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Dental Public Health Education in Europe: a survey of European Dental Schools to determine current practice and inform a core undergraduate programme

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Objective: Describe current Dental Public Health [DPH] curricula content and delivery across European dental schools and ascertain views on a core undergraduate curriculum for dental students. ***Research design***: Survey of European dental schools, informed by professional and academic literature and European Association for Dental Public Health [EADPH] Special Interest Working Group discussions. Questionnaires were distributed electronically, by post, and via EADPH network members, to the Deans of 252 dental schools in Europe. E-mail reminders were sent to non-responders. ***Setting***: European Dental Schools. ***Results***: Around half (n=124, 49%) out of a possible 252 schools responded, all of which reported having some DPH education. Two-thirds reported having a dedicated DPH department. Education was delivered by a variety of staff including those trained in paediatric and preventive dentistry. There were differing degrees of integration within the undergraduate programme and substantial variability in topics, teaching methods and approaches to assessment. Key components of the curriculum supported by respondents were: DPH philosophy and approach, population demography and health, health promotion and disease prevention, health care systems, the dental workforce and planning for health and oral health. Respondents were generally in favour of improving current teaching and shaping a core DPH curriculum for Europe. ***Conclusions***: Amongst those who completed the questionnaire, there was a general agreement on the need for a core Dental Public Health curriculum for European dentists. Given the variation across Europe, increased awareness and prioritisation of the subject is required, facilitated by collaborative support.

Keywords*: Education, epidemiology, European Union, undergraduates, dental health services*

Introduction

Over recent decades, dental education in Europe has benefited from greater collaboration and integration. The 1999 Bologna Declaration, signed by 29 European countries, outlined an ambition to establish more comparable and harmonised higher education systems across Europe. A DentEd Thematic Network was founded with the aim of identifying innovation, best practice, and areas in need of development in dental education in the European Union and support convergence (Delap and Brown, 2004). This work has been led through the Association for Dental Education in Europe (ADEE) (Cowpe *et al.*, 2010), established in 1975 (ADEE, 2019). Dental education requires at least five years of study in a programme that enables dentists to develop and demonstrate a basic level of knowledge, skills and professional behaviour necessary for general professional practice (European Parliament, 2005; Manogue *et al.*, 2010). Modern curricula have evolved along with a shift in philosophy towards prevention, developments in oral health monitoring and a focus on evidence-based practice (Chestnutt, 2016a; 2016b).

A document outlining the profiles and competences required by students before completion of the dental undergraduate course was produced in 2009 (Cowpe *et al.*, 2010) and updated in 2017 by ADEE. Whilst DPH, which emerged as a specialist discipline of dentistry during the 1990's (Gallagher, 2013), was not a specific domain, the seven domains included elements of DPH. ADEE welcomed a review of this subject area in advance of recent revisions (Field *et al*., 2017).

The pan-European specialist association, The European Association for Dental Public Health (EADPH), founded in 1996, is an international and independent science-based forum for professionals with a special interest in dental public health and community dentistry. Annual conferences are held across Europe and provide a platform for interaction between, and within, countries.

Within EADPH, a special interest working group for Dental Public Health Education was established, with the first meeting held in London in 2012. The working group convenes annually to explore common issues and share elements of good practice relating to DPH competencies, education and training. The group's first project was to undertake research to contribute to the revision of the 'Profile and competencies of the European Dentist'.

The objective of this study, conducted in collaboration with ADEE, was to describe current Dental Public Health curricula content and delivery across European dental schools and ascertain views on a core DPH curriculum for undergraduate dental students.

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Method

A European cross-sectional survey of dental schools was carried out using a questionnaire informed by available guidance documents including the ADEE *Profile and competences for the graduating European dentist* (Cowpe *et al.*, 2010) and the UK General Dental Council's (GDC, 2015) *Preparing for practice: dental team learning outcomes for registration*. The content of the survey was discussed at the EADPH meetings in Malta (2013) and Gothenburg (2014), and modified in line with feedback and current practice of schools. Face validity was checked, piloted and then re-checked through annual working group meetings. The list of agreed topic areas considered to be within the scope of DPH, represented a population health perspective, and was deemed relevant to a graduating dentist. Individual preventive care was considered to be primarily within the domain of clinicians. Questions exploring the detailed scope of DPH education involved topics currently taught, and what respondents considered should be taught, across six possible domains or topic areas (Table 2).

It was recognised that terminology used to describe population-based elements of dentistry varied across the continent. Given that Dental Public Health is also known as Community Dental Health and may in some countries be delivered through other specialties such as Paediatric Dentistry; this was acknowledged in the introduction to the questionnaire and covering letter.

The questionnaire covered current practice within the curriculum, and respondents' thoughts and plans for future delivery of DPH education. The final agreed questionnaire contained 53 closed and 5 open questions about the following topics in participants' dental schools:

- Year(s), within the undergraduate dental curriculum, that DPH was taught
- Lead department, and staff responsible, for teaching DPH
- Educational methods and materials used
- Core content across 6 domains: DPH philosophy and approach; population demography and health; health promotion and disease prevention; health systems; oral health workforce; planning for health
- Future plans for teaching DPH.

The questions were uploaded to an online survey platform, 'Qualtrics', which complies with ethical research guidelines. The King's College London Ethics Committee deemed the survey an audit of dental education, thus ethical approval was not required. A copy of the questionnaire is available online (https://www.eadph.org/course/dental-public-health-education).

A database of European dental schools was created *de novo* through publicly available web sites by one researcher [NR]. The list was verified via members of the EADPH at country level, as a result of which three further schools in Eastern Europe were added to the sample frame.

All European Dental Schools were invited to participate. The questionnaire was distributed to 252 schools during 2015/16. An approach letter with unique log-in details for completing the questionnaire online, together with a paper copy of the questionnaire, and information sheet regarding the study were sent to the Dean/Head of each dental school by both e-mail and post. Consent to use the data was implied by return of the questionnaire. The survey was approved by, and conducted in association with, ADEE and confirmed in the covering letter and information sheet. It was recommended that the questionnaire be completed by one member of staff with knowledge of current Dental Public Health within the school. In cases of duplicate responses, the more complete response was utilised.

Two reminder emails were sent to non-responding schools remaining on the circulation database in 2015/16 after 29 and 40 weeks. The second reminder advised that the survey was ending. EADPH members were asked to encourage replies from non-responding institutions.

The results from the online platform were combined with the emailed/ posted paper questionnaires. Simple frequency analyses were used to report responses to closed questions. Reponses to open questions were analysed thematically (Ritchie *et al*., 2013).

Results

In total, 134 replies were received, 63 on the Qualtrics software platform and 71 via a post, email or by hand at conferences. Following removal of 10 duplicates, the response rate was 49% (124 out of 252 schools). Six responses were incomplete; however, it was considered relevant to include all available data. Response rates were higher from Western Dental Schools (WDS) with 53% (76 out of 143) responding compared with 44% (48 out of 109) Eastern Dental Schools (EDS). One school actively declined participation, in writing.

Most responding schools (72%), reported having an undergraduate dental programme 5 years in length, the range being 4 – 6 years. DPH teaching was present in all programmes to some extent, with variation in its position in the curriculum and intensity of teaching. Just over half of the responding schools (56%) reported teaching DPH longitudinally. In total, 17 schools reported teaching this subject across all years of the curriculum, 15 of which were WDS.

Two-thirds of schools (66%) had a specific department or section dedicated to teaching DPH, under a variety of labels or disciplines. These departments were most commonly named: DPH, Preventive Dentistry, Community Dentistry and Community Dental Health and, where the former did not exist, 'Paediatric Dentistry'. The various departments co-ordinating undergraduate teaching in DPH/ CDH included: Paediatric Dentistry (24%), Preventive Dentistry (21%), Public Health (17%), Restorative Dentistry (15%), Epidemiology (8%), Sociology (3%), and Periodontology (2%).

Departments delivering teaching were most commonly led by Professors (60% of those who answered that question) and Associate Professors (23%) whose specialty was DPH. Academics in DPH and Paediatric Dentistry were most commonly delivering teaching. Other staff supporting education were from a range of grades and disciplines including epidemiology, restorative dentistry, psychology, statistics and sociology (Table 1).

Whilst a wide range of teaching methods was reported, most schools (92%) used traditional means: primarily

Table 1. Disciplines of staff who teach DPH/ CDH elements in the undergraduate programme

Providers of DPH/CDH Teaching	*%*
Academics in Dental Public Health	15.7
Academics in Paediatric Dentistry	12.3
Epidemiologists	8.9
Specialists in Dental Public Health	9.2
Academics in Restorative Dentistry	7.6
Other Dentists	7.3
Academics in Public Health	6.6
Specialists in Paediatric Dentistry	6.6
Specialists in Restorative Dentistry	4.7
Psychologists	4.5
Statisticians	4.5
Other	4.5
Specialists in Public Health	4.2
Sociologists	3.4

lectures (28%), supplemented by seminars (17%), project work (12%), outreach visits (11%), tutorials (9%) and workshops (9%). Problem-based learning, debates and online tools were also reported, but less commonly so**.**

Schools almost equally used written assessments with multiple-choice questions (54%), essay questions (51%), coursework and assignments (48%). A minority (15%) reported other methods including oral examinations and including DPH within Objective Structured Clinical Examinations (OSCEs).

There was greatest coverage of, and support for, three of the six domains identified by the working group namely: epidemiology; population health; and, health promotion and disease prevention (Table 2). Less well covered were the domains relating to planning for health, healthcare systems and the oral and dental workforce. It was interesting to note that topics such as the wider public health workforce, dental leadership, and theory of planning, although not well covered currently were considered more important for the future.

Of the 48 EDS and 76 WDS responding to an open question regarding their plans for development of undergraduate DPH at their school, all EDS indicated that they would change their teaching whilst 68 of the WDS also anticipated a change and the remaining 8 WDS did not anticipate one. All of the latter had established departments/curricula, kept their curriculum under review/ had already made changes, or had insufficient staff for further expansion.

Comments included intentions of 'integration of DPH principles throughout the whole course', 'revision of the content'; through to delivering the curriculum through 'community outreach'. In support of proposed change, there were plans for 'further training of clinical staff', 'more contact with specific population groups', and 'linking more clinical disciplines through our work on being a more Health Promoting Dental Institute'.

Responses to open questions were generally positive in regard to shaping a core DPH curriculum.

'*We agree with a core DPH curriculum for Europe',* [EDS teaching DPH as part of 'Community and Preventive Dentistry' over two years in the Department of Paediatric Dentistry]

'I am in agreement that a core DPH curriculum is organised - this will better streamline Europe's policies and approach to topic'. [WDS teaching DPH in the Department of Oral Rehabilitation and Community Care' over three years.]

Only one school appeared not to support it as a priority, highlighting pressures in the curriculum as outlined below by a WDS teaching DPH as part of Operative and Preventive Dentistry across three years:

'Interesting, but there are many new developments in dentistry which are considered to be implemented in the curriculum and we don't want to further inflate the curriculum. Our principle is: If new topics are implemented, some others have to be removed'.

A small minority highlighted the challenge of delivering DPH education, including the lack of teaching capacity and congested curricula. It was also expressed that increasing teaching in DPH, or 'inflating' the curriculum as mentioned above, may require sacrificing other course elements.

Almost half of the schools provided examples of good practice, commonly citing outreach placements and health promotion/preventive programmes as examples they would like to share. Such initiatives were perceived as vehicles for direct health promotion in society. Specific examples included 'brief intervention training' for tobacco cessation, 'leadership in dentistry' and sending students to observe or partake in health promoting activities in settings such as schools or nursing homes.

Discussion

The study provides an important insight into the delivery of DPH education in Europe, revealing that a *population perspective* is included in the curricula of the responding schools and taught by a variety of departments and disciplines. There is clear support for creating a core curriculum, with congruence on suggested domains and topics, together with examples of good practice. To the knowledge of the authors, this is the first survey to explore DPH education across Europe. The findings represent an important milestone in undergraduate education and have been endorsed by ADEE through the creation of Domain IV *Dentists in Society* (Gallagher and Field, 2017).

The findings provide insight as to how DPH fits into existing curricula. Two-thirds of the participating schools had a specific department or section dedicated to teaching DPH. There was evidence of multidisciplinary teaching with individuals from public health, epidemiology, sociology, psychology and law. Almost one third of schools lacked a dedicated department; however, organisational structures in universities vary and it is not necessarily required to have a department with the same name as long as the domains are part of the curriculum. There is evidence that DPH is taught longitudinally in many schools, which suggests it is embedded across the programme. This is in line with the ADEE (2017) recommendation that competences should support integration of all disciplines. The lack of

Table 2. DPH curriculum in Europe: current and future

	Is this topic taught in your dental school? %			*Should this topic be included in the DPH curriculum in Europe?* %		
Dental Public Health Subjects	*Yes*	*No*	*Don't know*	*Yes*	*No*	*Don't know*
Dental Public Health philosophy and approach	86	8	6	95	1	4
Population demography and health	90	7	3	94	1	5
Health promotion and disease prevention	97	2	1	98	1	1
Healthcare systems	83	16	1	92	3	5
The oral and dental workforce	76	16	8	83	7	10
Planning for health and oral health	87	8	5	91	2	7
1. Dental Public Health Philosophy and Approach	*Yes*	*No*	*Don't know*	*Yes*	*No*	*Don't know*
Definitions of Dental Public Health	94	4	2	98	0	2
Public Health approach and skills	89	7	4	95	0	5
Consideration of diseases which are public health Problems	90	7	3	94	2	4
2. Population Demography and Health	*Yes*	*No*	*Don't know*	*Yes*	*No*	*Don't know*
Epidemiology of oral disease	96	4	0	97	0	3
Epidemiological tools and indicators	97	3	0	98	0	2
Oral health needs assessment	89	9	2	93	1	6
National oral health trends	88	8	4	96	0	4
Demographic trends	85	12	3	89	3	8
Social trends	79	14	7	90	3	7
Inequalities in health	82	10	8	97	1	2
Global oral health trends	72	19	9	93	2	5
3. Health Promotion and Disease Prevention	*Yes*	*No*	*Don't know*	*Yes*	*No*	*Don't know*
Concepts and definition of health	95	4	1	96	0	4
Determinants of health	92	4	4	96	0	4
Evidence base for health promotion	87	10	3	96	1	3
Behaviour change	83	12	5	92	4	4
4. Healthcare Systems	*Yes*	*No*	*Don't know*	*Yes*	*No*	*Don't know*
Organisation and delivery of public and private dental care	82	15	3	92	4	4
Infection control	80	16	4	84	9	7
Evidence based health care	79	17	4	90	3	7
Oral health policies	76	18	6	91	2	7
Organisation and delivery of healthcare in general	72	24	4	88	5	7
Relevant health policy	72	23	5	89	1	10
Equity of care	68	22	10	88	2	10
Remuneration and payment systems	62	28	10	80	7	13
Examples of changes in health services	56	31	13	82	6	12
5. The Oral and Dental Workforce	*Yes*	*No*	*Don't know*	*Yes*	*No*	*Don't know*
Roles and responsibilities within dental team	79	16	5	92	3	5
Dental workforce overview	70	23	7	92	2	6
Dental leadership	56	34	10	83	5	12
The wider public health workforce	46	43	11	79	8	13
6. Planning for Health	*Yes*	*No*	*Don't know*	*Yes*	*No*	*Don't know*
Examples of effective public health interventions	81	16	3	93	1	6
Planning oral health promotion	80	19	1	97	2	1
Planning oral and dental services	70	26	4	91	3	6
Theory of planning	53	36	11	79	5	16

universal support for this approach was recognised and can be for a variety of reasons from philosophical to practical. None-the-less, it will be important to support embedding the core elements of DPH and good practice whatever the time commitment.

Six topic areas were identified in the EADPH workshops and tested in the study. These are essentially in line with those for DPH specialists (Weintraub, 1998) and public health professionals (Bjegovic-Mikanovic *et al.*, 2013; Otok and Foldspang, 2016). The findings suggest generally good coverage of the philosophy and principles of DPH and less emphasis on policies, systems, and services. Given the freedom of movement of health professionals and diversity of systems in much of Europe (Widstrom and Eaton, 2004; Ziller *et al.*, 2015), there is an argument to support deeper understanding of systems. There seems to be less importance placed on subjects relating to the workforce and leadership within health systems and organisations, for graduate dentists; subjects which are reflected in published national guidance (GDC, 2015). Health systems impact on dentists role in society and our future graduates will require cultural competence to work effectively in society (Gallagher and Field, 2017).

'Dentists in society', informed by this research, is now recognised as one of four domains for DPH education by ADEE (2017); this has implications for all schools globally that follow the ADEE profile. Institutions will need to update their curricula and the EADPH working group, together with ADEE, should play an active role in supporting this process through staff training and support and collaboration using innovative methods of teaching (Field *et al.*, 2017). Going forward, members should support one another to improve the quality of the syllabus, drawing on available texts (Chestnutt, 2016a; Pine and Harris, 2007; Daly *et al.*, 2013) and examples of good practice. Whilst political changes may alter the makeup of the EU/EAA (UK Government, 2019), it is clear that universities and professions have an important role in developing quality standards, which is enhanced through collaboration and debate.

It has been suggested that outreach training can give students a greater appreciation of the social determinants of health (Nandakumar and Robinson, 2011); with outreach visits identified as a vehicle for integration into society and a focus on the social determinants of health. Furthermore, improving the oral health of individuals, families and groups in the community is an important competence, within the findings, suggesting that outreach programmes can help students to do so.

The often-unspoken problem, explored by educators at successive working group meetings is the frustration that many students do not see the relevance of DPH until they have qualified, thus DPH can be considered a less attractive element within the curriculum. Creative ways of delivering the curriculum must be sought as an imperative to enable students to really engage with a population perspective and Domain IV provides a platform for change (Field *et al.*, 2017; Gallagher and Field, 2017). The diversity in working with other countries brings richness, enabling sharing and debate of ideas. This will help in developing our university/school-specific curricula and will strengthen undergraduate teaching.

The strength of this study is its method, based on the EADPH's education SWIG activities, and involving its members. However, a number of limitations must be acknowledged. First, the educational institutions were identified by manual online search, due to absence of an official contemporaneous list, which could have affected the accuracy of the database and the response rate (e.g. the questionnaire may not have reached or been forwarded to the appropriate person); none-the-less every effort was taken to identify relevant institutions through EADPH members in Europe. Moving forward, given the importance of education in Europe, it would be helpful for ADEE, with the relevant permissions in place, to provide a website with all dental school institutions across Europe. Second, response bias, given that schools with an established interest in DPH may have been more likely to respond and participate, and demonstrate support for DPH education; and whilst, reasons for non-response are many and varied, including low interest/relevance of the subject and other pressures (Dillman, 2011), it is reasonable to assume that schools without established DPH components were less likely to participate. With just under half Europe's dental schools participating, the need for further raising awareness of DPH education is highlighted. None-the-less findings provide an insight to the current values and practices in relation to DPH education across Europe, as demonstrated by the differences between EDS and WDS, with overall support for the core topics identified by the working group and collected examples of good practice, all of which has informed a regional perspective on the graduating dentist (Field *et al*., 2017). The enormity of this challenge must not be underestimated, but the opportunity seized.

Conclusion

Amongst those who completed the questionnaire, there was clear support for DPH with a core curriculum in Europe. There was agreement on key domains, with responding schools demonstrating evidence of engagement with a population perspective and examples of good practice. Development of educational curricula in some schools may require support and there is a clear opportunity to raise the profile of DPH education and take this forward working with the ADEE as well as EADPH.

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