral Health in Europe, 2015). Similarly, countries such as Belgium and the United Kingdom have also engaged in these practices (Abou El Fadl, Blair & Hassounah, 2016). The Childsmile programme targeting the oral health of children but also young parents in Scotland since 2006 aims to improve children's oral health and reduce inequalities both in oral health and in access to oral health care. In 2019 the programme, which is run by the Scottish government, has been identified as a best practice example by the European Commission (Box 7.2). The Netherlands has designed programmes involving educational play events with parents and children (Buunk-Werkhoven, Takrovskaja & Steverink-Jorna, 2018), and several municipalities in Spain have designed programmes targeting not only recent mothers and pregnant women but also parents of children up to 6 years old (Farfán Barrios, 2012). Italy, on the other hand, implemented programmes based on surveys for parents to evaluate and reinforce their oral care awareness and knowledge (Calcagnile et al., 2019).

BOX 7.2 The Childsmile programme in Scotland

Childsmile is a preventive multicomponent programme available to all children in Scotland. It delivers both universal interventions to all children and targeted interventions focused on socioeconomically deprived children predicted to be at higher risk of dental caries. It covers four main interventions: (1) dental health support worker home and community contacts, (2) daily supervised tooth brushing at nursery schools and kindergartens, (3) nursery fluoride varnish applications (targeted at children from the age of 3 years from the more deprived communities, applied twice per year by extended duty dental nurses and (4) early visits to primary care dental practices. Childsmile has largely contributed to reduce caries prevalence in Scottish children. Between 2005 and 2017 the share of children without obvious decay experience in permanent teeth increased from 53% to 77% (Kidd et al., 2020; NHS Scotland Information Services Division, 2012).

Fluoridation plays an important role in dental caries prevention

The use of different modes of fluoride to prevent dental caries is a common dental public health measure. Fluoridated toothpaste and fluoridated salt are used to increase the level of fluoride intake and thus reduce the likelihood of experiencing dental decay without requiring individuals to change behaviour (Mullen, 2005; Peterson & Lennon, 2004). Fluoridated toothpaste is currently the most commonly used approach to ensure sufficient intake of fluoride for dental decay prevention (Árnadóttir et al., 2004), although the market shares vary across countries.

Community water fluoridation (CWF) is another safe and effective way to increase the intake of fluoride in the general community. A number of studies report on the general and dental benefits of CWF for populations. It has been shown to reduce the prevalence of caries by 15% (McDonagh et al., 2000) and is especially beneficial for the cessation of children's dental caries (Locker, 1999). Numerous organizations and studies highlight the cost-effectiveness, safety and equity of caries prevention at community level through water fluoridation (Ajiboye, Dawson & Fox, 2018; CDC, 2018; Cronin et al., 2021; FDI World Dental Federation, 2014). However, systematic exposure to fluoride increases the risk of dental and enamel fluorosis (a defect of the enamel ranging from mild speckling to more gross effects) (Medical Research Council, 2002; Mullen, 2005; Scientific Committee on Health and Environmental Risks (SCHER), 2010). Generally, water fluoridation is considered necessary where there is a significant disease risk and where other types of fluoridation are not available. The WHO is supporting water fluoridation where it is technically feasible, but also highlights that fluoridation of salt and milk fluoridation schemes are valid alternatives (Mullen, 2005; WHO, 2019).

In Europe most countries do not add fluoride to drinking water. Ireland and some regions in Spain and the UK are the only countries and regions enforcing a policy of mandatory water fluoridation and add fluoride to drinking water (at levels from 0.2 to 1.2mg/L) (Scientific Committee on Health and Environmental Risks (SCHER), 2010). In Ireland nearly three quarters of the population have access to fluoridated water. Most European countries have not implemented water fluoridation due to other methods of fluoridation (Mullen, 2005).

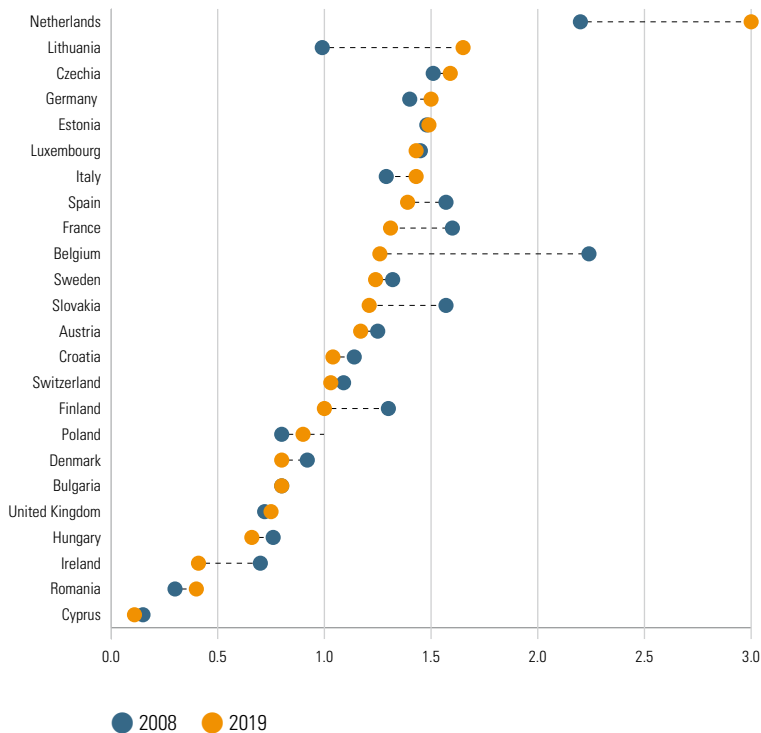
7.2 Utilization of oral health services

Across the 24 European countries for which data were available patients visited a dentist for preventive and/or curative services (see Table 4.2, Section 4.3) on average 1.1 times per year in 2019 (in all settings) (Figure 7.1), with an almost four-fold variation across countries ranging from 0.1 visits in Cyprus to 3.0 visits in the Netherlands. These data need to be interpreted with caution as the large spread may be partially explained by different data collection methods across countries. For example, the number of dentist consultations in the Netherlands is based on the Health Interview Survey, while in Hungary and Denmark the data contain only cases that are registered by the national health insurance schemes, i.e. not including privately paid visits. In Poland the numbers of dental visits are provided by dentists (OECD, 2019a). The different reporting mechanisms lead to over- and underestimations. It is important to highlight that frequency of dental visits should be determined by oral health needs. Attending too frequently when needs are low is not advisable as this encourages overtreatment, and therefore a high number of visits per year may not necessarily be a good thing.

Looking at the trend over time, the largest decrease can be observed in Belgium. In 2008 an adult consulted a dentist on average more than twice a year, but the average number of consultations decreased to 1.26 times in 2019. A study by a Belgian voluntary health insurance shows that between 2015 and 2017 half of the elderly population (70 years and above) visited a dentist regularly, but one in three people above 70 years did not visit a dentist at all, with most of them being dependant persons (Kestens, Brabant & Peeters, 2019). Among the population aged 25–64 years, nearly one in four persons did not visit a dentist in that period (Collège intermutualiste national (CIN), 2018). In the same period the average number of dental consultations increased most strongly in the Netherlands, although the country has among the lowest dentist per capita ratios (see also Section 6.1). This discrepancy may be related to the important role of dental hygienists who provide services to patients without the need for referral from a dentist. In the Netherlands dental hygienists are allowed to place a temporary filling when requested by a dentist, to carry out scaling and root planning, to place fissure sealants, take radiographs, give anaesthetic and take alginate impressions (Maynard, 2010) (see Section 6.3).

As seen in Section 5.3, within European countries dental attendance varies with the socioeconomic status of the population, with problems being most persistent among disadvantaged and low-income groups. This is reflected in the probability of dentist visits by income quintile (Figure 5.8). By contrast, the different utilization rates of oral health services across countries also reflect the design of oral health systems, i.e. coverage of dental services, OOP payment, access to dental care in terms of waiting times and distance determined by the density of dentists as well as the number of dentists with a contract with the health insurance. However, also attitudes, subjective norms, self-efficacy, perceived control and past dental attendance influence the use of dental services (Luzzi & Spencer, 2008; Manski & Moeller, 2017).

FIGURE 7.1 Dentist consultations per person per year (in all settings), 2008 and 2019



Source: Eurostat, 2021.

Notes: First year data for Spain and Sweden refer to 2009, for Czechia and Ireland to 2010, for Switzerland to 2012, and for Italy and Bulgaria to 2014. Latest year data for Spain and Switzerland refer to 2017.

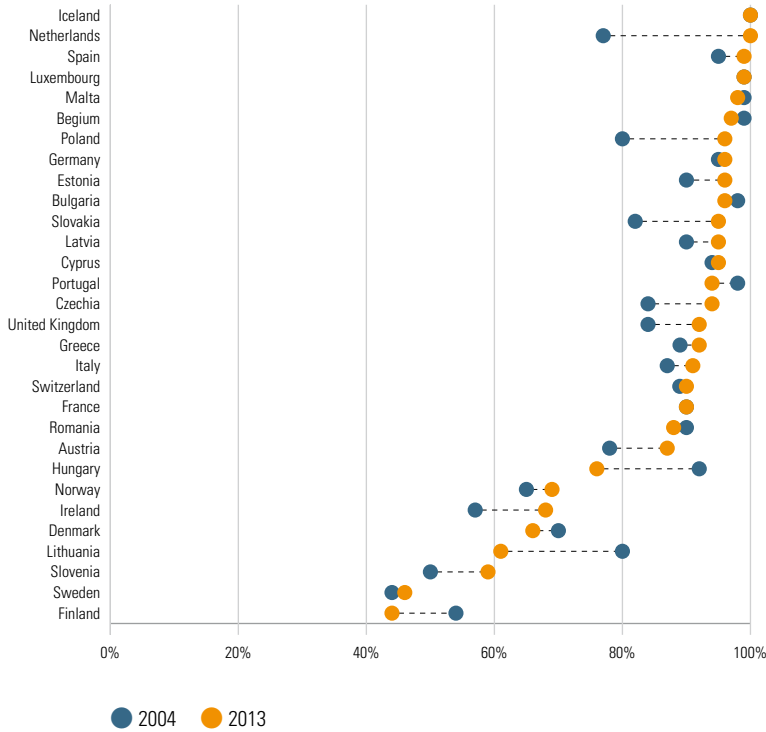
7.3 Public and private provision

In almost all European countries dental care is predominantly provided by dentists working in independent (“private”) practices that provide dental care that is both publicly and privately covered. In 22 of the 30 countries included in a survey on dental care practices in Europe more than 80% of dentists practise in a privately owned practice (see Figure 7.2). However, most countries have in place some kind of publicly funded oral health care delivered by salaried dentists directly employed by the state, though to a very different extent. In the Nordic and Baltic countries provision outside private practices often includes statutory oral health care, preventive services and emergency care (Kravitz, Bullock & Cowpe, 2015). Public provision is the most pronounced in Sweden and Finland, where only 46% and 44% of dentists respectively work in private practices. The majority of dentists work in public dental clinics or municipal health centres that have a focus on dental care provision for children and adolescents. In Norway statutory dental care is provided by salaried dentists in dental care clinics operated by the counties. The private sector generally treats adults, many of whom receive co-payment from the state. Also in Portugal, where traditionally dentists operate in private practices, a pilot project for the integration of dentists in 13 NHS primary care units started in 2016 in the regions of Alentejo and Lisbon and the Tagus Valley, with the aim of improving access especially for the most vulnerable patients. Since then, the project has expanded to further primary care units (see Section 4.4) (SNS, 2016).

The provision of oral health services has undergone important changes in Europe, especially in new EU Member States, since the mid-1990s. Prior to 1989/1990 dental care in new EU Member States was largely a public service provided free of charge in state-owned clinics and nearly all dentists were salaried employees of the state (Oancea et al., 2016; Widström et al., 2001). After the dissolution of the former Soviet Union, dentistry was among the public services which experienced rapid privatization and today only a minority of dentists are public servants. As depicted in Figure 7.2, between 2004 and 2013 the share of dentists working in private practices increased in nearly all countries. The largest increase could be observed in Poland (20 percentage points) and Slovenia (18 percentage points). Consequently, the ownership of dental practices no longer differs between Eastern and Western European countries.

However, in 2021 publicly funded oral health clinics still play an important role in the provision of oral health services and in preventive services in new EU member countries (e.g. school education programmes, fluoridation programmes). In Poland 1170 public dental clinics provide free dental care to children (Malkiewicz et al., 2016). However, the number of dental care providers contracted by the National Health Fund (NFZ) to provide statutory dental care has decreased by about 22% between 2010 and 2017 (Sowada et al., 2019). Also in Slovenia oral health care is available in primary health care centres. However, more than 40% of active dentists are private providers working under contract with the National Health Insurance (HIIS) and an increasing share, approximately 15% of all active dentists, do not work under a contract with the HIIS (Albrecht et al., 2021). In Romania only about 20% of all 14 282 dentists in 2013 were registered in the public sector and were providing services for the NHIH (Oancea et al., 2016). The decreasing share of practices that have a contract with national health insurances has an important impact on access to dental care. As public oral health services are limited, subsequent increased waiting times and distances to contracted dentists are proving major access barriers in many countries (e.g. Estonia and Lithuania), especially in rural areas or less wealthy regions with a lower density of dentists. Hence the share of dentists contracted by statutory health insurance may be an important challenge to equal access to oral health services (Winkelmann et al., 2022).

FIGURE 7.2 Share of dentists working in private practice, 2004 and 2013 (or nearest available)



Source: Kravitz, Bullock & Cowpe, 2015; Kravitz & Treasure, 2004.

Notes: years of measurement vary across countries. For the 2004 series the following years of measurement were used: 2005 for Bulgaria; 2008 for Bulgaria and Lithuania. For the 2013 series the following years of measurement were used: 2010 for Sweden; 2011 for Italy and Belgium; 2012 for Iceland, Portugal, Latvia, Germany, France and Czechia; and 2013 for all remaining countries.

7.4 Corporate dentistry

The growth of corporate dentistry marks an important development in the provision of oral health services in Europe. The overall lack of market regulation in dentistry has created economic opportunities for for-profit investment in dentistry by companies owned by individual entrepreneurs and private equity investors, in particular in the Nordic countries, Switzerland, the UK, Germany, Belgium, France, Italy and Spain (Council of European Dentists (CED), 2018; Pälvärinne et al., 2018). The companies offer administrative support along with business management expertise, and may

operate in one country or across different countries. They ensure financial stability, offer advantages of investment in technology such as computer-aided design and computer-aided manufacturing (CAD/CAM) and 3D printing and allow for increasing specializations (Council of European Dentists (CED), 2018).

Today, a large network of corporate dentistry exists across Europe, driven by an increasing interest in the return of investment in these organizations (Council of European Dentists (CED), 2018; GFDDI/VDDI, 2018). However, there are major differences between the models of corporate dentistry. In Sweden the “Praktikertjänst” became the largest private dental health care provider in 2012 with 1170 employees (dentists and dental assistants) (Dominique, Ouardirhi & Kelly, 2018; Praktikertjänst, 2021). This business model offers access to investment opportunities for individual dental entrepreneurs who can become managers capable of buying shares of the dental clinics they help to create and develop. The bargaining power and central organization of processes reduces clinic running costs while securing a standard of quality. Overall, the risk is reduced for dental entrepreneurs who may benefit from a secure salary, as well as from the brand power of the organization.

Overall, in most European countries the share of corporate dentistry is still relatively small but growing, with dental chains acquiring individual practices and smaller group practices. The largest market of dental groups exists in Finland with a market share of 35% in 2015. In Spain and the UK dental chains account for about one quarter of practices (in terms of the numbers of dentists). The UK has the largest dental chain, “my dentist”, which comprises over 600 practices (GFDDI/VDDI, 2018; my dentists, 2021). In the Netherlands, Denmark and Italy corporate practice has a considerably smaller market share (10%, 7% and 3% respectively) (Council of European Dentists (CED), 2018; GFDDI/VDDI, 2018). In most European countries an increasingly competitive market is forcing the merger of many regional practices to reduce costs and remain profitable. The Council of European Dentists (CED) has expressed concerns about this development, in terms of quality of care, patient safety and employment conditions. Critics fear monopolization and further commercialization of dental services with negative consequences for patients’ choice and access, as well as for the continuity of dental care (Council of European Dentists (CED), 2018).

7.5 Cross-border dental care

With dental care costs varying widely between countries across Europe, it increasingly gives rise to the development of “dental tourism”. The phenomenon of cross-border dental care is part of the flourishing industry of health tourism in Europe (Zoltan & Maggi, 2015), and is most pronounced between Western and Central Europe and amongst bordering countries such as Austria and Hungary (Struckmann et al., 2017; Winkelmann et al., 2013), with Budapest considered Europe’s dental tourism capital (Booth, 2019). Several Eastern and South-Eastern European countries, particularly Romania and Croatia, currently envision dental tourism as a promising industry, promoting its rapid development with the additional prospects of increased tourism and foreign investment (Oltean et al., 2020). Varying statutory coverage for dental care also gives rise to cross-border care. In Switzerland, where dental treatments must be paid privately or can be covered by private insurance, about one out of five patients travelled abroad to receive dental care in 2010 (Gheorghe, Zürcher & Filippi, 2017).

The appeal of dental care tourism in Europe resides not only in the stark price differences between countries, but also in the European Union’s cross-border care framework which greatly expanded the possibilities to receive public reimbursement for health services and treatments provided in other Member States or EEA countries. For example, in countries such as France and Germany, where a wide range of services are covered in the benefits basket at a fixed maximum reimbursement, access to treatment at much lower prices abroad makes it possible for many patients to receive dental care without cost-sharing (Zahnklinik Ungarn, 2020).

Countries in Eastern and South-Eastern Europe in particular have experienced growing numbers of patients from abroad due to significant price differences. Dental clinics in border regions have a strong incentive to offer more extensive prosthetic rehabilitations to individuals living in neighbouring countries or countries with higher prices. Such individuals may end up purchasing health-tourism packages sometimes via agencies at home. As a result, not only are private clinics in Hungary and Poland treating their wealthier neighbours at their own health care facilities, but a significant number of dental professionals move to Germany, Sweden or Norway to offer services at lower costs. The number of European dentists employed in the private sector in Norway has nearly tripled between 2003 and 2019, with Poland being the principal country of origin (Statistics

Norway, 2020). In Sweden the emergence of low-cost dental practices staffed with dentists mainly from Eastern European countries has been a trend since 2005. Dentists in these practices usually provide services for a period of three months, which is the legal time limit in practice to avoid being taxed on the provisions obtained. However, these practices have important repercussions for patients as they may face lower quality of the oral care provided, may experience difficulty understanding the dentist/patient exchange, and a less continuous care experience due to the permanent turnover of staff (Dominique, Ouadirhi, & Kelly, 2018).

The opportunities provided by the cross-border care framework do not benefit all EU citizens. Indeed, patients from countries with lower dental care reimbursements from the public payer have a disadvantage in accessing health care abroad, which increases health inequalities across the EU (European Public Health Alliance (EPHA), 2015). Patients from countries with lower reimbursement for dental care must cover the difference in the cost in treatment out of their own pocket, whilst patients from Member States with broader coverage have to cover far less for dental services in lower-cost settings. Although several initiatives, including the EU's evolving cross-border care framework, aim to achieve a higher level of cohesion and harmonization in medical treatment across the European Union, responsibility for health care systems remains within the competences and autonomy of Member States (European Parliament, 2021).

7.6 Trends in dental care provision

As with ambulatory health care, oral health care provision has undergone important changes with regard to models of care, collaboration of professionals and new professional roles in many European countries in recent years. Traditionally, dental care in the private sector is provided by small practices owned and run by one or a few dentist(s). Over the course of the last decade in many countries dentists increasingly formed larger group practices to meet the higher investment costs for expensive equipment but also to share responsibilities and concentrate on different types of care. The UK is a front-runner with respect to group practices, with on average four dentists working in each practice. Individual practices (run by one single dentist) virtually do not exist any more in the UK (GFDI/VDDI, 2018). In the Netherlands the size of practices has increased between 1995 and

2018, while the number of individual practices decreased (Den Boer, Van Der Sanden & Bruers, 2020). More than one third of dental practices (40%) in the Netherlands are run by group practices with two or three dentists (Kravitz, Bullock & Cowpe, 2015). It can be expected that the number of group practices will continue to grow in the coming years while the share of traditional individual practices will decline. Dental care within hospitals is available in most countries, but whether these services fall under dental or medical practice varies considerably across EU Member States (Kravitz, Bullock & Cowpe, 2015).

In recent years the composition of the oral health workforce has also changed (Holmes, Burford & Vance, 2020). The role of dental hygienists and prevention assistants in European countries has become more important, mainly due to the general shift towards preventive care and the reduced need for curative treatment (Den Boer, Van Der Sanden & Bruers, 2020; Luciak-Donsberger, 2003). The profession of dental hygienists in Europe has been inspired by delivery of preventive dental care in the US (Luciak-Donsberger, 2003). Dental hygienists provide preventive dental care and oral health promotion, which may include removing calculus and plaque, counselling patients about good nutrition and its impact on oral health, and teaching patients appropriate oral hygiene strategies to maintain oral health. Dental hygienists are also responsible for diagnosing and taking part in the treatment of dental caries and periodontal diseases and thus closely collaborate with dentists (see Section 6.3) (Johannsen et al., 2019). While cross-country data on dental hygienists collected by international organizations are lacking, a study from 2010 (Widström, Eaton & Luciak-Donsberger, 2010) shows that between 1998 and 2007 the total number of dental hygienists in 30 EU Member States and Switzerland has increased by 42% while the number of dentists increased only by 13% in the same period. As a result, the changing trends have influenced possibilities of task-sharing between dentists and dental hygienists. A recent British study identified a multiprofessional dental workforce with a considerable expansion of dental nurses and dental therapists in the north-east of England and north Cumbria. However, the opportunities to develop the skills of dental therapists were found not to be fully deployed (Holmes, Burford & Vance, 2020).

The WHO resolution on oral health (2021) (WHO, 2021a) has recommended that health system capacities should be strengthened by

reorienting the oral health workforce to a team approach that includes community and mid-level health providers. Specific policies to address this demand require a holistic approach that includes more flexible allocation of responsibilities as well as delegation of tasks to non-dental practitioners. This becomes even more important in light of the rising numbers of older people who retain their teeth for longer but have multiple co-morbidities and complex oral health needs (Dibello et al., 2021; Schwendicke et al., 2019). Thus there is a need to better integrate oral health care for all population groups, and in particular for older people who often face a number of barriers to adequate oral care and oral hygiene (Manski & Moeller, 2017). A more flexible workforce that is able to offer appropriate (preventive) oral health care and oral hygiene outside traditional dental care settings (e.g. in residential care facilities, schools, child care settings, primary care settings, etc.) would not only enhance access for patients but also improve efficiency of delivery and cost-effectiveness of care (Holmes, Burford & Vance, 2020) (see Section 7.1).

Conclusions

Oral diseases are increasingly recognized as one of the most prevalent conditions in Europe, affecting nearly half of the European population. However, many European citizens lack coverage or face difficulties in accessing the oral care they need. While most countries provide extended coverage for vulnerable population groups such as children and the elderly, dental care coverage for the adult population is generally less comprehensive. Large differences persist across the European Union and great scope remains to improve the situation.

Furthermore, the most common oral diseases, which include tooth decay, gum disease, tooth loss and oral cancers, are largely preventable, a potential which is currently not fully exploited. This leads to many inefficiencies because treatment of these oral diseases requires expensive invasive and technology-based methods. This can partly be explained by the payment systems currently in use in oral health systems, which still incentivize restorative dental care and use of technology. Consequently, effective prevention strategies that seek to reduce risk factors (e.g. oral hygiene, dietary behaviour, etc.) and maintain natural teeth for as long as possible are still not widely prioritized and deployed. Such prevention and promotion services should not only be provided by oral health professionals but also by health and care workers in other health care sectors.

However, a broad and effective oral health promotion policy that spans various care settings and areas of life is not yet sufficiently implemented. To better inform policy-making on the underlying causes and the prevalence of oral disease, as well as the effectiveness of community preventive activities, robust and meaningful data are needed. Yet there are only very few indicators that demonstrate the impact and potential of preventive measures. Therefore, data and measures on health outcomes and costs associated with oral

health must be developed to identify best practice. This can then foster the development of oral health promotion and community preventive strategies that are integrated into national or community health programmes.

The recognition of oral diseases as a major noncommunicable disease with the WHO oral health resolution in 2021 is an important step paving the way towards more preventive oral health care. It also places a much stronger emphasis on holistic and integrated oral health care with the patient at the centre. However, currently dentistry is still provided in a silo-based approach, separated from other health care areas. This partly reflects a discipline-oriented education. Undergraduate training of dentists and other health professionals generally does not cover the relationships between oral health status and chronic health conditions, nor the underlying common risk factors. Dental as well as most medical training curricula usually do not include interdisciplinary and collaborative skills which are necessary for multidisciplinary teamwork involving oral health care and other health care professionals.

Overall, health indicators that measure oral health status have improved over time. However, more harmonized data reporting not only for health indicators but also for health system-related indicators is needed. So far, a comprehensive and systematic collection of information on provision, use, access, spending on VHI and OOP, quality and coverage of oral health services is lacking. In particular, information on the oral health workforce, dental education, provision and utilization of oral health services is missing. This type of information is necessary to assess and compare the performance of oral health systems and for the design of appropriate oral health policies and the selection of public health interventions. The current information systems only collect very few indicators on dental care, namely expenditure on outpatient dental care, unmet needs, numbers of dentists and dental visits per year. Integration of oral health indicators into existing national and international knowledge systems (Eurostat, ECHI, WHO) is essential to improve the evidence base on oral health care. Moreover, research on oral health prevention and promotion is needed to evaluate the related cost savings compared to curative dental care (Patel, 2012; WHO, 2013).

Appendices

9.1 References

- About El Fadl R, Blair M & Hassounah S (2016). Integrating Maternal and Children's Oral Health Promotion into Nursing and Midwifery Practice – A Systematic Review. *PLOS ONE*, 11(11):e0166760. Available at: <https://doi.org/10.1371/journal.pone.0166760> (accessed 8 March 2022).
- Ajiboye AS, Dawson DR & Fox CH (2018). American Association for Dental Research Policy Statement on Community Water Fluoridation. *Journal of Dental Research*, 97(12):1293–6. Available at: <https://doi.org/10.1177/0022034518797274> (accessed 8 March 2022).
- Albrecht T et al. (2021). *Slovenia: Health system review. Health Systems in Transition*, 23(1):i–188.
- Allin S et al. (2020). Do health systems cover the mouth? Comparing dental care coverage for older adults in eight jurisdictions. *Health Policy*, 124:998–1007. Available at: <https://doi.org/10.1016/j.healthpol.2020.06.015> (accessed 8 March 2022).
- Ameli (2020). Convention nationale 2018–2023: Valoriser l'activité du chirurgien-dentiste [National convention 2018–2023: Promoting the activity of the dental surgeon]. Available at: <https://www.ameli.fr/chirurgien-dentiste/textes-reference/convention/valoriser-activite-chirurgien-dentiste> (accessed 11 June 2021).
- Ameli (2021). 100% Santé dentaire: des couronnes, bridges et dentiers entièrement remboursés [100% dental health : fully reimbursed crowns, bridges and dentures]. Ameli, 4 February 2021.
- American Dental Association (2018). Specialty Definitions. Available at: <https://ncrdsch.ada.org/en/dental-specialties/specialty-definitions> (accessed 15 March 2022).
- Árnadóttir IB et al. (2004). A European perspective on fluoride use in seven countries. *Community Dentistry and Oral Epidemiology*, 32(SUPPL. 1):69–73. Available at: <https://doi.org/10.1111/j.1600-0528.2004.00142.x> (accessed 7 March 2022).
- Australian Institute of Health and Welfare (2020). *National Oral Health Plan 2015–2024: performance monitoring report*. Available at: <https://www.aihw.gov.au/reports/dental-oral-health/national-oral-health-plan-2015-2024/contents/summary> (accessed 7 March 2022).
- Azogui-Levy S & Boy-Lefèvre M-L (2017). Inégalités d'accès aux soins dentaires [Inequalities in access to dental care]. *Après-demain*, 42, NF(2):30–2. Available at: <https://doi.org/10.3917/apdem.042.0030> (accessed 7 March 2022).
- Bellander L, Andersson P, Nordvall D & Hägglin C (2021). Oral health among older adults in nursing homes: A survey in a national quality register, the Senior Alert. *Nursing Open*, 8(3):1262. Available at: <https://doi.org/10.1002/NOP2.743> (accessed 7 March 2022).

- Benzian H, Guarnizo-Herreño CC, Kearns C, Muriithi MW & Watt RG (2021). The WHO global strategy for oral health: an opportunity for bold action. *Lancet* (London, England), 398(10296):192–4. Available at: [https://doi.org/10.1016/S0140-6736\(21\)01404-5](https://doi.org/10.1016/S0140-6736(21)01404-5) (accessed 7 March 2022).
- Bernabe E et al. (2020). Global, Regional, and National Levels and Trends in Burden of Oral Conditions from 1990 to 2017: A Systematic Analysis for the Global Burden of Disease 2017 Study. *Journal of Dental Research*, 99(4). Available at: <https://doi.org/10.1177/0022034520908533> (accessed 7 March 2022).
- Bindi M, Paganelli C, Eaton KA & Widström E (2017). The healthcare system and the provision of oral healthcare in European Union Member States. Part 8: Italy. *British Dental Journal*, 222:809–17. Available at: <https://doi.org/10.1038/sj.bdj.2017.459> (accessed 7 March 2022).
- Booth J (2019). Cost-savings for dental tourists in Hungary are increasing. *Dental Tribune International*, December 2019. Available at: <https://www.dental-tribune.com/news/cost-savings-for-dental-tourists-in-hungary-are-increasing/> (accessed 30 April 2021).
- Bravo M, Martín LS, Casals E, Eaton KA & Widström E (2015). The healthcare system and the provision of oral healthcare in European Union Member States. Part 2: Spain. *British Dental Journal*, 219(11):547–51. Available at: <https://doi.org/10.1038/sj.bdj.2015.922> (accessed 7 March 2022).
- Bundesrat (2021). Verordnung des EDI vom 29. September 1995 über Leistungen in der obligatorischen Krankenpflegeversicherung [EDI ordinance of 29 September 1995 on benefits in compulsory health insurance]. Available at: https://www.fedlex.admin.ch/eli/cc/1995/4964_4964_4964/de (accessed 14 June 2021).
- Busse R & Schlette S (2007). *Health Policy Developments 7/8: focus on prevention, health and aging, and human resources*. Gütersloh: Verlag Bertelsmann Stiftung.
- Buunk-Werkhoven Y, Takrovskaja T & Steverink-Jorna L (2018). Kidsfabriek: Oral health awareness and promotion of oral self-care during a learning and play event for children and parents in The Netherlands. *Annual Clinical Journal of Dental Health*, 7:22–5.
- Caisse Nationale de Santé (CNS) (2021). Soins dentaires – Assuré – CNS – Luxembourg [Dental care – Insured – CNS – Luxembourg]. Available at: <https://cns.public.lu/fr/assure/remboursement-prise-charge/soins-dentaires.html> (accessed 14 June 2021).
- Calcagnile F, Pietrunti D, Pranno N, Giorgio GD, Ottolenghi L & Vozza I (2019). Oral health knowledge in pre-school children: A survey among parents in central Italy. *Journal of Clinical and Experimental Dentistry*, 11(5):327–60. Available at: <https://doi.org/10.4317/jced.55378> (accessed 7 March 2022).
- Calvet L, Moisy M, Chardon O, Gonzalez L & Guignon N (2013). Santé bucco-dentaire des enfants: des inégalités dès le plus jeune âge [Children's oral health: inequalities from an early age]. *Études et Résultats*, (847):1–6.
- CDC (2018). Statement on the Evidence Supporting the Safety and Effectiveness of Community Water Fluoridation. Available at: <https://www.cdc.gov/fluoridation/guidelines/cdc-statement-on-community-water-fluoridation.html> (accessed 17 December 2021).
- CDC (2020). Oral Health Conditions. Available at: <https://www.cdc.gov/oralhealth/conditions/index.html> (accessed 18 February 2022).
- CECDO (2022). CECDO Database. Available at: <https://cecd.org/oral-healthcare/cecd-database/> (accessed 7 March 2022).
- Céant N, Guillaume S & Rochereau T (2014). *Enquête sur la santé et la protection sociale 2012* [Health and Welfare Survey, 2012]. Available at: www.irdes.fr/recherche/rapports/556-enquete-sur-la-sante-et-la-protection-sociale-2012.pdf (accessed 7 March 2022).
- Charalambous C, Maniadakis N, Polyzos N, Fragoulakis V & Theodorou M (2013). The efficiency of the public dental services (PDS) in Cyprus and selected determinants. *BMC Health Services Research*, 13 (420). Available at: <https://doi.org/10.1186/1472-6963-13-420> (accessed 7 March 2022).

- Charalambous C, Theodorou M & Eaton KA (2020). The system of the provision of oral healthcare in the Republic of Cyprus and the effect of the economic crisis. *Oral Health and Preventive Dentistry*, 18(2):213–19. Available at: <https://doi.org/10.3290/j.ohpd.a43002> (accessed 7 March 2022).
- Chevreur K, Berg Brigham K, Durand-Zaleski I & Hernandez-Quevedo C (2015). France: Health System Review. *Health Systems in Transition*, 17(3):1–218, xvii.
- Choi HJ (2018). *Price Setting of Dental Services in the Norwegian Dental Market*. University of Oslo thesis, November 2018.
- Collège intermutualiste national (CIN) (2018). *1 Belge sur 4 ne se rend pas chaque année chez le dentiste* [1 in 4 Belgians do not go to the dentist every year]. Available at: <https://www.caami-hziv.fgov.be/fr/system/files/documents/Mond-en-Tandzorg-NIC-FR.pdf> (accessed 7 March 2022).
- Conway D, Petticrew M, Marlborough H, Berthiller J, Hashibe M & Macpherson L (2009). Significant oral cancer risk associated with low socioeconomic status. *Evidence-Based Dentistry*, 10(1):4–5. Available at: <https://doi.org/10.1038/sj.ebd.6400623> (accessed 7 March 2022).
- Council of European Dentists (CED) (2018). *CED Resolution: Corporate Dentistry in Europe*. Available at: from https://old.nil.org.pl/_data/assets/pdf_file/0017/134333/CED-Resolution-on-Corporate-Dentistry.pdf (accessed 7 March 2022).
- Cronin J, Moore S, Harding M, Whelton H & Woods N (2021). A cost-effectiveness analysis of community water fluoridation for schoolchildren. *BMC Oral Health*, 21(1):1–12. Available at: <https://doi.org/10.1186/S12903-021-01490-7> (accessed 7 March 2022).
- D'Aiuto F, Gable D, Syed Z, Allen Y, Wanyonyi KL, White S & Gallagher JE (2017). Evidence summary: The relationship between oral diseases and diabetes. *British Dental Journal*, 222:944–8. Available at: <https://doi.org/10.1038/sj.bdj.2017.544> (accessed 7 March 2022).
- Damaskinos P, Koletsi-Kounari H, Economou C, Eaton KA & Widström E (2016). The healthcare system and provision of oral healthcare in European Union Member States. Part 4: Greece. *British Dental Journal*, 220:253–60. Available at: <https://doi.org/10.1038/sj.bdj.2016.180> (accessed 7 March 2022).
- Den Boer JCL, Van Der Sanden WJM & Bruers JJM (2020). Developments in oral health care in the Netherlands between 1995 and 2018. *BMC Oral Health*, 20 (Art. 192). Available at: <https://doi.org/10.1186/s12903-020-01174-8> (accessed 7 March 2022).
- Dental Tribune International (2012). Number of foreign dentists in Finland increases. Available at: <https://eu.dental-tribune.com/news/number-of-foreign-dentists-in-finland-increases/> (accessed 14 May 2021).
- Department of Health (2019). *Smile agus Sláinte, National oral health policy. An overview. Government of Ireland*. Available at: <https://assets.gov.ie/9614/d1be290ee99743f8ba4c0ef9ac4cb401.pdf> (accessed 14 May 2021).
- Di Bella E, Leporatti L, Montefiori M, Krejci I & Ardu S (2017). Popular initiatives in 2014–2016 call for the introduction of mandatory dental care insurance in Switzerland: The contrasting positions at stake. *Health Policy*, 121(6):575–81. Available at: <http://dx.doi.org/10.1016/j.healthpol.2017.04.004> (accessed 16 March 2022).
- Di Bella et al. (2018). What should we expect from Switzerland's compulsory dental insurance reform?. *BMC Health Services Research*, 18:272. Available at: <https://doi.org/10.1186/s12913-018-3065-2> (accessed 16 March 2022).
- Dibello V et al. (2021). Oral frailty and its determinants in older age: a systematic review. *The Lancet Healthy Longevity*, 2(8):e507–e520. Available at: [https://doi.org/10.1016/S2666-7568\(21\)00143-4](https://doi.org/10.1016/S2666-7568(21)00143-4) (accessed 7 March 2022).
- Direção-Geral da Saúde (DGS) (2019). Programa nacional de promoção de saúde oral, Portugal 2019 [National oral health promotion programme, Portugal 2019]. Available at: <https://www.dgs.pt/documentos-em-discussao-publica/programa-nacional-de-promocao-da-saude-oral-2019-em-audicao-publica-ate-1-de-agosto-de-2019-pdf.aspx> (accessed 18 June 2021).

- Dirección General de Salud Pública (2005). *Programa de salud bucodental en los centros docentes, Dossier de presentación para profesionales sanitarios 2005* [Dental health programme in teaching centres, Presentation dossier for health professionals 2005], 34.
- Dirección General de Salud Pública y Participación (2005). *Promoción de la salud bucodental en el ámbito escolar* [Promotion of oral health in the school environment].
- Diz P, Meleti M, Diniz-Freitas M, Vescovi P, Warnakulasuriya S, Johnson N & Kerr AR (2017). Oral and pharyngeal cancer in Europe: Incidence, mortality and trends as presented to the Global Oral Cancer Forum. Available at: <https://doi.org/10.1177/2057178X17701517> (accessed 7 March 2022).
- Dominique C, Ouairirhi M & Kelly R (2018). *L'organisation des soins bucco-dentaires en Allemagne, en Suède et aux Pays-Bas*. Available at: <https://drees.solidarites-sante.gouv.fr/sites/default/files/2020-09/dt136.pdf> (accessed 15 March 2022).
- Dörfer C, Benz C, Aida J & Campard G (2017). The relationship of oral health with general health and NCDs: a brief review. *International Dental Journal*, 67:14–18. Available at: <https://doi.org/10.1111/IDJ.12360> (accessed 7 March 2022).
- DRESS (2019). *La complémentaire santé. Acteurs, bénéficiaires, garanties* [Complementary health. Actors, beneficiaries, guarantees].
- Dublin TC (2021). *Dental Nursing*. Available at: <https://www.tcd.ie/courses/undergraduate/courses/dental-nursing/> (accessed 7 March 2022).
- Eaton KA (2020). Oral healthcare workforce planning in post-Brexit Britain. *British Dental Journal*, 228(10):750–2. Available at: <https://doi.org/10.1038/s41415-020-1579-6> (accessed 8 March 2022).
- Eaton KA & Harris M (2019). *Dental hygienists' professional education, numbers and independent practice in the European Union and European Economic Area*. *Dental Health (BSDHT)*, 58:30–3.
- Eaton KA, Ramsdale M, Leggett H, Csikar J, Vinal K, Whelton H & Douglas G (2019). Variations in the provision and cost of oral healthcare in 11 European countries: a case study. *International Dental Journal*, 69(2): 130–40. Available at: <https://doi.org/10.1111/idj.12437> (accessed 8 March 2022).
- European Commission (1996). *The European Network of Health Promoting Schools: Introduction* (Vol. 55). Available at: <https://doi.org/10.1177/001789699605500410> (accessed 8 March 2022).
- European Commission (2020). *SAN-CAR – mobile dental healthcare provided to rural communities in Romania and Bulgaria*. Available at: https://ec.europa.eu/regional_policy/en/projects/bulgaria/san-car-mobile-dental-healthcare-provided-to-rural-communities-in-romania-bulgaria (accessed 8 March 2022).
- European Commission (2021a). Regulated profession – Dental Technician (United Kingdom). Available at: Retrieved December 17, 2021, from https://ec.europa.eu/growth/tools-databases/regprof/index.cfm?action=regprof&cid_regprof=12065 (accessed 17 December 2021).
- European Commission (2021b). Regulated profession – Dental therapist (United Kingdom). Available at: https://ec.europa.eu/growth/tools-databases/regprof/index.cfm?action=regprof&cid_regprof=1074 (accessed 17 December 2021).
- European Commission (2021c). Regulated professions database. Generic name of profession – Dental assistant/ Dental Nurse. Available at: https://ec.europa.eu/growth/tools-databases/regprof/index.cfm?action=profession&cid_profession=1015&tab=count ries&quid=2&mode=asc&maxRows=* (accessed 17 December 2021).
- European Commission, OECD & European Observatory on Health Systems and Policies (2021). *Country Health Profiles 2021*. Brussels. Available at: https://ec.europa.eu/health/state-health-eu/country-health-profiles_en (accessed 8 March 2022).
- European Parliament (2021). Public health | Fact Sheets on the European Union. Available at: <https://www.europarl.europa.eu/factsheets/en/sheet/49/public-health> (accessed 30 April 2021).

- European Public Health Alliance (EPHA) (2015). *Closing gaps, stimulating health equity: EPHA report on the implementation of the cross-border healthcare directive*. Available at: <http://epha.org/wp-content/uploads/2015/10/EPHA-report-on-implementation-of-cross-border-health-directive.pdf> (accessed 8 March 2022).
- Eurostat (2021). Self-reported unmet needs for dental examination by sex, age, main reason declared and degree of urbanisation. Available at: https://ec.europa.eu/eurostat/databrowser/view/hlth_silc_22/default/table?lang=en (accessed 16 March 2022).
- Farfán Barrios C (2012). *Programa de educación para la salud bucodental infantil en madres y padres de niños entre 0 y 6 años de edad en Pamplona y Comarco - Navarra, España* [Education programme for children's oral health in mothers and fathers of children between 0 and 6 years of age in Pamplona and Comarco – Navarra, Spain]. University of Navarra, thesis, 2012/2013.
- FDI World Dental Federation (2014). FDI policy statement on promoting oral health through water fluoridation: revised version adopted by the FDI General Assembly: 13 September 2014. *International Dentistry Journal*, 64(6):293–4. Available at: <https://www.fdiworlddental.org/promoting-oral-health-through-water-fluoridation> (accessed 8 March 2022).
- FDI World Dental Federation (2015). The Challenge of Oral Disease – A call for global action. The Oral Health Atlas. 2nd edition. *British Dental Journal*, 180:89. Available at: <https://doi.org/10.1038/sj.bdj.4808986> (accessed 8 March 2022).
- FDI World Dental Federation (2021). Dental disaster: One year after first lockdowns dentists around the world confront the consequences of the COVID-19 pandemic on people's oral health. Available at: <https://www.fdiworlddental.org/dental-disaster-one-year-after-first-lockdowns-dentists-around-world-confront-consequences-covid-19> (accessed 23 June 2021).
- Fiehn N-E (2002). Perspectives on Dental Education in the Nordic Countries. *Journal of Dental Education*, 66(12):1374–80. Available at: <https://doi.org/10.1002/j.0022-0337.2002.66.12.tb03611.x> (accessed 8 March 2022).
- France Assos Santé (2019). Les prothèses dentaires bientôt mieux remboursées [Dental prostheses will soon be better reimbursed]. France Assos Santé. Available at: <https://www.france-assos-sante.org/2019/05/20/les-protheses-dentaires-bientot-mieux-remboursees/> (accessed 7 June 2021).
- Freire JM (2003). The Infant Oral Care Programme (PADI) of Navarra and the Basque Country: Achievements and new goals. *Anales Del Sistema Sanitario de Navarra*, 26(3). Available at: <https://doi.org/10.4321/S1137-66272003000500008> (accessed 8 March 2022).
- Gale T, Bryce M, Burns L, Hanks S & Zahra D (2020). *Review and mapping of basic dental training in EU Member States: Final Report*. University of Plymouth.
- Gallagher JE & Eaton KA (2015). Health workforce governance and oral health: Diversity and challenges in Europe. *Health Policy*, 119(12):1565–75. Available at: <https://doi.org/10.1016/j.healthpol.2015.09.010> (accessed 8 March 2022).
- George A, Sousa MS, Kong AC, Blinkhorn A, Patterson Norrie T, Foster J & Dahlen HG (2019). Effectiveness of preventive dental programmes offered to mothers by non-dental professionals to control early childhood dental caries: a review. *BMC Oral Health*, 19(172). Available at: <https://doi.org/10.1186/s12903-019-0862-x> (accessed 8 March 2022).
- GFDI/VDDI (2018). *Atlas Dental, European Markets: Structures, challenges and scenarios. A study from REBMANN RESEARCH with strategy ideas for the European dental industry*. Available at: https://www.gfdi.de/ids-2019/Atlas_Dentalstudie_2018_EN.pdf (accessed 8 March 2022).
- Gheorghe R, Zürcher A & Filippi A (2017). Dental tourism from Switzerland to Germany. *Swiss Dental Journal*, 127(7–8):618–33.

- Glick M, Williams DM, Kleinman DV, Vujicic M, Watt RG & Weyant RJ (2016). A new definition for oral health developed by the FDI World Dental Federation opens the door to a universal definition of oral health. *Journal of the American Dental Association*, 147(12):915–17. Available at: <https://doi.org/10.1016/j.adaj.2016.10.001> (accessed 8 March 2022).
- González GZ, Klazinga N, Ten Asbroek G & Delnoij DM (2006). Performance indicators used to assess the quality of primary dental care. *Community Dental Health*, 23(4):228–35.
- Helsedirektorat (1999). Quality indicators in oral health care: A Nordic project. *Lege Artis Medicinae*, 9(1):60–6. Available at: https://www.helsedirektoratet.no/rapporter/quality-indicators-in-oral-health-care-a-nordic-project-proceedings-in-2012-2018/2019-Nordic-quality-indicators-oral-health.pdf/_attachment/inline/c901a3c8-259b-4484-96d5-34bdf5d85b33:3c3f67502008c978f39e5c739b4157d0b98dd25f/2019-Nordic-quality-indicators-oral-health.pdf (accessed 8 March 2022).
- Helsenorge (2019). Who pays your dental bill? Available at: <https://www.helsenorge.no/en/payment-for-health-services/who-pays-your-dental-bill/#dental-treatment-for-adolescents-19-20-years-of-age> (accessed 8 March 2022).
- Hempel FM, Krois J, Paris S, Beuer F, Kuhlmeier A & Schwendicke F (2020). Prosthetic treatment patterns in the very old: an insurance database analysis from Northeast Germany. *Clinical Oral Investigations*, 24(11):3981–95. Available at: <https://doi.org/10.1007/s00784-020-03264-x> (accessed 8 March 2022).
- Henry E, Brick A & Keegan C (2021). *Utilisation of publicly financed dental and optical services in Ireland and baseline analysis for the hippocrates model ESRI survey and statistical report series number 99*. Available at: <https://doi.org/10.26504/sustat99> (accessed 8 March 2022).
- Holmes RD, Burford B & Vance G (2020). Development and retention of the dental workforce: Findings from a regional workforce survey and symposium in England. *BMC Health Services Research*, 20(1):1–11. Available at: <https://doi.org/10.1186/S12913-020-4980-6> (accessed 8 March 2022).
- Igić M, Apostolović M, Kostadinović L, Tricković-Janjić O & Surdilović D (2008). [The importance of health education in prevention of oral health in children]. *Medicinski Pregled*, 61(1–2):65–70. Available at: <https://doi.org/10.2298/MPNS0802065I> (accessed 8 March 2022).
- IHME (2020). *Global Burden of Disease Collaborative Network: Global Burden of Disease Study 2019 (GBD 2019) Results*. Seattle, United States: Institute for Health Metrics and Evaluation (IHME). Available at: <http://ghdx.healthdata.org/gbd-results-tool> (accessed 15 March 2022).
- Inchley J et al. (2016). *Growing Up Unequal: Gender and Socioeconomic Differences in Young People's Health and Well-Being. Health Behaviour in School-Aged Children (HBSC) Study: International Report from the 2013/2014 Survey*. Copenhagen.
- INE (2020). Profesionales sanitarios colegiados 2016, N° de Dentistas por Comunidades, Ciudades autónomas y Provincias de colegiación, edad y sexo [Registered health professionals 2016, Number of Dentists by Communities, Autonomous Cities and Provinces, by registration, age and sex. Available at: <https://www.ine.es/jaxi/Tabla.htm?path=/t15/p416/a2016/&file=s03002.px> (accessed 16 March 2022).
- Instituto Nacional de Estadística (INE) (2021a). Cifras oficiales de población resultantes de la revisión del Padrón municipal a 1 de enero [Official population figures resulting from the revision of the Municipal Register as of 1 January]. Available at: <https://www.ine.es/jaxiT3/Tabla.htm?t=2913&L=0> (accessed 8 March 2022).
- Instituto Nacional de Estadística (INE) (2021b). Dentistas colegiados por año y sexo [Registered dentists by year and sex]. Available at: <https://www.ine.es/jaxi/Datos.htm?path=/t15/p416/serie/10/&file=s03001.px> (accessed 8 March 2022).

- Irish Dental Trade Association (IDTA) (2018). Europe-wide study reveals huge gulf in dental prices. Available at: <https://www.idta.eu/europe-wide-study-reveals-huge-gulf-dental-prices/> (accessed 8 March 2022).
- Johannsen A, Malmqvist S, Graça S, Assunção V, Albuquerque T & Luis H (2019). The dental hygienists in Sweden and Portugal: A comparative study. *Journal of International Society of Preventive and Community Dentistry*, 9(3):296–302. Available at: https://doi.org/10.4103/jispcd.jispcd_1_19 (accessed 8 March 2022).
- Jongbloed-Zoet C, Nyblom Y, Bol E & Field JC (2020a). A common European curriculum for dental hygiene. *European Journal of Dental Education: Official Journal of the Association for Dental Education in Europe*, 24(4):611–15. Available at: <https://doi.org/10.1111/EJE.12501> (accessed 8 March 2022).
- Jürgensen N & Petersen PE (2013). Promoting oral health of children through schools – Results from a WHO global survey 2012. *Community Dental Health*, 30(4):204–18.
- Karanikolos M et al. (2013). Financial crisis, austerity, and health in Europe. *The Lancet*, 381(9874):1323–31. Available at: [https://doi.org/10.1016/S0140-6736\(13\)60102-6](https://doi.org/10.1016/S0140-6736(13)60102-6) (accessed 8 March 2022).
- Kestens W, Brabant S & Peeters M (2019). *Quelle est la fréquence de visite des personnes âgées chez le dentiste?* [How often do elderly people visit the dentist?] Available at: <https://www.mloz.be/fr/publications/studies-en-analyses/quelle-est-la-frequence-de-visite-des-personnes-agees-chez-le> (accessed 8 March 2022).
- Kidd JBR, McMahon AD, Sherriff A, Gnich W, Mahmoud A, MacPherson LMD & Conway DI (2020). Evaluation of a national complex oral health improvement programme: A population data linkage cohort study in Scotland. *BMJ Open*, 10(11):1–10. Available at: <https://doi.org/10.1136/bmjopen-2020-038116> (accessed 8 March 2022).
- Klingenberg D, Winkelmann J & Henschke C (2021). *Best Oral Health Practice in Europe? Eine Analyse zur Frage der Vergleichbarkeit der Effizienz zahnmedizinischer Versorgungssysteme* [An Analysis of the comparability of the efficiency of dental care systems]. *Zahnmedizin, Forschung und Versorgung*, 4(2):1–75. Available at: www.idz.institute/fileadmin/Content/Publikationen-PDF/ZahnmedForschVersorg-2_2021_4_2_2.pdf (accessed 16 March 2022).
- Klingenberg D, Schneider M, Hofmann U & Köse A (2015). *Comparison of Dental Fees in Europe*. Cologne, Deutscher Zahnärzte Verlag.
- König J, Holtfreter B & Kocher T (2010). Periodontal health in Europe: Future trends based on treatment needs and the provision of periodontal services – position paper 1. *European Journal of Dental Education*, 14(SUPPL. 1):4–24. Available at: <https://doi.org/10.1111/j.1600-0579.2010.00620.x> (accessed 8 March 2022).
- Kossioni AE et al. (2018). An Expert Opinion from the European College of Gerodontology and the European Geriatric Medicine Society: European Policy Recommendations on Oral Health in Older Adults. *Journal of the American Geriatrics Society*, 66(3):609–13. Available at: <https://doi.org/10.1111/jgs.15191> (accessed 8 March 2022).
- Kravitz A & Treasure ET (2004). *Manual of dental practice 2004*. Council of European Dentists.
- Kravitz A, Bullock A & Cowpe J (2015). *Manual of Dental Practice 2015*. Council of European Dentists.
- Kroneman M, Boerma W, van den Berg M, Groenewegen P, de Jong J & van Ginneken E (2016). The Netherlands: Health System Review. *Health Systems in Transition*, 18(2):1–239.
- L'information dentaire (2020). Paradoxe: malgré la réforme « 100 % santé », le reste à charge en dentaire augmente quand même – L'Information Dentaire [Paradox – despite the « 100% health reform, the rest to be paid for in dentistry is still increasing]. Available at: <https://www.information-dentaire.fr/actualites/paradoxe-malgre-la-reforme-100-sante-le-reste-a-charge-en-dentaire-augmente-quand-meme/> (accessed 11 June 2021).

- Leggett H, Csikar J, Vinall-Collier K & Douglas GVA (2021). Whose Responsibility Is It Anyway? Exploring Barriers to Prevention of Oral Diseases across Europe. *JDR Clinical and Translational Research*, 6(1):96–108. Available at: <https://doi.org/10.1177/2380084420926972> (accessed 8 March 2022).
- Leinsalu M, Reile R, Vals K, Petkeviciene J, Tekkel M & Stickley A (2018). Macroeconomic changes and trends in dental care utilization in Estonia and Lithuania in 2004–2012: A repeated cross-sectional study. *BMC Oral Health*, 18 (Art. 199). Available at: <https://doi.org/10.1186/s12903-018-0665-5> (accessed 8 March 2022).
- Levine RS (2021). Childhood caries and hospital admissions in England: a reflection on preventive strategies. *British Dental Journal*, 230(9):611–16. Available at: <https://doi.org/10.1038/s41415-021-2945-8> (accessed 8 March 2022).
- Listl S, Moeller J & Manski R (2014). A multi-country comparison of reasons for dental non-attendance. *European Journal of Oral Sciences*, 122(1):62–9. Available at: <https://doi.org/10.1111/eos.12096> (accessed 8 March 2022).
- Locker D (1999). Benefits and Risks of Water Fluoridation: An Update of the 1996 Federal-Provincial Sub-committee Report. *Toronto: Ontario Ministry of Health*.
- Loukil A (2020). Santé: ces soins dentaires qui ne vous coûtent plus rien en 2020 [Health: these dental treatments no longer cost you anything in 2020]. Available at: <https://www.capital.fr/votre-argent/sante-ces-soins-dentaires-qui-ne-vous-cootent-plus-rien-en-2020-1360402> (accessed 4 February 2021).
- Luciak-Donsberger C (2003). Origins and benefits of dental hygiene practice in Europe. *International Journal of Dental Hygiene*, 1(1):29–42. doi: 10.1034/j.1601-5037.2003.00008.x.
- Lupi-Pegurier L, Clerc-Urmes I, Abu-Zaineh M, Paraponaris A & Ventelou B (2011). Density of dental practitioners and access to dental care for the elderly: A multilevel analysis with a view on socio-economic inequality. *Health Policy*, 103(2–3):160–7. Available at: <https://doi.org/10.1016/j.healthpol.2011.09.011> (accessed 8 March 2022).
- Luzzi L & Spencer AJ (2008). Factors influencing the use of public dental services: An application of the Theory of Planned Behaviour. *BMC Health Services Research*, 8 (Art. 93). Available at: <https://doi.org/10.1186/1472-6963-8-93> (accessed 8 March 2022).
- McCarron M, Haigh M & McCallion P (2017). *Health, Wellbeing and Social Inclusion: Ageing with an Intellectual Disability in Ireland. Evidence from the First Ten Years of The Intellectual Disability Supplement to The Irish Longitudinal Study on Ageing (IDS-TILDA)*. Dublin.
- McDonagh MS et al. (2000). Systematic review of water fluoridation. *British Medical Journal*, 321:855. Available at: <https://doi.org/10.1136/bmj.321.7265.855> (accessed 8 March 2022).
- Malkiewicz K, Malkiewicz E, Eaton KA & Widström E (2016). The healthcare system and the provision of oral healthcare in European Union Member States. Part 6: Poland. *British Dental Journal*, 221:501–7. Available at: <https://doi.org/10.1038/sj.bdj.2016.780> (accessed 8 March 2022).
- Manski R & Moeller J (2017). Barriers to oral health across selected European countries and the USA. *International Dental Journal*, 67(3):133–8. Available at: <https://doi.org/10.1111/idj.12283> (accessed 8 March 2022).
- Manski R, Moeller J, Chen H, Widström E & Listl S (2017). Disparity in dental out-of-pocket payments among older adult populations: a comparative analysis across selected European countries and the USA. *International Dental Journal*, 67(3):157–71. Available at: <https://doi.org/10.1111/idj.12284> (accessed 8 March 2022).
- Maynard K (2010). Being a dental hygienist is just wonderful. *Vital*, 7:18–20. Available at: <https://doi.org/10.1038/vital1133> (accessed 8 March 2022).
- Mays KA (2021). Designing Oral Health Curriculum That Facilitates Greater Integration of Oral Health Into Overall Health. *Frontiers in Dental Medicine*, 9 August 2021. Available at: <https://doi.org/10.3389/FDMED.2021.680520> (accessed 8 March 2022).
- Medical Research Council (2002). Water fluoridation and health. Working group report. In *Medical Research Council working group report*. London.

- Mertz E, Self K, Moore J & Maxey H (2021). The Oral Health Workforce. *Burt and Eklund's Dentistry, Dental Practice, and the Community*, 7th edn, 80–91. Available at: <https://doi.org/10.1016/B978-0-323-55484-8.00008-3> (accessed 8 March 2022).
- Miller NA, Roland E & Benhamgar L (1994). Evaluation of the community periodontal index of treatment needs (CPITN): summary. *World Health Statistics Quarterly*, 47(2):65–74.
- Ministère des Solidarités et de la Santé (2019). 100% Santé. Des soins pour tous, 100% pris en charge [100% Health. Care for all, 100% covered]. Available at: https://www.ameli.fr/fileadmin/user_upload/documents/100pour100-sante-2019-301219.pdf (accessed 29 January 2021).
- MISSOC (2019). Mutual Information System on Social Protection. Available at: <https://www.missoc.org/missoc-database/> (accessed 16 March 2022).
- Miyazaki H, Jones JA & Beltrán-Aguilar ED (2017). Surveillance and monitoring of oral health in elderly people. *International Dental Journal*, 67(2):34–41. Available at: <https://doi.org/10.1111/idj.12348> (accessed 8 March 2022).
- Mullen J (2005). History of water fluoridation. *British Dental Journal*, 199:1–4. Available at: <https://doi.org/10.1038/sj.bdj.4812863> (accessed 8 March 2022).
- my dentists (2021). mydentist. your local dentist. Available at: <https://www.mydentist.co.uk/about-us> (accessed 16 December 2021).
- Nakre P & Harikiran A (2013). Effectiveness of oral health education programmes: A systematic review. *Journal of International Society of Preventive and Community Dentistry*, 3(2):103. Available at: <https://doi.org/10.4103/2231-0762.127810> (accessed 8 March 2022).
- NHS (2021). How much will I pay for NHS dental treatment? NHS. Available at: <https://www.nhs.uk/nhs-services/dentists/dental-costs/how-much-will-i-pay-for-nhs-dental-treatment/> (accessed 30 April 2021).
- NHS Digital (2021). NHS Dental Statistics for England – 2020–21 Annual Report. Available at: <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-dental-statistics/2020-21-annual-report#> (accessed 16 November 2021).
- NHS Scotland Information Services Division (2012). *National Dental Inspection Programme (NDIP) 2017. Report of the 2017 Detailed National Dental Inspection Programme of Primary 7 Children and the Basic Inspection of Primary 1 and Primary 7 children.*
- Nihtilä A (2010). *A Nordic Project of Quality Indicators for Oral Health Care.* Available at: <https://www.julkari.fi/bitstream/handle/10024/80108/a389b3ed-a262-44c5-bad0-b9d3eeedf089.pdf?sequence=1&isAllowed=y> (accessed 8 March 2022).
- O'Dowd A (2019). Brexit delay is hurting dentistry recruitment. *British Dental Journal*, 227(3):179–82. Available at: <https://doi.org/10.1038/S41415-019-0658-Z> (accessed 8 March 2022).
- Oancea R, Amariei C, Eaton KA & Widström E (2016). The healthcare system and the provision of oral healthcare in European Union Member States: Part 5: Romania. *British Dental Journal*, 220:361–6. Available at: <https://doi.org/10.1038/sj.bdj.2016.265> (accessed 8 March 2022).
- Observatoire National de la Démographie des Professions de Santé (2013). *État des lieux de la démographie des chirurgiens-dentistes.*
- ODM (2020). Governo quer medicina dentária em todos os centros de saúde [Government wants dental medicine in all health centres]. Available at: <https://www.omb.pt/2020/01/centros-saude-governo/> (accessed 16 December 2021).
- Odontoiatria33 (2016). Dentista, tra le professioni più 'anziane': pochi giovani e tanti futuri pensionati. Un problema per chi smetterà? [Dentistry, among the 'oldest' professions: few young people and many future retirees. A problem for those who will quit?] Available at: <http://www.odontoiatria33.it/approfondimenti/12391/dentista-tra-le-professioni-piu-anziane-pochi-giovani-e-tanti-futuri-pensionati-un-problema-per-chi-smettera.html> (accessed 14 May 2021).

- OECD (2009). *Health at a Glance 2009. Health indicators*. Available at: <https://www.oecd.org/health/health-systems/44117530.pdf> (accessed 8 March 2022).
- OECD (2016). *Health at a Glance*. Available at: https://www.aph.gov.au/About-Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BN/2011-2012/DentalSchemes (accessed 8 March 2022).
- OECD (2019a). Health for Everyone? Social inequalities in health and health systems. *OECD Health Policy Studies*. Available at: <https://doi.org/10.1787/3c8385d0-en> (accessed 8 March 2022).
- OECD (2019b). Health at a Glance 2019: OECD Indicators, OECD Publishing, Paris. Available at: <https://doi.org/10.1787/4dd50c09-en> (accessed 15 March 2022).
- OECD (2020). Availability of dentists and consultations with dentists | Health at a Glance: Europe 2020: State of Health in the EU Cycle. Available at: <https://www.oecd-ilibrary.org/sites/9172ab9f-en/index.html?itemId=/content/component/9172ab9f-en> (accessed 17 December 2021).
- OECD Health Statistics (2021). Available at: <https://www.oecd.org/health/health-data.htm> (accessed 15 March 2022).
- OECD/European Observatory on Health Systems and Policies (2019). France: Country Health Profile 2019, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels.
- OECD/Eurostat/WHO (2017). *A System of Health Accounts 2011: Revised edition*.
- ÖGK (2021). Zahngesundheit. Available at: <https://www.gesundheitskasse.at/cdscontent/?contentid=10007.867388&portal=oegkportal> (accessed 15 March 2021).
- Oltean FD, Gabor MR, Stăncioiu A-F, Kardos M, Kiss M & Marinescu RC (2020). Aspects of Marketing in Dental Tourism – Factor of Sustainable Development in Romania. *Sustainability*, 12(10):4320. Available at: <https://doi.org/10.3390/su12104320> (accessed 8 March 2022).
- Or Z & Gandre C (2019). Case Study France. In SL Barber, L Lorenzoni & P Ong (eds), *Price setting and price regulation in health care. Lessons for advancing Universal Health Coverage*. Available at: <https://www.oecd.org/health/health-systems/OECD-WHO-Price-Setting-Case-Studies.pdf> (accessed 8 March 2022).
- Palência L, Espelt A, Cornejo-Ovalle M & Borrell C (2014). Socioeconomic inequalities in the use of dental care services in Europe: What is the role of public coverage? *Community Dentistry and Oral Epidemiology*, 42(2):97–105. Available at: <https://doi.org/10.1111/cdoe.12056> (accessed 8 March 2022).
- Pälvärinne R, Widström E, Forsberg BC, Eaton KA & Birkhed D (2018). The healthcare system and the provision of oral healthcare in European Union Member States. Part 9: Sweden. *British Dental Journal*, 224:647–51. Available at: <https://doi.org/10.1038/sj.bdj.2018.269> (accessed 8 March 2022).
- Patel R (2012). *The state of oral health in Europe. Report Commissioned by the Platform for Better Oral Health in Europe*. Available at: <https://doi.org/10.1080/10455750308565526> (accessed 8 March 2022).
- Patel R, Eaton KA, Pitts NB, Schulte A, Pieper K & White S (2016). Variation in methods used to determine national mean DMFT scores for 12-year-old children in European countries. *Community Dental Health*, 33(4):286–91.
- Pegon-Machat E, Jourdan D & Tubert-Jeannin S (2018). Inégalités en santé orale: déterminants de l'accès à la prévention et aux soins en France [Inequalities in oral health: determinants of access to prevention and care in France]. *Santé Publique*, 30(2):243–51. Available at: <https://doi.org/10.3917/spub.182.0243> (accessed 8 March 2022).
- Peres MA, Daly B, Guarnizo-Herreño CC, Benzian H & Watt RG (2020). Oral diseases: a global public health challenge – Authors' reply. *The Lancet*, 395(10219):186–7. Available at: [https://doi.org/10.1016/S0140-6736\(19\)32997-6](https://doi.org/10.1016/S0140-6736(19)32997-6) (accessed 8 March 2022).
- Peres MA et al. (2019). Oral diseases: a global public health challenge. *The Lancet*, 394(10194):249–60. Available at: [https://doi.org/10.1016/S0140-6736\(19\)31146-8](https://doi.org/10.1016/S0140-6736(19)31146-8) (accessed 8 March 2022).

- Petersen PE (2003). *Changing oral health profiles of children in Central and Eastern Europe – Challenges for the 21st century*. Available at: http://www.who.int/oral_health/media/en/orh_eastern_europe.pdf (accessed 8 March 2022).
- Peterson PE & Lennon MA (2004). Effective use of fluorides. WHO approach. *Community Dentistry and Oral Epidemiology*, 32:319–21.
- Pipitone B & Eaton K (2013). Promoting oral health: a cent of prevention costs less than a euro of cure. *Eurohealth*, 19(4):34–6.
- Platform for Better Oral Health in Europe (2015). *Best practices in oral health promotion and prevention from across Europe: an overview prepared by the platform for better oral health in Europe*. Available at: <http://www.oralhealthplatform.eu/wp-content/uploads/2015/10/Best-practices-collection.pdf> (accessed 16 March 2022).
- Platform for Better Oral Health in Europe (2019). *Why Oral Health Matters? Policy recommendations to improve oral health in the EU*. Available at: <http://www.oralhealthplatform.eu/news/platform-launches-manifesto-in-european-parliament/> (accessed 8 March 2022).
- Portalidentystyczny (2018). Co wynika z nowych badań demografii lekarzy dentystów? [What is emerging from the new survey of dentist demographics?] Available at: <http://www.portalidentystyczny.pl/student/wiadomosci/art1227,co-wynika-z-nowych-badan-demografii-lekarzy-dentystow.html> (accessed 14 May 2021).
- Praktikertjänst (2021). Praktikertjänst in English about. Available at: <https://www.praktikertjanst.se/praktikertjanst-in-english/> (accessed 6 December 2021).
- Preshaw PM, Alba AL, Herrera D, Jepsen S, Konstantinidis A, Makrilakis K & Taylor R (2012). Periodontitis and diabetes: a two-way relationship. *Diabetologia*, 55(1):21. Available at: <https://doi.org/10.1007/S00125-011-2342-Y> (accessed 8 March 2022).
- Rechel B, Maresso A & van Ginneken E (2019). *Template for authors 2019. Health Systems in Transition* (ed. European Observatory on Health Systems and Policies). Copenhagen: WHO Regional Office for Europe.
- Reda SF, Reda SM, Murray Thomson W & Schwendicke F (2018). Inequality in Utilization of Dental Services: A Systematic Review and Meta-analysis. *American Journal of Public Health*, 108(2):e1–e7. Available at: <https://doi.org/10.2105/AJPH.2017.304180> (accessed 8 March 2022).
- Rice T, Quentin W, Anell A, Barnes AJ, Rosenau P, Unruh LY & Van Ginneken E (2018). Revisiting out-of-pocket requirements: Trends in spending, financial access barriers, and policy in ten high-income countries. *BMC Health Services Research*, 18 (Art. 371). Available at: <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-018-3185-8> (accessed 8 March 2022).
- Rigo L, Dalazen J & Garbin RR (2016). Impact of dental orientation given to mothers during pregnancy on oral health of their children. *Einstein (Sao Paulo, Brazil)*, 14(2):219–25. Available at: <https://doi.org/10.1590/S1679-45082016AO3616> (accessed 8 March 2022).
- Sagan A & Thomson S (2016a). Voluntary health insurance in Europe: Role and regulation. *Observatory Studies Series, World Health Organization*.
- Sagan A & Thomson S (2016b). Voluntary health insurance in Europe. Country experience. *European Observatory Studies Series*, 42.
- Schwendicke F, Dörfer CE & Meier T (2018). Global smoking-attributable burden of periodontal disease in 186 countries in the year 2015. *Journal of Clinical Periodontology*, 45(1):2–14. Available at: <https://doi.org/10.1111/jcpe.12823> (accessed 8 March 2022).
- Schwendicke F et al. (2019). When to intervene in the caries process? An expert Delphi consensus statement. *Clinical Oral Investigations*, 23(10):3691–703. Available at: <https://doi.org/10.1007/S00784-019-03058-W> (accessed 8 March 2022).
- Scientific Committee on Health and Environmental Risks (SCHER) (2010). *Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water*. Brussels.

- Scope of Practice General Dental Council (2013). Available at: www.gdc-uk.org (accessed 8 March 2022).
- Sheiham A & James WPT (2013). A new understanding of the relationship between sugars, dental caries and fluoride use: Implications for limits on sugars consumption. *Public Health Nutrition*, 17(10):2176–84. Available at: <https://doi.org/10.1017/S136898001400113X> (accessed 8 March 2022).
- Sheiham A & Watt RG (2000). The common risk factor approach: a rational basis for promoting oral health. *Community Dentistry and Oral Epidemiology*, 28(6):399–406. Available at: <https://doi.org/10.1034/J.1600-0528.2000.028006399.X> (accessed 8 March 2022).
- Simões J, Figueiredo Augusto G, do Céu A, Ferreira MC, Jordão M, Calado R & Fronteira I (2018). Ten years since the 2008 introduction of dental vouchers in the Portuguese NHS. *Health Policy*, 122(8):803–7. Available at: <https://doi.org/10.1016/j.healthpol.2018.07.013> (accessed 8 March 2022).
- Simón Salazar F & Aguirre Urizar J (2015). 25 años del PADI en el País Vasco (1990–2014) [Twenty-five years of PADI in the Basque Country 1990–2014]. *RCOE: Revista Del Ilustre Consejo General de Colegios de Odontólogos y Estomatólogos de España*, 20(3):165–78.
- Sjúkratryggingar Íslands (2019). Dental care – Icelandic Health Insurance. Available at: <https://www.sjukra.is/english/social-insurance-in-iceland/dental-care/> (accessed 14 June 2021).
- SNS (2016). Projeto-piloto de saúde oral arranca em 13 centros de saúde – SNS [Oral health pilot project starts in 13 health centres – SNS]. Available at: <https://www.sns.gov.pt/noticias/2016/03/22/projeto-piloto-arranca-em-13-centros-de-saude/> (accessed 16 December 2021).
- Sowada C et al. (2019). Poland Health System Review. *Health Systems in Transition*, 21(1).
- Statistics Norway (2020). Tannleger med og uten spesialitet med utenlandsk landbakgrunn, etter landsdel og landbakgrunn 2003–2019 [Dentists with and without specialty with foreign country background, by region and country background, 2003–2019]. Statistikkbanken. Available at: <https://www.ssb.no/statbank/table/05680> (accessed 30 April 2021).
- Strippel H (2008). Oral Health Promotion. In W Kirch et al. (eds), *Encyclopedia of Public Health*. Dordrecht: Springer, 1049–52. Available at: https://doi.org/10.1007/978-1-4020-5614-7_2454 (accessed 8 March 2022).
- Struckmann V, Augustin U, Panteli D & Busse R (2017). Erfahrungen deutscher Zahnärzte mit grenzüberschreitender zahnärztlicher Versorgung [Experiences of German dentists with cross-border dental care]. *Deutsche Zahnärztliche Zeitschrift*, 72(6).
- Sygeforsikringen Danmark (2021). Tandbehandling [Dental treatment]. Available at: <https://www.sygeforsikring.dk/tilskud/tandbehandling> (accessed 14 June 2021).
- Tan SS, Redekop WK & Rutten FFH (2008). Costs and prices of single dental fillings in Europe: A micro-costing study. *Health Economics*, 17(S1):S83–S93. Available at: <https://doi.org/10.1002/hec.1326> (accessed 8 March 2022).
- Terpenning M (2005). Geriatric Oral Health and Pneumonia Risk. *Clinical Infectious Diseases*, 40(12):1807–10. Available at: <https://academic.oup.com/cid/article/40/12/1807/314357> (accessed 8 March 2022).
- Thomson S, Cylus J & Evetovits T (2019). *Can people afford to pay for health care? New evidence on financial protection in Europe*. World Health Organization, Regional Office for Europe. Available at: <https://apps.who.int/iris/bitstream/handle/10665/311654/9789289054058-eng.pdf?sequence=1&isAllowed=y> (accessed 8 March 2022).
- Thomson S et al. (2013). Economic Crisis, Health Systems and Health in Europe. Impact and implications for policy. *European Observatory on Health Systems and Policies Series*.

- Trescher AL, Listl S, van der Galien O, Gabel F & Kalmus O (2020). Once bitten, twice shy? Lessons learned from an experiment to liberalize price regulations for dental care. *European Journal of Health Economics*, 21:425–36. Available at: <https://doi.org/10.1007/s10198-019-01145-z> (accessed 8 March 2022).
- Tuominen R & Eriksson AL (2012). Patient experiences during waiting time for dental treatment. *Acta Odontologica Scandinavica*, 70(1):21–6. doi: 10.3109/00016357.2011.575079. Epub 2011 Apr 19. PMID: 21504269.
- Urbanos-Garrido RM (2020). Income-related inequalities in unmet dental care needs in Spain: traces left by the Great Recession. *International Journal for Equity in Health*, 19:207. Available at: <https://doi.org/10.1186/s12939-020-01317-x> (accessed 16 March 2022).
- Vlădescu C, Silvia V, Scintee G, Olsavszky V, Hernández-Quevedo C & Sagan A (2016). Health Systems in Transition: Romania, vol. 18, no. 4.
- Vozza I, Guerra F, Marchionne M, Bove E, Corridore D & Ottolenghi L (2014). A multimedia oral health-promoting project in primary schools in central Italy. *Annali Di Stomatologia*, 5(3):87–90.
- Watt RG & Serban S (2020). Multimorbidity: a challenge and opportunity for the dental profession. *British Dental Journal*, 229:282–6. Available at: <https://doi.org/10.1038/s41415-020-2056-y> (accessed 8 March 2022).
- Watt RG et al. (2019). Ending the neglect of global oral health: time for radical action. *The Lancet*, 394(10194):261–72. Available at: [https://doi.org/10.1016/S0140-6736\(19\)31133-X](https://doi.org/10.1016/S0140-6736(19)31133-X) (accessed 8 March 2022).
- WHO (2010). World Health Report: health systems financing: the path to universal coverage. Geneva, World Health Organization.
- WHO (2013). *Oral Health Surveys Basic Methods 5th Edition*.
- WHO (2015). *Guideline: sugars intake for adults and children*. Available at: <https://www.who.int/publications/i/item/9789241549028> (accessed 8 March 2022).
- WHO (2019). Preventing disease through healthy environments: inadequate or excess fluoride: a major public health concern. Available at: <https://apps.who.int/iris/handle/10665/329484> (accessed 20 December 2021).
- WHO (2020a). Oral health. Achieving better oral health as part of the universal health coverage and noncommunicable disease agendas towards 2030, Report by the Director-General. In *WHO EXECUTIVE BOARD 148th session Provisional agenda item 6*. Available at: https://apps.who.int/gb/ebwha/pdf_files/EB148/B148_8-en.pdf (accessed 8 March 2022).
- WHO (2020b). Oral health. Key facts. Available at: <https://www.who.int/news-room/fact-sheets/detail/oral-health> (accessed 8 March 2022).
- WHO (2021a). *Oral health resolution EB148.R1*.
- WHO (2021b). World Health Assembly Resolution paves the way for better oral health care. Available at: <https://www.who.int/news/item/27-05-2021-world-health-assembly-resolution-paves-the-way-for-better-oral-health-care> (accessed 22 June 2021).
- WHO Regional Office for Europe (2018a). *Factsheet. Tobacco and oral health*. Available at: https://www.euro.who.int/_data/assets/pdf_file/0005/369653/Fact-Sheet-on-Tobacco-and-Oral-Health-2018-eng.pdf?ua=1 (accessed 8 March 2022).
- WHO Regional Office for Europe (2018b). *Oral health*. Available at: <https://www.euro.who.int/en/health-topics/disease-prevention/oral-health> (accessed 8 March 2022).
- WHO Regional Office for Europe (2018c). *Tobacco and oral health*. Available at: <https://doi.org/10.9790/0853-1396120124> (accessed 8 March 2022).
- Widström E, Eaton KA & Luciak-Donsberger C (2010). Changes in dentist and dental hygienist numbers in the European Union and Economic Area. *International Dental Journal*, 60(4):3111–16.
- Widström E, Broukal Z, Borutta A & Dybizbánska E (2001). Oral healthcare in transition in Eastern Europe. *British Dental Journal*, 190(11):580–4.

- Widström E, Agustsdóttir H, Byrkjeflot L, Pälvärinne R & Christensen L (2015). Systems for provision of oral health care in Nordic countries. *Tandlaegebladet*, 116(9):702–11.
- Winkelmann J, Gómez Rossi J, Schwendicke F, Dimova A, Atanasova E, Habicht T, et al. (2022). Exploring variation of coverage and access to dental care for adults in 11 European countries: a vignette approach. *BMC Oral Health* 22, 65 (2022). Available at: <https://doi.org/10.1186/s12903-022-02095-4>.
- Winkelmann J, Hofmarcher M, Kovacs E & Szocska G (2013). Cross-border dental care between Austria and Hungary. *Eurohealth*.
- Woods N, Ahern S, Burke F, Eaton KA & Widström E (2017). The healthcare system and the provision of oral healthcare in European Union Member States. Part 7: Republic of Ireland. *British Dental Journal*, 222:541–8. Available at: <https://doi.org/10.1038/sj.bdj.2017.317> (accessed 8 March 2022).
- Zahnklinik Ungarn (2020). Zuschuss Krankenkasse: Erstattung bei Zahnbehandlung in Ungarn [Health insurance subsidy: reimbursement for dental treatment in Hungary]. Available at: April 30, 2021, from <https://www.zahnklinik-ungarn.de/erstattung-krankenkasse-zahnbehandlung-ungarn.php> (accessed 30 April 2021).
- Ziller S, Eaton KE & Widström E (2015). The healthcare system and the provision of oral healthcare in European Union Member States. Part 1: Germany. *British Dental Journal*, 218:239–44. Available at: <https://doi.org/10.1038/sj.bdj.2015.95> (accessed 8 March 2022).
- Zoltan J & Maggi R (2015). *What is Tourism in Dental Tourism?* Available at: https://ssl.lu.usi.ch/entitywvs/Allegati/pdf_pub5354.pdf (accessed 8 March 2022).

9.2 HiT methodology and production process

HiTs are produced by country experts in collaboration with the Observatory's research directors and staff. They are based on a template that, revised periodically, provides detailed guidelines and specific questions, definitions, suggestions for data sources and examples needed to compile reviews. While the template offers a comprehensive set of questions, it is intended to be used in a flexible way to allow authors and editors to adapt it to their particular national context. The latest version of the template (2019) is available on the Observatory website at <https://eurohealthobservatory.who.int/publications/i/health-systems-in-transition-template-for-authors>.

Authors draw on multiple data sources for the compilation of HiTs, ranging from national statistics, national and regional policy documents, to published literature. Furthermore, international data sources may be incorporated, such as those of the OECD and the World Bank. The OECD Health Data contain over 1200 indicators for the 34 OECD countries. Data are drawn from information collected by national statistical bureaux and health ministries. The World Bank provides World Development Indicators, which also rely on official sources.

In addition to the information and data provided by the country experts, the Observatory supplies quantitative data in the form of a set of standard comparative figures for each country, drawing on the European Health for All database. The Health for All database contains more than 600 indicators defined by the WHO Regional Office for Europe for the purpose of monitoring Health in All Policies in Europe. It is updated for distribution twice a year from various sources, relying largely upon official figures provided by governments, as well as health statistics collected by the technical units of the WHO Regional Office for Europe. The standard Health for All data have been officially approved by national governments.

HiT authors are encouraged to discuss the data in the text in detail, including the standard figures prepared by the Observatory staff, especially if there are concerns about discrepancies between the data available from different sources.

A typical HiT consists of nine chapters.

1. Introduction: outlines the broader context of the health system, including geography and sociodemography, economic and political context, and population health.
2. Organization and governance: provides an overview of how the health system in the country is organized, governed, planned and regulated, as well as the historical background of the system; outlines the main actors and their decision-making powers; and describes the level of patient empowerment in the areas of information, choice, rights and cross-border health care.
3. Financing: provides information on the level of expenditure and the distribution of health spending across different service areas, sources of revenue, how resources are pooled and allocated, who is covered, what benefits are covered, the extent of user charges and other out-of-pocket payments, voluntary health insurance and how providers and health workers are paid.
4. Physical and human resources: deals with the planning and distribution of capital stock and investments, infrastructure and medical equipment; the context in which IT systems operate; and human resource input into the health system, including information on workforce trends, professional mobility, training and career paths.

5. Provision of services: concentrates on the organization and delivery of services and patient flows, addressing public health, primary care, secondary and tertiary care, day care, emergency care, pharmaceutical care, rehabilitation, long-term care, services for informal carers, palliative care, mental health care and dental care.
6. Principal health reforms: reviews reforms, policies and organizational changes; and provides an overview of future developments.
7. Assessment of the health system: provides an assessment of systems for monitoring health system performance, the impact of the health system on population health, access to health services, financial protection, health system efficiency, health care quality and safety, and transparency and accountability.
8. Conclusions: identifies key findings, highlights the lessons learned from health system changes; and summarizes remaining challenges and future prospects.
9. Appendices: includes references and useful websites.

The quality of HiTs is of real importance since they inform policy-making and meta-analysis. HiTs are the subject of wide consultation throughout the writing and editing process, which involves multiple iterations. They are then subject to the following.

- A rigorous review process.
- There are further efforts to ensure quality while the report is finalized that focus on copy-editing and proofreading.
- HiTs are disseminated (hard copies, electronic publication, translations and launches).

The editor supports the authors throughout the production process and in close consultation with the authors ensures that all stages of the process are taken forward as effectively as possible.

One of the authors is also a member of the Observatory staff team and they are responsible for supporting the other authors throughout the writing and production process. They consult closely with one another to ensure that all stages of the process are as effective as possible and that HiTs meet the series standard and can support both national decision-making and comparisons across countries.

9.3 The review process

This consists of three stages. Initially the text of the HiT is checked, reviewed and approved by the series editors of the European Observatory. It is then sent for review to two independent academic experts, and their comments and amendments are incorporated into the text, and modifications are made accordingly. The text is then submitted to the relevant ministry of health or appropriate authority, and policy-makers within those bodies are restricted to checking for factual errors within the HiT.

9.4 About the authors

Juliane Winkelmann is a Research Fellow in the Department of Health Care Management at the Berlin University of Technology and the Berlin hub of the European Observatory on Health Systems and Policies. She holds a Master's in Public Policy from Maastricht University and a postgraduate degree in Health Economics from the University of York.

Jesús Gómez Rossi is a Researcher at the Charité- Universitätsmedizin in the areas of dentistry, health economics and health services research. He is a dentist by training with a PhD in dentistry from Universidad Europea (Spain). He also holds a Master's degree in International Health Policy from the London School of Economics and Political Science.

Ewout van Ginneken is hub coordinator of the European Observatory on Health Systems and Policies, at the Berlin University of Technology. He holds a Master's degree in health sciences, health policy and administration from Maastricht University and a PhD in public health from the Berlin University of Technology.

The Health Systems in Transition Series

A series of the European Observatory on Health Systems and Policies

The Health Systems in Transition (HiT) country reports provide an analytical description of each health system and of reform initiatives in progress or under development. They aim to provide relevant comparative information to support policy-makers and analysts in the development of health systems and reforms in the countries of the WHO European Region and beyond.

The HiTs are building blocks that can be used:

- to learn in detail about different approaches to the financing, organization and delivery of health services;
- to describe accurately the process, content and implementation of health reform programmes;
- to highlight common challenges and areas that require more in-depth analysis; and
- to provide a tool for the dissemination of information on health systems and the exchange of experiences of reform strategies between policymakers and analysts in countries of the WHO European Region.

How to obtain a HiT

All HiTs are available as PDF files at eurohealthobservatory.who.int where you can also join our listserv for monthly updates of the activities of the European Observatory on Health Systems and Policies, including new HiTs, books in our co-published series with Cambridge University Press, Policy briefs, Policy Summaries, and the Eurohealth journal.

If you would like to order a paper copy of a HiT, please contact us at: contact@obs.who.int



The publications of the
European Observatory on
Health Systems and Policies
are available at
eurohealthobservatory.who.int

HiT Country Reviews Published to Date

Albania

(1999, 2002^{a,g})

Andorra

(2004)

Armenia

(2001^g, 2006, 2013)

Australia

(2002, 2006)

Austria

(2001^e, 2006^e, 2013^e, 2018)

Azerbaijan

(2004^g, 2010^g)

Belarus

(2008^g, 2013)

Belgium

(2000, 2007, 2010, 2020)

Bosnia and Herzegovina

(2002^g)

Bulgaria

(1999, 2003^b, 2007^g, 2012, 2018)

Canada

(2005, 2013^c, 2020)

Croatia

(1999, 2006, 2014, 2021)

Cyprus

(2004, 2012)

Czech Republic

(2000, 2005^g, 2009, 2015)

Denmark

(2001, 2007^g, 2012)

Estonia

(2000, 2004^{g,i}, 2008, 2013, 2018)

Finland

(2002, 2008, 2019)

France

(2004^{e,g}, 2010, 2015)

Georgia

(2002^g, 2009, 2017)

Germany

(2000^e, 2004^{e,g}, 2014^e, 2020)

Greece

(2010, 2017)

Hungary

(1999, 2004, 2011)

Iceland

(2003, 2014)

Ireland

(2009)

Israel

(2003, 2009, 2015)

Italy

(2001, 2009, 2014)

Japan

(2009)

Kazakhstan

(1999^g, 2007^g, 2012)

Kyrgyzstan

(2000^g, 2005^g, 2011^g)

Latvia

(2001, 2008, 2012, 2019)

Lithuania

(2000, 2013)

Luxembourg

(1999, 2015)

Malta

(1999, 2014, 2017)

Mexico

(2020)

Mongolia

(2007)

Netherlands

(2004^g, 2010, 2016)

New Zealand

(2001^{*})

North Macedonia

(2000, 2006, 2017)

Norway

(2000, 2006, 2013, 2020)

Poland

(1999, 2005^k, 2011, 2019)

Portugal

(1999, 2004, 2007, 2011, 2017)

Republic of Korea

(2009^{*})

Republic of Moldova

(2002^g, 2008^g, 2012)

Romania

(2000^f, 2008, 2016)

Russian Federation

(2003^g, 2011^g)

Serbia

(2019)

Slovakia

(2000, 2004, 2011, 2016)

Slovenia

(2002, 2009, 2016, 2021)

Spain

(2000^h, 2006, 2010, 2018)

Sweden

(2001, 2005, 2012)

Switzerland

(2000, 2015)

Tajikistan

(2000, 2010^g, 2016)

Turkey

(2002^{g,i}, 2011ⁱ)

Turkmenistan

(2000)

Ukraine

(2004^g, 2010^g, 2015)

United Kingdom of Great Britain and Northern Ireland

(1999^g, 2015, 2022)

United Kingdom (England)

(2011)

United Kingdom (Northern Ireland)

(2012)

United Kingdom (Scotland)

(2012)

United Kingdom (Wales)

(2012)

United States of America

(2013, 2020)

Uzbekistan

(2001^g, 2007^g, 2014^g)

Veneto Region, Italy

(2012)

All HiTs are available in English.

When noted, they are also available in other languages:

- ^a Albanian
- ^b Bulgarian
- ⁱ Estonian
- ^c French
- ^d Georgian
- ^e German
- ^k Polish
- ^f Romanian
- ^g Russian
- ^h Spanish
- ⁱ Turkish



**The publications of the
European Observatory
on Health Systems
and Policies
are available at**

<https://eurohealthobservatory.who.int/>





The Observatory is a partnership, hosted by WHO/Europe, which includes other international organizations (the European Commission); national and regional governments (Austria, Belgium, Finland, Ireland, Norway, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and the Veneto Region of Italy (with Agenas)); other health system organizations (the French National Union of Health Insurance Funds (UNCAM), the Health Foundation); and academia (the London School of Economics and Political Science (LSE) and the London School of Hygiene & Tropical Medicine (LSHTM)). The Observatory has a secretariat in Brussels and it has hubs in London (at LSE and LSHTM) and at the Berlin University of Technology.

HiTs are in-depth profiles of health systems and policies, produced using a standardized approach that allows comparison across countries. They provide facts, figures and analysis and highlight reform initiatives in progress.