CHAPTER CONTENTS

Introduction
Definition of dental public health
Relevance of public health to clinical practice
What is a public health problem?
Public health movement: history and background
Emergence of the new public health
Alma-Ata declaration

Ottawa Charter
Millennium development goals
WHO Commission on the Social Determinants of Health
Core themes of dental public health practice
Implications of dental public health for practice, research, and teaching
References
Further reading

By the end of this chapter you should be able to:

● Define dental public health.
● Identify the links between clinical practice and dental public health.
● Outline the criteria used to determine if a condition is a public health problem.
● Describe the central arguments presented by the critiques of the biomedical approach to health care delivery.

This chapter links with:

● All the other sections in this text by providing the background to dental public health.

Introduction

Public health is now recognized as being a core component of the undergraduate medical and dental curricula in many parts of the world (Association for Dental Education in Europe 2010; General Dental Council 2011; General Medical Council 2009). This recognition acknowledges that public health is an important subject relevant to the practice of medicine and dentistry. This chapter will outline what is meant by public health and, in particular, its relevance to clinical dental practice. The philosophical and historical background of public health will be reviewed and the limitations of the traditional system of health care highlighted. Finally, a dental public health framework will be outlined to highlight the central importance of public health to the future development of dentistry.
Definition of dental public health

Dental public health can be defined as the science and practice of preventing oral diseases, promoting oral health, and improving quality of life through the organized efforts of society.

The science of dental public health is concerned with making a diagnosis of a population’s oral health problems, establishing the causes and effects of those problems, and planning effective interventions. The practice of dental public health is to create and use opportunities to implement effective solutions to population oral health and health care problems (Chappel et al. 1996).

Dental public health is concerned with promoting the health of the population and therefore focuses action at a community level. This is in contrast to clinical practice which operates at an individual level. However, the different stages of clinical and public health practice are broadly similar (Table 1.1).

Dental public health is a broad subject that seeks to expand the focus and understanding of the dental profession on the range of factors that influence oral health and the most effective means of preventing and treating oral health problems. Dental public health is underpinned by a range of related disciplines and sciences that collectively enrich the value and relevance of the subject (Box 1.1).

Relevance of public health to clinical practice

The practice of dentistry is undergoing a period of rapid change due to a wide range of factors in society (Box 1.2). The knowledge and skills required for the

<table>
<thead>
<tr>
<th>Individual clinical practice</th>
<th>Public health practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination</td>
<td>Assessment of need</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Analysis of data</td>
</tr>
<tr>
<td>Treatment planning</td>
<td>Programme planning</td>
</tr>
<tr>
<td>Informed consent for treatment</td>
<td>Ethics and planning</td>
</tr>
<tr>
<td>An appropriate mix of care, cure, and prevention</td>
<td>Programme implementation</td>
</tr>
<tr>
<td>Payment for services</td>
<td>Types of finance</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Appraisal and review</td>
</tr>
</tbody>
</table>

Modified from Young and Striffler 1969.

Box 1.1 Sciences and disciplines underpinning dental public health

- Epidemiology
- Health promotion
- Medical statistics
- Sociology and psychology
- Health economics
- Health services management and planning
- Evidence-based practice
- Demography

Box 1.2 Changes affecting the practice of dentistry

Epidemiological changes Changing pattern of disease; for example, dramatic improvements in caries, persistence of oral health inequalities.

Demographic shifts Ageing population, changes in family structures, greater population mobility, increasing cultural diversity.

Organizational changes Health service reforms, greater emphasis on primary care services and prevention, evidence-based medicine/dentistry, corporate bodies, clinical governance.

Professional development Importance of life-long learning, team work, interpersonal skills.

Social change Consumerism, increasing public expectations and demands on health services, widening social and economic inequalities.

Political pressures Changes to the welfare state, pressures for cost containment on public spending, rationing care, increasing professional accountability.

Technological change Health informatics, pharmaceutical developments, ‘new genetics’, new dental materials.
next generation of dental professionals will therefore be very different than was previously the case.

Studying dental public health provides an ideal opportunity to gain an improved understanding of many of the factors outlined in Box 1.2. Three key areas are most relevant to the practice of clinical dentistry, as detailed in the following sections.

Epidemiology of oral diseases
It is essential that dental services are developed to address and effectively meet the oral health needs of individuals and the wider community. Knowledge of the epidemiology of oral disease will facilitate an understanding of the extent, aetiology, natural history, and impacts of oral conditions. By applying critical appraisal skills in their clinical decision-making, dental professionals can practice dentistry more effectively through an evidence-based approach to care. Clinical epidemiology provides the skills required to undertake this task by teaching the principles of study design and evaluation.

Prevention and oral health promotion
Prevention is as pivotal to the dentist’s role as treatment of disease. A core aspect of dental public health is exploring the principles of prevention and oral health promotion and identifying opportunities for effective preventive interventions. This requires an understanding of the social, political, economic, and environmental factors that influence oral health and the capacity of dentistry to influence them. Of particular importance to oral health is a broad understanding of diet and nutrition, body hygiene, tobacco use, and the use of fluorides in the prevention of dental caries, periodontal disease, and oral cancers.

Planning and management of health services
Dental services are a part of the health care system and are affected by many of the complex organizational and policy developments of the wider health, social, and welfare systems. It is essential that dental professionals have a broad understanding of the changing structure, organization, and finance of their health care system. This knowledge will enable dentists to plan and develop their dental practices more effectively.

What is a public health problem?
It is now widely recognized that demands on health care systems will always be greater than the resources available to meet these needs. This dilemma is not confined to the developing world where resources are acutely limited. The richest countries in the world, such as the USA, Germany, and the UK, are faced with similar problems of increasing demands and escalating health care expenditure. For example, expenditure on health care in the USA rose from 5.1% of gross domestic product in 1960 to 17.6% in 2010 (OECD 2012). Across the OECD, the average expenditure on health care is now 9.6%. In the UK, spending on the General Dental Services has risen steadily over recent decades. In 1977/78 the figure was £270 million, by 1997/98 it was £1528 million, and in 2012 it was estimated to be in excess of £3.3 billion.

One response to increasing demands and limited resources is to direct resources to particular priority areas. However, what would be considered an important problem? This is where core public health principles have a major contribution to make. Box 1.3 lists certain public health criteria that can be used to determine the significance of a health problem (Sheiham 1996).

The first criterion relates to the prevalence of the health problem, in essence is the disease widespread? Who has the disease? What percentage of the total
population is affected? What is the distribution of the disease within the community? Is the prevalence of the condition increasing or decreasing? The second aspect relates to the impact of the condition at the individual level. How severe are the effects of the disease to the patient? For example, do people die as a result of it? Do they suffer pain, discomfort, or loss of function? Can they perform their normal social roles? Are they prevented from going to school or becoming employed because of the problem? The third aspect relates to the effects of the disease across society. What are the costs to the health service of treating the condition? How much time do people take off work to get treatment and care? What effect does the condition have on economic performance and productivity of the country? Figure 1.1 presents a summary of the impact of oral conditions on the individual and society. Finally, it is important to consider the potential for prevention and treatment of the disease. Is the natural history of the disease fully understood? Can the early stages of the condition be recognized? If so, are there interventions that can be implemented to stop the disease progressing? If it does progress, are there effective treatments available?

Box 1.3 Criteria for a public health problem

- Prevalence of the condition.
- Impact of the condition on an individual level.
- Impact on wider society.
- Condition is preventable and effective treatments are available.

**DISCUSSION POINTS 2**
Apply the criteria from Box 1.3 to dental caries, periodontal disease, and malocclusion.
Do you consider these oral health conditions are dental public health problems?
Explain the basis for your answer.

Public health movement: history and background

Public health is not a new subject. Indeed, it has a long and interesting history, which is linked to many of the social, economic, and political changes that have
occurred in history in the last 150 years. The public health movement originally arose in response to the appalling living and working conditions that affected a high proportion of the working classes in the industrialized world in the 19th century. Rapid industrialization and urban growth created industrial towns and cities in which overcrowding, extreme poverty, squalor, and disease were commonplace. Pioneering social reformers such as Southwood Smith, Edwin Chadwick, and John Snow identified the need to improve the living and working conditions of the poor to promote the public health. In the UK, municipal reforms and improvements in the environment then resulted from passing legislation such as the Public Health Act 1875.

One example of this early public health approach to dealing with disease is the response to a cholera outbreak in Soho, London, in 1875. John Snow, a local doctor, identified that cholera was a waterborne disease by mapping the outbreak to a single water source, a water pump in Broad Street. By removing the pump handle, the epidemic was controlled as no one could then access the infected water source (Figure 1.2). This is an example of public health practice in action: an epidemiological assessment of the problem, identification of the environmental cause of the infection, and implementation of effective action, cheaply and quickly.

**DISCUSSION POINTS 3**

- If John Snow had not been in Soho, how would this cholera outbreak have been dealt with by his less enlightened colleagues?
- What would have been the obvious limitations of this approach?

Public health reforms that focused upon improving environmental conditions which significantly boosted the health of the poor in Victorian and Edwardian Europe.

![Figure 1.2](image-url)
were not simply driven by altruistic motives. The need for a fit and healthy workforce and armed services was the main pressure for reform. A significant proportion of British army recruits for the Boer War were rejected on health grounds, many of them because of dental problems. It was reported that 6% of potential recruits were rejected because of missing or decayed teeth, and within 3 months of enlisting, 3 in every 1,000 soldiers were declared unfit because of dental problems (Gelbier 1994).

The industrial revolution and the development of mechanization influenced emerging ideas about health and disease. The lessons of the public health movement were overtaken by the growth of knowledge about the functioning of the body and the analogy of the body with machines. The engineering concept was easy to explain to lay people, but it focused health interventions on the individual rather than the population level. This approach became known as the biomedical model of health. Features of the biomedical model are presented in Box 1.4.

By the turn of the 20th century the focus of public health had shifted away from social and environmental causes of disease to a more biomedical approach, which instead emphasized behavioural lifestyle and biological influences on health. This approach therefore became dominated by a more medicalized form of practice in which immunization and screening programmes had the highest priority and were the major focus for prevention.

Box 1.4 Features of the biomedical model

- Disease orientated, with a focus on pathological change.
- Explanations for ill health concentrate on biological factors, operating at an individual level.
- Knowledge and expertise controlled by the medical profession.
- Compartmentalized and mechanistic approach to diagnosis and treatment.
- Interventionist and high-technology approach to treatment—belief in 'magic bullets'.
- ‘Top-down’ approach—hierarchical structure.
- Centralized institutional centres of excellence—teaching hospitals.

Emergence of the new public health

In the UK, following the creation of the NHS in 1948, the health service steadily expanded in size and influence. Indeed, in most developed countries, health services expanded considerably in the second half of the 20th century. However, by the 1970s and 1980s the limitations of modern medicine were becoming increasingly evident. Medicine continued to adopt a treatment-orientated approach, but a number of other problems also emerged: health services did not appear to have any clear goals and were poorly evaluated, accountability was poor, and there was maldistribution of resources and inequality in the access and quality of health care. (The problems with health care systems will be covered in more detail in Chapter 23.)

DISCUSSION POINTS 4
Do you think these problems of health care delivery are applicable to the current health system?
Can you give some examples?

The limitations of modern medicine were highlighted by a selection of influential philosophers and academicians whose criticisms of the current system of health care were very important in establishing the new public health movement. A synthesis of their main arguments is presented in Box 1.5.

The new public health movement has refocused attention on to the political, economic, and environmental influences on health within contemporary society. More emphasis is therefore placed upon developing a range of policy options to create a more health-promoting environment. This development requires health professionals to work collaboratively with a wide range of sectors and agencies. The improvement in health is largely dependent upon activities outside of the health services. This presents a major challenge to traditional beliefs of the role of medicine in society. A number of international reports and WHO declarations embodied the new public health approach and the refocusing on primary health care.
Chapter 1  Introduction to the principles of public health

Alma-Ata declaration

In 1978, the World Health Organization organized an international conference in Alma-Ata in the then Soviet Republic of Kazakhstan to review the future development of health care internationally (WHO 1978). The conference agreed an important declaration that has since set an agenda for the new public health:

Focus on prevention  A shift in focus and resources is required, away from the dominant concentration on treatment towards prevention and what we now term as health promotion.

Multi-sectoral approach  The promotion of health requires action in a wide range of sectors beyond the health sector. Education, agriculture,
transport, economic, housing, and welfare policies all affect health.

**Appropriate technology** Emphasis should be placed upon the most appropriate technology and personnel to deal with health problems.

**Equitable distribution** Governments and health planners must endeavour to fairly distribute those factors that influence health.

**Community participation** Individuals and communities should participate in all decisions that affect their health.

These concepts are fundamental to the core themes in dental public health practice.

---

**Ottawa Charter**

The first WHO international health promotion conference was held in Ottawa, Canada, in 1986 to review the concepts and principles of health promotion (WHO 1986). This was a significant and fundamental turning point in global health promotion policy. The Ottawa Charter remains the seminal guidance document on health promotion. The Ottawa Charter identifies three basic strategies for health promotion. These are advocacy for health to create the essential conditions for health; enabling all people to achieve their full health potential; and mediating between the different interests in society in the pursuit of health. These strategies are supported by five priority action areas as outlined for health promotion:

1. **Build healthy public policy**: focusing attention on the impact on health of public policies from all different sectors, and not just the health sector

2. **Create supportive environments for health**: recognizing the impact of the social, physical, and political environment on health and identifying opportunities to make changes conducive to health

3. **Strengthen community action for health**: empowering individuals, families, and communities to take action to promote health and reduce inequalities

4. **Develop personal skills**: moving beyond the transmission of information, to promote understanding and health literacy, through the development of personal, social, and political skills that enable individuals to take action to promote health

5. **Reorient health services**: refocusing attention away from only providing curative and clinical services towards the broader goal of health improvement and disease prevention.

---

**Millennium development goals**

The aim of the millennium development goals is to encourage development by improving social and economic conditions in the world’s poorest countries (UN 2000). Established in 2000 at the Millennium Summit, all 193 United Nation member states and over 20 international organizations have now agreed to meet eight international development goals by 2015.

The goals are:

1. **Eradicating extreme poverty and hunger**
2. **Achieving universal primary education**
3. **Promoting gender equality and empowering women**
4. **Reducing child mortality rates**
5. **Improving maternal health**
6. **Combating HIV/AIDS, malaria, and other diseases**
7. **Ensuring environmental sustainability**
8. **Developing a global partnership for development**

---

**WHO Commission on the Social Determinants of Health**

In recognition of the growing concern over inequalities in population health, the WHO has coordinated global action to tackle this major problem. In 2008 the WHO published the final report on the Commission on the Social Determinants of Health (CSDH) which outlined a range of local, national, and international
policy initiatives to reduce health inequalities (WHO 2008). The report highlighted that health inequalities are principally caused by social, economic, and political factors, known as the social determinants of health.

There are three principles of action outlined in the report:

1. **Improve the conditions of daily life**—the circumstances in which people are born, grow, live, work, and age.

2. **Tackle the inequitable distribution of power, money, and resources**—the structural drivers of those conditions of daily life—globally, nationally, and locally.

3. **Measure and understand the problem**—evaluate action, expand the knowledge base, develop a workforce that is trained in the social determinants of health, and raise public awareness of the underlying causes of health inequality.

### Core themes of dental public health practice

Dental public health is a fundamental subject for dental students to study, but, unlike the majority of subjects in the dental curriculum, dental public health aims to broaden students’ focus and encourage a critical and questioning approach to the delivery of dental care. This approach is based upon understanding and applying core public health themes to the delivery of dental care. These themes are now discussed.

### Concepts of health

As health professionals, it is important that dentists have a clear understanding of what is meant by oral health. What dimensions would be included within a definition of oral health? Professional and public concepts may differ over the meaning and selected priorities. This may have important implications for the focus of dental services, goals, and priorities set, and the best process of evaluating interventions.

### Determinants of health

To promote and maintain oral health, it is essential that the factors that determine the health status of individuals and populations are clearly identified and the appropriate action implemented. Public health research and policy analysis has highlighted the significance of social, economic, and environmental factors in determining health status, and the need to work collaboratively with the range of sectors that influence these factors. At the root of understanding the socio-environmental determinants is the practical concept that, in order to change people’s behaviour, one has to change the environment.

### Concepts of need

One of the greatest challenges facing health care systems internationally is meeting the health needs of their populations with the available resources. This complex political and clinical problem has first to consider how to define need. Bradshaw (1972) has developed a taxonomy that distinguishes four types of need:

- **Normative needs** These are defined by professionals, based upon an assessment against an agreed set of criteria.

- **Felt needs** These are the needs that people perceive as being important. They are subjective feelings of what people really want.

- **Expressed needs** These arise from felt needs but are expressed in words or action and therefore become demands. People express a need when they ask for information or when they use services.

- **Comparative needs** This is when an individual or group is compared with a similar individual or group and is considered lacking with regards to services or resources.

### Inequalities in oral health

Within any given population, health will vary for a variety of reasons. Some health differences may be considered acceptable when they are seen as being inevitable
consequences of age or sex differences. Other health differences are caused by social, economic, and political factors which may affect certain members of society more than others purely based upon opportunity and access to appropriate resources within society. These health inequalities are now considered as unjust, unfair, and unacceptable (WHO 2008). The epidemiology of dental diseases reveals that disease levels vary greatly across socio-economic groups (Locker 2000; Petersen et al. 2005). What can dentists do to reduce oral health inequalities? One of the key challenges to dental public health is implementing effective strategies to do just this.

Preventive approach

Although ‘prevention is better than cure’, in reality prevention is given far less priority than the treatment of existing disease. Public health, however, seeks to develop effective preventive measures at both individual and population levels. Effective prevention requires an understanding of the key influences on health and identifying opportunities for appropriate intervention.

Quality of dental care

Although oral health is determined by a wide range of factors beyond purely contact with dental services, it is still important that high-quality dental services are developed to best meet the needs of their local populations. From a dental public health perspective, quality of dental care encompasses a range of issues beyond solely clinical concerns. Issues such as access to care, responsiveness to individuals’ concerns, and cost effectiveness all need to be addressed. Dental public health principles are relevant to clinical governance activities which encompass evidence-based dentistry.

Evidence-based practice

A core component of quality is the effectiveness of care. Evidence-based practice is central to clinical practice, and all clinical decisions should be based upon a critical appraisal of the available scientific evidence. Studying clinical epidemiology provides the understanding and skills to develop evidence-based practice.

Implications of dental public health for practice, research, and teaching

Around the world, governments have placed public health at the centre of their health strategy. Policies aimed at reducing health inequalities and addressing the social, economic, and environmental determinants of health are being developed and implemented. This public health agenda will directly impact upon the future development of dental services.

Dental public health is relevant to all aspects of clinical dental care, from the assessment of need, through the development of care, to the evaluation of treatment. The following chapters will introduce and explore the range of topics that are key elements of this subject.

References


**Further reading**

